PD-ABT-222
108283

5-13 Trinity Street, London SE1 1DB
Telephone: [44] 020 7378 4888
Telefax: [44] 020 7378 4899
E-mail: hq@merlin.org.uk

Continuation of Emergency Medical and Nutritional Support Sierra Leone

OFDA FINAL REPORT

February 2001

I. EXECUTIVE SUMMARY 3

II. PROGRAM OVERVIEW 4

A. Goals and objectives 4

B. Profile of Targeted Populations and Needs Identified 5

C. Geographical locations of major program activities 6

III. PROGRAMME PERFORMANCE 7

A. Program Performance Vis-À-Vis Objectives 7

B. Positive Effects Of Program On Target Populations 20

C. Effect On Overall Program Performace Of Unforeseen Circumstances 20

IV. RESOURCE USE / EXPENDITURES 21

I. EXECUTIVE SUMMARY

Organisation:	Medical Emergency Relief International (Merlin)
Mailing Address:	5-13 Trinity Street, London SE1 1DB
Date:	November 2000
Contacts:	Paul Foreman (Operations Manager for West Africa/East Timor)
	Jane Moore (Health Advisor)
Telephone:	(44) 020 7378 4888
Fax:	(44) 020 7378 4899
Email Address:	hq@merlin.org.uk

Programme Title: Continuation of emergency medical and nutritional support in the eastern and western regions.
Country: Sierra Leone
Disaster: Civil war
Area of activity: Kenema town and district, western part of Kailahun district, Freetown town and district, western part of Port Loko district.
Period of activity: 5 months (01 July 2000 – 01 December 2000)
Total number of beneficiaries: 1,000,000

Summary of activities undertaken and progress made in reporting period:

Since July 1999, Merlin has provided quality emergency health care to the resident and displaced populations in Kenema town and district, where Merlin also worked closely with the Ministry of Health (MoH) and other health and nutrition agencies. There have been dramatic and encouraging improvements in the nutrition and health status of the population, particularly of children and lactating and pregnant women. However, the MoH, particularly in Kenema district, continues to rely upon Merlin, particularly its organisational capacity, training of health staff, support through supervision at the peripheral health units (PHU) and building capacity with, and of, all national staff.

Together with OFDA Merlin has addressed many challenging issues through a diverse programme designed to increase the overall capacity of the MoH and communities for stability and sustainability, whilst maintaining Merlin's capacity to respond to emergency needs as a result of disease outbreak or mass population movements.

OBJECTIVE # 1:
Improve health status of the resident, displaced and returned populations in Kenema Town and district, in the western part of Kailahun district around, Freetown and western Port Loko district through the provision of emergency health care.

Targeted population:
- Displaced population Kenema district 50,000 in camps
- Displaced population eastern Freetown 250,000
- Refugee population originally from Kenema district 28,000 (potentially returnees)
- Refugee population originally from western Kailahun district 50,000 (potentially returnees)
- Resident population Freetown and western Port Loko district 1,000,000 incl. 200,000 under 5 years old
- Resident population Kenema district 300,000
- Resident population western part of Kailahun district 100,000 (estimate)

OBJECTIVE # 2:
Reduce incidence of morbidity and mortality associated with malnutrition among the vulnerable displaced, resident and returned population of Kenema Town and district through provision of emergency nutritional support.

Targeted population: Vulnerable population, resident, displaced and returnees in Kenema town and district, particularly children under 5.

II. PROGRAM OVERVIEW

A. GOALS AND OBJECTIVES

Objective 1
Improve health status of the resident, displaced and returned populations in Kenema Town and district, in the western part of Kailahun district around, Freetown and western Port Loko district through the provision of emergency health care.

Sub-Objective 1
- Access to quality emergency paediatric and maternity hospitalisation, plus outpatient services for the population in Freetown.

Sub-Objective 2
- Access to quality preventative and curative health care for displaced and/or returnee populations increased in eastern suburbs of Freetown, surrounding villages and Newton camp.

Sub-Objective 3
- Health information systems in all Merlin supported health facilitated in health facilities in Freetown and Kenema are improved and strengthened throughout the programme period.

Sub-Objective 4
- Merlin's capacity to appropriately respond to diarrhoeal and vaccine preventable disease outbreaks in Freetown maintained.

Sub-Objective 5
- Access to quality basic preventative and curative health care for war affected and displaced populations in Kenema Town and District maintained

Sub-Objective 6
- Access to quality basic preventative and curative health care for war affected and returned populations in the western part of Kailahun district increased

Sub-Objective 7
- Merlin's capacity to appropriately respond to disease outbreaks and/or additional trauma cases in Kenema district and western part of Kailahun district increased.

Objective 2
Reduce incidence of morbidity and mortality associated with malnutrition among the vulnerable, displaced, resident and returned population of Kenema Town and district through provision of emergency nutritional support.

Sub-Objective 1
- Prevalence of moderate and severe malnutrition among children under five **reduced maintained below** 10% and 1% respectively.

Sub-Objective 2
- Nutritional surveillance of the under five population in Kenema town and district maintained.

B. PROFILE OF TARGETED POPULATIONS AND NEEDS IDENTIFIED

The Target population figures listed under the objectives above were those estimated at the beginning of the programme period. The following are the most recent figures based on a series of surveys and censuses undertaken by Merlin/Ministry of Health staff.

Table #1: Target population for Merlin supported PHUs

PHU	Total pop	0-59mths	0-12mths	WCB age
Baama	11051	1649	442	2646
Blama	20640	3990	826	5621
Doujou	4131	985	165	1096
Falla	5300			
Foindu	10250			
Kondorma	6700			
Nekabo	10126	3260	405	2794
Largo	12151	1778	486	3051
Levuma	15,500			
Mondema	7051	1285	282	1708
Tungie	6922	1133	277	1614
TOTAL	**54,466**			

Table #2: Estimated target group population for Kenema District by chiefdom

Chiefdom	Total pop	0-59mths	0-12mths	WCB age
Nongowa*	**281705**	**47890**	**11268**	**67609**
Lower Bambara*	**49994**	**8499**	**2000**	**11999**
Gorama Mende*	**33694**	**5728**	**1348**	**8087**
Tunkia	27741	4716	1110	6658
Small Bo*	**32206**	**5475**	**1288**	**7729**
Dama	50282	8548	2011	12068
Gaura	15712	2671	628	3771
Wandor*	**18147**	**3085**	**726**	**4355**
Malegohun*	**8535**	**1451**	**341**	**2048**
Kanu Lepiamma*	**16287**	**2769**	**651**	**3909**
Simbaru	11271	1916	451	2705
Dodo*	**14971**	**2545**	**599**	**3593**
Koya	17165	2918	687	4120
Niawa	7624	1296	305	1830
Nomo	3176	540	127	762
Langrama	2041	347	82	490
Total	**590551**	**100394**	**23622**	**141732**
***Total Merlin PHU areas**	**455539**	**77442**	**18222**	**109329**

Table #3: Estimated population for Kenema IDP camps

IDP Camp	Estimated Total Populations
Lebanese *	102,408
Nyandeama*	10,357
Niawama	Approx. 4,500
Gofer*	1,016
Blama*	5,673
Konia	1,200

*Based on census data obtained prior to the nutritional survey in December

Table #4: Estimated target group population for the Freetown programme

	Total pop	0-59mths	0-12mths	WCB age
Freetown	1,000,000	164,000	40,000	240,000
Newton*:	39,064	6,041	1,563	9,375
Songo*:	30,788	5,234	1,232	7,389

* Based on census taken prior to emergency measles vaccination campaign undertaken by Merlin in April 2000.

GEOGRAPHICAL LOCATIONS OF MAJOR PROGRAM ACTIVITIES

Date: August 2000
Country: Sierra Leone

Admin 1	Admin 2	Place	Lat/ Long	Sector/ Activity	Start	End	Target Pop
Sierra Leone	Kenema District	Kenema District	7° 52'N 11° 10'W	Health/ nutrition	Whole programme period	Whole programme period	Recently displaced population in Kenema District
Sierra Leone	Kenema District	Kenema District	7° 52'N 11° 10'W	Health/ nutrition	Whole programme period	Whole programme period	Resident population in Kenema District
Sierra Leone	Freetown	Freetown	8° 29'N 13° 14'W	Health	Whole programme period	Whole programme period	Displaced and vulnerable resident population in Freetown

III. PROGRAMME PERFORMANCE

A. *PROGRAM PERFORMANCE VIS-À-VIS OBJECTIVES*

OBJECTIVE 1
Improve health status of the resident, displaced and returned populations in Kenema Town and district, in the western part of Kailahun district around Freetown and Western Port Loko district through the provision of emergency health care.

Sub-Objective 1
- Access to quality emergency paediatric and maternity hospitalisation, plus central accessible outpatient services increased for the population in Freetown.

Illustrative activities:
The numbers of patients seen in Macauley Street Satellite Clinic has however gradually increased throughout 2000. The general health status of children presenting is poorer particularly those recent arrivals from Makeni, Lunsar and Magburaka, many of whom have had no access to curative and preventative health care services, nor received routine immunisations.

Paediatric In-patients
The demand for paediatric beds at Macauley Street Satellite Clinic has continued with the maximum 50-bed capacity being maintained throughout the reporting period. The temporary in-patient structure was maintained at the clinic compound for a total capacity of 90 inpatients. However, its use has remained flexible as it is ideally suited to respond in the event of disease outbreaks in Freetown.

Between October and November:
- 128 patients were admitted into the paediatric in-patient ward.
- The major causes of morbidity seen were severe malaria (46%) and acute lower respiratory tract infections (39%)
- All the patients received appropriate first-line treatment within twelve hours of admission.
- The case fatality rate for paediatric in-patients was 3.25 - mostly attributable to severe complicated malaria and severe anaemia.
- In-house training programme continues with topics including paediatric observations, paediatric drug calculations, growth monitoring, diagnosis of malnutrition and management of childhood illness.

Adult In-patient:
Macauley Street Satellite Clinic continues to operate a 10-bed capacity adult in-patient/ maternity service.

Between October and November 2000
- 242 admissions and no deaths.
- The main morbidities were severe malaria (90.6%) and trauma related injury (23.8%). With an average of 1.4 morbidities diagnosed/admission.
- Patients requiring treatment for more than two days were referred to Connaught hospital for further treatment.
- Uncomplicated obstetric patients were observed as required in the unit. All complicated pregnancies were transferred to the Maternity Hospital where surgical services are available.
- Basic laboratory services were maintained. More complicated tests were referred to the Connaught hospital in Freetown. Merlin assisted displaced and other vulnerable people to obtain more comprehensive services where necessary.

Outpatients:
McCauley Street Satellite Clinic outpatient facility continued to provide care to both adults and children. A comprehensive range of curative care was offered and over 9478 patients (i.e. 40%, of which were under five years of age) were seen at the clinic between October and November 2000.

- The major cause of morbidity was malaria/fever of unknown origin (41.2%), acute respiratory infections/pneumonia (21%), intestinal worms (5.7%) for under fives and STDs (6.2%).
- An average of 1.7 morbidities/person seen.
- 833 women attended antenatal clinic and received TT2s
- Targeted health education key messages designed based on data evidence of most common details.
- Growth monitoring on all malnourished children being referred to the ACF feeding centres.
- Skilled paediatric/maternity supervision and monitoring of activities was undertaken regularly.

Expanded programme of immunisation (EPI):
EPI continues together with targeted health education in the community and the use of outreach targeted messages from the clinic. With such a fluctuating population, due to the recent IDP influxes, and wide potential coverage area it is unrealistic to establish coverage rates.

Cost Recovery and sustainability:
Sustainability and community participation health clinic management remains a priority. Without adequate financial controls and effective community involvement, health services could again become inaccessible to large amounts of the catchment population upon a Merlin and other agency withdrawal. Therefore, Merlin is working with the DHT, the clinic management teams, the community and the Village Health Committee, (VHD) towards launching cost recovery. Fees-for service (FFS) has operated in the OPD since October 1999. The occurrence of epidemic prone diseases (measles, dysentery and cholera) and the clinics status as admission centre for them prohibited the introduction of fees for service until November 2000. This has begun to be well received and "owned" by the community.

Actual Accomplishments throughout the programme period:
- Merlin provided full equipment, drugs, technical and financial support to Macauley Street Satellite Clinic and its expanded capacity for paediatric in-patients.
- All in-patients received appropriate first-line treatment within 12 hours of admission.
- Every overnight patient stayed under bednets that had been re-impregnated with insecticide.
- Full training on paediatric in-care was provided using standardised case definitions and protocols.
- Full outpatient services in paediatric and MCH clinics with EPI, nutritional surveillance of under five's and health education maintained throughout the reporting period.
- Skilled paediatric/maternity supervision and monitoring of activities was undertaken regularly.
- Facilitated community participation in the financial management of the clinic.
- 908 children received skilled paediatric inpatient care according to MoH protocols.
- Merlin was the first agency to respond to a measles outbreak in Eastern Freetown by establishing a measles isolation ward in November 1999
- Regular meetings with DMO and Director General of Medical Services

Comparison of Actual and Proposed Accomplishments
- This sub-objective was achieved in that, as planned and objectived quality healthcare, was improved over the contract period. However, as access to health care is intersectorally multifactoral it is difficult to suggest that this alone contributed to an improvement in the health status of the beneficiary population due to the large and statistically significant increase in the beneficiary population and the relatively low health status of the returnee population.
- There remains concern over handing back the paediatric facility at McCauley Street to the MoH given the continued problems at the Children's Hospital. Problems there require long-term interventions, monitoring and support - unlikely given the continued absence of development-orientated agencies willing to support tertiary centres. However, Merlin is a member of a

consultative team, including the MoH, UNICEF, WHO and MSF-B, that is trying to resolve some of these issues.

- Progress in the launch of cost recovery has been slow and hampered by mixed directives from the Ministry of Finance and Ministry of Health. The issue of who has control of the funds is the main point of contention (Ministry of Finance/Ministry of Health or the community health committees) and until this is resolved and a clear policy is produced, local and international agencies and MoH staff will remain cautious.

Sub-Objective 2

- Access to quality preventative and curative health care for displaced and/or returning populations increased in eastern suburbs of Freetown, surrounding villages and Newton camp.

Illustrative Activities

Merlin has responded to the health needs of the population through the establishment of mobile and followed by static clinics. As security has improved, and when each clinic has achieved set targets and standards, it has been handed back to the management of the MoH. Only Newton Health Centre now remains supported by Merlin. Newton covers an extremely large catchment population with large numbers of destitute people and IDPs attending the health centre, many walking for up to 20 miles and pts recorded from Mile 91 and Masieka.

Newton

Merlin provided the clinic with essential drugs and medical supplies on a weekly basis following accurate returns of their drug consumption. The health centre provided consultation, diagnosis and treatment for all adults and children, as well as EPI, antenatal care, nutritional screening and family planning. A strategically placed RCW42 fridge for the health centre ensured effective cold chain for both Newton and quality vaccine carriage for surrounding health posts. Newton Health Centre staff worked closely with the TBAs, encouraging all elements of safe motherhood. Health education was provided at each clinic and topics included hygiene promotion, the need for full immunisation and early presentation for treatment. Ministry of Health/Merlin standardised diagnostic and treatment protocols were used and staff trained and supervised appropriately. Rational prescription practice, strict treatment protocol practice and assessment of 'good practice' offered through clinical audit has been undertaken by the Merlin medical supervisor on a regular basic.

The OPD continues to see large numbers of patients of which an increasing number are from Waterloo IDP camp which is less than three miles away. ADRA manages an emergency clinic there but is being stretched by the heavy caseload (estimated population 27,000). Mechanisms have been put in place to ensure that patients are not merely 'shopping' for free drugs.

Between October and November 2000

- 9043 patients were seen, of which 4344 (48%) were under 5 years.
- The main morbidities were malaria (52.0%), pneumonia/ARI (11.2%) and anaemia (7.8%), with an average of 1.3 morbidities/person
- Ministry of Health/Merlin standardised diagnostic and treatment protocols were used and staff trained appropriately.

The Observation In patient Unit re-opened in October following a weeklong community sensitisation campaign. Utilisation remains low however, most likely due to the lack of functioning clinics in the area and poor knowledge of referral systems. Merlin and the DHT will now commence posting staff to safe areas with no available health care.

It has not been possible to introduce fees-for service or start a programme of cost-recovery due to the high numbers of displaced and disputed people in and around Newton. This is in an area already dense with official IDP's. Merlin is working closely with the community and the Health Committee has been revitalised

In November 2000, Merlin with OFDA funded a training of training workshop for 20 MCH-aides on the new refresher training manual for TBA's. MCH aides from Macauley Street Satellite Clinic, Newton and Songo catchment areas attended.

Malaria:
Due to the insecurity following May 2000, the malaria control programme had been postponed. Unfortunately, when security improved, the MoH deemed it necessary for Merlin and Oxfam to gain re-approval of the proposed programme, resulting in significant delays. Following confirmation that the programme could proceed a number of activities were undertaken:

- Malaria Prevalence Survey, October 2000 (See Annex 9. The malaria prevalence rate was 41.5% in the general population, 74.5% in children under 5 years of age, 28% adults over 50 years.
- Entomology Survey, November 2000 (See Annex 10) showed *Anopheles* mosquitoes accounted for 71.2% (mainly *anopheles gambiae*) of the mosquitoes captured through human bait collections in Newton. The parous rate was 85.9%.
- Training of trainers on residual spraying for the Ministry of Health, Department of Entomology employees.

Actual Accomplishments throughout the programme period:

- Following mobile health care delivery after Jan '99 invasion Merlin provided innovative health care to newly accessible areas, moving to less accessible areas when other health agencies were able to establish themselves in static sites. Populations that have benefited during this programme period have been Calabar Town, Allen Town, Kossoh Town, Jui Hangar IDP camp and Songo.
- At Allen Town Health Centre cost recovery was successfully launched in February 2000. The clinic is still functioning on a cost recovery basis, supported by the Ministry of Health. Songo Health Centre has also been handed back to the Ministry of Health and services have been maintained as documented by the DMO, with whom Merlin collaborates.
- Adequate essential drugs and materials were available in all clinics throughout the programme period confirmed by supervisory visits and monthly pharmacy stock checks.
- Over 95% of all consultations were provided according to standard MoH protocols as determined by direct supervision of health workers and confirmed by comparative analysis of monthly prescription audits.
- Merlin provided full material, technical, and financial support to static and mobile clinics
- The establishment of inpatient facility at Newton HealthCentre. The only clinic for in-patient ccare within 35 miles , the clinic (10 beds) is stringently supervised so that no patient remains more than 3 days.

Comparison of actual and proposed accomplishments.
As with Sub-objective 1 this objective was achieved. This, however, needs to be qualified by saying that, despite increased population, insecurity and suspension times targets were still achieved and increased population of IDPs .

- It has not been possible to introduce fees-for service or start a programme of cost-recovery due to the increase. Merlin works closely with the community and the Village Health Committee (VDC) has been revitalised.
- There have been significant delays in the implementation of the Newton malaria prevention and control programme as a result of the MoH requiring re-approval of the programme.

Sub Objective 3

- Health information systems (HIS) in all health facilities supported by Merlin from Freetown and Kenema are improved throughout the programme period.

Illustrative activities
Merlin, through its wide network of clinics, outreach staff, and health facilities, has established a comprehensive disease surveillance system. Health staff at all levels are able to identify and respond

appropriately to a disease outbreak. All Merlin-supported facilities maintained basic epidemiological monitoring systems and submitted disease surveillance records and drug usage records on a weekly basis in Freetown and a monthly basis in Kenema District. The information was submitted to the Ministry of Health and integrated into the national disease surveillance system. In addition, the staff were trained to analyse and interpret records and appropriate action to be taken to ensure an early warning system of disease outbreaks. Case reports of suspected disease were promptly investigated, appropriate action taken and information disseminated to the appropriate and relevant authorities and other NGO's. Merlin co-ordinated all its disease surveillance activities and outbreak with cholera, bloody diarrhoea and measles outbreaks that occurred during the programme period. This was demonstrated by the effective responses.

Each health facility is supplied with drugs and other medical supplies on monthly basis. Drugs consumption is monitored on every supervision visit against the morbidity record and any discrepancies verified with the in-charge. Also the monthly drugs supplies are based on the presentation of the morbidity report. Samples of prescriptions are collected and analysed against diagnosis and number of drugs prescribed for same. During this reporting period Merlin introduced a quarterly audit of prescription/clinic records to review prescription practice.

Actual Accomplishments throughout the programme period:

- With weekly collection and monitoring of morbidity data Merlin has assisted MOH to respond to disease outbreaks. As such this sub-objective was achieved.

Sub Objective 4

- Merlin's capacity maintained to appropriately respond to diarrhoeal and vaccine preventable disease outbreaks in Freetown.

Staff continued to receive refresher training in standard emergency protocols for the prevention, diagnosis and treatment of diarrhoeal and vaccine preventable disease. Recent disease-specific training was undertaken on the diagnosis, treatment, and management of bloody diarrhoea, measles and cholera, emphasising appropriate and rational use of antibiotics.

Merlin still has capacity for the potential extension at MacSt Clinic to be converted speedily to an outbreak disease centre. However, diarrhoeal disease outbreaks that were so characteristic of last year have not occurred and the structure continued to serve as a paediatric ward throughout the reporting period.

Merlin, a key member of the Lassa Fever and cholera Task Force, co-ordinated all its activities in disease surveillance and outbreak control with the Ministry of Health. In conjunction with the effective HIS. Merlin has retained human resources and equipment to provide a rapid response to the range of possible emergencies in the Eastern Province. Supplies are pre-positioned to be able to respond to severe, including trauma cases, as well as those suffering from severe malnutrition, infectious or other common diseases.

Actual Accomplishments throughout the programme period:

- During the reporting period Merlin responded to disease outbreaks through the establish of treatment isolation facilities, health education and emergency vaccination campaigns:

Cholera	June 1999
Shigella.BD	October 1999 and March 2000
Measles	November 1999 in Eastern Freetown, March 2000 in Songo and Newton
Lassa Fever	January and June 2000

- Merlin has been a key player in the Task Forces and led as an agency working with WHO in combating potential Lassa Fever outbreaks in Freetown
- Merlin co-ordinated a mass measles campaign in April 2000 from Songo through to Freetown/and Hastings vaccinating 9,861 children 6 months to five years.
- Merlin has supported the Ministry of Health in undertaking NID its emergency measles vaccination campaign in November 1999 and the multi antigen EPI campaign in Oct /Nov 2000.

- Emergency stocks (including full cholera kit) have been maintained in Freetown at all times.

Actual
Sub Objective 5

- Access to quality basic preventative and curative health care for war affected and displaced populations in Kenema Town and District maintained

Illustrative activities

Peripheral Health Units
(For locations of PHUs see annexes 1 and 2)

Throughout the reporting period, security situation in Merlin operational areas has remained relatively calm with the exception of Talia PHU and the surrounding villages. Rebels at the nearby Bendu junction were reported to be in search of youth's labourers. Otherwise all eleven PHUs remained accessible in terms of security. However, heavy rains, broken bridges and bad roads rendered supervision impossible to some PHUs (Tungie, Mondema, Baama and Falla). Never the less, the programme has continued to achieve its objectives and supervisors come in from each PHU to attend meetings at Merlin/MOH at the end of every month in Kenema town.

Merlin has supported eleven MOH PHUs with the exception of Talia PHU. Existing clinics at: Blama, Foindu, Baama, Doujou, Nekabo, Kundorma, Levuma, Falla, Largo, Mondema and Tungie were continually supported with essential drugs, equipment and incentives. Talia has remained closed due to insecurity. Merlin retained the capacity to support Lowuma and Wuima PHUs when the areas became accessible. Merlin also continued to support the KGH MCH Clinic. A decision was made by the Hospital Board that this MCH clinic can now admit paediatric patients directly into the paediatric ward thereby implicitly operating as a paediatric outpatients.

The MCH clinic, as the key primary health care unit in Kenema Town, continued to see large numbers of patients throughout October and November 2000

- 10,174 total attendance with total of morbidities of 28,374 (average 2.8 morbidities/consultation).
- The major causes of morbidity were malaria/FUO (8671 cases, representing 85.2% of patients seen), acute respiratory tract infections (5401 cases, 53.1%) and STD (396 cases, 3.9%).
- A total of 1391 antenatal consultations were carried out. All high risk mothers were referred to Kenema Government hospital.
- A total of 829 BCG, 754 Polio1/DPT, 485 Polio3/DPT , 846 measles immunisations were undertaken with 336 fully immunised.

The functioning PHU clinics (n=11) reported:

- 18,127 total attendance during the reporting period. A total morbidity of 32,177 (average 1.7 morbidity/consultation) were diagnosed at all PHUs.
- Main morbidity was malaria with 8476 (A high 46.76% of patients seen) followed by pneumonia with 3867 (21.3%). STD represented 886 cases (4.8%) and watery diarrhoea 669 cases (3.7%).
- Maternity services were provided in all clinics and MOH staff worked alongside trainedTBA's in community antenatal and Safe Motherhood care.
- A total of 2,944 antenatal consultations were carried out with 461 deliveries, 269 (58.4%) by trained TBA's, 51 (11.1%) by untrained TBA's, 5 (1.1%) by MCH aides at MCH posts and 0% at home alone. 2 cases were referred to Kenema Government hospital.

- Monthly meeting were held between each PHU MCH-aide and TBA's in their catchment areas to encourage collaboration, support, reporting and appropriate referral.
- A total of 935 BCG, 818 Polio1/DPT, 791 Polio3/DPT , 1348 measles immunisations were undertaken with 577 fully immunised

EPI.

Merlin continued to collaborate with support MOH throughout the reporting period. Merlin provided two mobiles to transport staffs and NID supplies to Gorama Mende and Wandor chiefdoms. All PHU staffs participated fully in sensitisation, mobilisation during the NID exercise for five days.

EPI activities were undertaken in all clinics: Merlin assisted MoH in the cold chain maintenance, lobbying for resupplies from MOH Freetown when necessary. The country experienced an acute shortage of vaccines and gas bottles resulting in defaulters and mothers and children waiting. Merlin, in collaboration with other International NGO's has written a joint letter to the DMO requesting for his urgent attention to the matter. Two MOH full EPI campaigns had limited effect due to low supervision and insecurity. MOH will be better supported in the future so as to achieve improved national capacity.

Nutritional surveillance

PHU staff and outreach workers complement each other by performing routine and emergency nutritional surveillance. All nutritional surveillance is focused on groups within the community that are most vulnerable to a reduction in nutritional input, namely children under 5 years, pregnant and lactating women. PHU staff conduct weight and height measurements as part of growth monitoring and the provision of preventative nutritional interventions, such as education on weaning practices. Outreach workers conduct routine screening, using MUAC tapes, throughout Kenema town, district and displaced camps. In response to problems identified the outreach teams can be mobilised to undertake rapid screening exercises and in some cases retraining of health staff appointed at the clinic.

TFC/SFP admissions have gradually decreased as a result of improved food production, intensive health education and active case finding. Goal continued SFP programme in Doujou, Blama, Levuma and Nekabo clinics where identified moderate malnourished cases are referred. Falla, Baama, Mondema, and Tungie referred to ACF TFC and SFP feeding programmes in their proximity. A Merlin nutrition consultant/trainer has been in country since November 2000. She addressed some food security issues and national nutrition training needs.

Supervision

A supervision programme was undertaken by the Merlin expatriate and local supervisors jointly with the District Health Midwife. To assist in improving access to these areas the communities, through the Village Development Committees (VDCs), embarked on road maintenance and repairing the damaged bridges. On-site training and support continued throughout the reporting period. All the staff used standardised ministry of health /Merlin/MSF case definitions and protocols. This was assessed monthly through an audit of the clinic cards and on-site supervisory visits. Fourteen MCH aides and fourteen In-Charges attended a one day and two day training workshop respectively on review of case definition, diagnosis and management of obstetrics emergencies and prompt referral. Other topics for the in-charges covered management of uncomplicated malaria, ARI, measles and disease surveillance. Short training sessions were also carried out monthly before the In-Charges left to their various PHUs.

Health information systems and staff performance appraisal

In order to obtain more accurate baseline population data, estimate population and comparison the epidemiological data, all Merlin supported PHUs undertook population census in all their catchment areas. This assists in measuring future accurate impact of the programme. Measuring the impact of the programme will be possible using the population baseline data. The exercise was carried out in collaboration with the Ministry of Health. Community participation was encouraged and section chiefs kept the records of their catchment villages. Details collected included date, chiefdom, village, age, sex, address, etc. A copy of all the census data was retained at every PHU for future reference. Copies will be distributed to the MOH; all international and local NGOs working in Kenema District and mechanisms are in place to monitor population movements and data.

Progress has been made in that the PHU In-Charges attended monthly meetings chaired by the DMO. A review of all PHU registers and HIS forms was undertaken in collaboration with DMO and a new format for epidemiological introduced. Drug consumption was compared with epidemiological data per age group before re-supply.

A staff performance and appraisal tool was also used on different staff categories to identify areas requiring improvement and identify staff training needs. All PHU staff were appraised, with in-charges trained in staff appraisal techniques. Regular staff meetings were held to create a forum for sharing, team development and improve communication within the staff members.

Sustainability and cost recovery
Part of Merlin exit strategy is to ensure sustainability through responsible community participation in the management and maintenance of the PHUs. Through the Merlin Community Development Officer and PHU supervisors, communities have been supported in restructuring poor and inactive VDC with emphasis on gender representation. Community participation for sustainability was emphasised and communities are gaining confidence and have pride in their achievements in the health sector: The communities of Baama, Mondema and Doujou collected sand, stones, and sticks and provided food for work and supervision of the construction. Mondema PHU building is due to be completed in December. Roofing is in progress for Baama and Doujou clinics. Foindu PHU proposal was approved but is awaiting improvement of security situation in the area. Nekabo, Talia and Kundorma clinics have compiled the health centre proposals and have been approved by the donor agencies.

Through the Community Development Officer and supervisors, Merlin monitored the progress of each PHU and its community following the cost recovery workshop in July 2000. Additional VDC training needs have been identified in an effort to empower communities in the co-management of the PHUs. Monthly VDC meetings were held in all Merlin supported PHU's with a copy of minutes to the PHU. Through the VDC, communities have planned to start various income generating activities to ensure provision of more support and development through the PHU when Merlin exits.

Constraints relating to cost recovery launch persist and challenges to collaborate with and lobby DHMT exist. Agency support to PHUs have been discussed at Freetown level but there is still no clear policy or definitive directive. This will continue to be addressed by MOH and all agencies with urgency.

Emergency Clinics
Two significant displaced populations were provided with health care using temporary emergency clinics. The two used experienced displaced staff to provide health services Community participation was encouraged where possible. Lebanese clinic TBA's provided sticks, prepared land and provided unskilled labour for reconstruction of a new TBA booth. Merlin supported the community by providing plastic sheeting, zinc and skilled labour. More population influx of IDPs has been registered in the two camps. Majority are from refugee camps in Liberia and Guinea. The increase in displaced persons in the camp has increased the health services demand particularly on Blama IPD clinic.

Between October and November 2000 the emergency clinics (see above) reported (n=2):

- 10,548 total attendance during the reporting period. A total morbidity of 28,375 (average 2.7 morbidity/consultation) were diagnosed at all PHUs.
- Main morbidity was malaria with 3,932 (37.28% of patients seen) followed by pneumonia with 2,015 (19.1%). Maternity services were provided in all clinics and Ministry of Health staff worked alongside trained Traditional Birth Attendants (TBA's) in the community on all issues pertaining to antenatal care and Safe Motherhood.
- There were 1106 antenatal consultations with 171 safe deliveries, 97 (56.7%) by trained TBA's, 0 by untrained TBA's, 28 (16.4%) by MCH aides at MCH posts and 25 (14.6%) at home alone.
- Monthly meetings were held between each PHU MCH-aide and TBA's in the relevant catchment areas to encourage collaboration, support, reporting and appropriate referral.

- A total of 307 BCG, 261 Polio1/DPT, 447 Polio3/DPT , 1594 measles immunisations were undertaken with 1517 fully immunised
- Malaria control prevention, bed nets monitoring and Health education services continued in the three main camps in Kenema and Blama townships by Community health volunteers (CHVs).

As a result of the overcrowded conditions and increased risk of diarrhoeal and vaccine preventable diseases, health education and immunisation was intensified in the camps, with newly arrived IDP's specifically targeted.

Malaria Prevention and Control Programme:
Malaria control prevention, bed nets monitoring and Health education services continued in the three main camps in Kenema and Blama townships by Community health volunteers (CHVs). The use of the insecticide treated nets (ITNs) distributed in the previous programme period to vulnerable groups within the IDP camps was monitored to evaluate bed net retention and usage.

A census of the catchment areas of Blama (46 villages) and Levuma (26 villages) Primary Health Units (PHU) were undertaken to ensure baseline population data on which to base: Selection of vulnerable groups. Calculation of spraying materials required and evaluation of morbidity data to enable measurement of impact of the malaria prevention and control activities. Residual spraying was undertaken in the catchment areas of Blama and Levuma PHUs. (see page 17 for rationale)

Alongside these preventative and control strategies Merlin supports 14 Primary health care facilities and the paediatric ward within the district hospital. Merlin strives to provide high standards of clinical care through collaboration with the MoH, who are supported with a supply of drugs and technical training according to the MOH National Guidelines for the treatment of malaria.

Actual Accomplishments throughout the programme period:

PHUs and Emergency clinics:

- Merlin has supported up to 24 PHUs during this reporting period. In June 2000 it was decided to rationalise and consolidate into up to 14 strategically placed PHUs.
- Merlin has been able to provide affordable, accessible and appropriate preventive and curative primary health care services throughout the programme period despite the evacuation of expatriate staff and restricted movement.
- Merlin provided full material, technical, and financial support to static and mobile clinics
- For the year 2000 consultation rates have been calculated at 1.7 consultations/child under 5 years/year and 0.7/person/year[1] according to chiefdom population figures in areas where there are Merlin supported PHUs. There was a total of 148,773 under five consultations, 102,010 over five, 46,339 ANC consultations. See Annex 3
- Mthly training on key health topics throughout the programme period.
- Mthly supervision at each clinic when security and road conditions allowed
- Monitoring disease trends (a review of selected morbidity trends in annex 4) and drug consumption; promoting rational drug use. The average number of types of drugs used per consultation was 2.6
- The upwards trend towards cost recovery has begun by re-vitalisation VDCs, opening community bank accounts, introducing fees for service whilst ensuring access to free health care for destitutes.
- All CHOs in Merlin supported clinics have attended a cost recovery workshop in July 2000 co-hosted by UNICEF and WHO.
- Merlin has developed strong links with IRC and ICRC and DMO/DHT.

[1] This is an unadjusted figure. Figures for clinics that have been supported for less than the full 12 months have not been adjusted to accounted for the estimated attendance not reported

Malaria Prevention and Control Programme

- Prevalence Survey, December 1999, showed a *P. falciparum* prevalence rate of 51% in the three IDP camps surveyed. The malaria prevalence rate was highest in children under 5 years of age (71%) and least in adults over 50 years (25%).
- The KAP survey, December 1999, revealed 56% of respondents were aware of the association between mosquitoes and malaria.The majority of respondents experiencing fever self-prescribed treatment (71%), only 28% presented to a health facility for treatment. An equal number of respondents would equally rather seek treatment from traditional healers (46%)
- A health education programme aimed to increase community awareness of malaria - malaria recognition, transmission control, promoting appropriate treatment seeking behaviour- by working through women's' groups (150 women from 30 women's groups) and community health volunteers (91 CHVs).
- Training on the new MOHS National Malaria Treatment Guidelines to 18 Community Health Officers.
- Residual spraying (using Lambda-cylothorin, ICON) was undertaken, through MoH selected counterparts, within IDP camps as an emergency control measure for the endophilic anopheles mosquitoes. 3090 shelters in the 3 IDP camps and 18,309 rooms in the PHU catchment areas of Blama and Levuma (total population 56,913) were sprayed.
- Distribution of ITNs, on a cost recovery basis, to vulnerable groups identified during the census- under fives and pregnant women. To ensure that they had access to these nets at all times a net was given to the head of household also. 6263 nets were distributed in the three IDP camps. Three months after distribution a retention of 95% was demonstrated, by random sampling of 40% of the target population.

2. Comparison of Actual and Proposed Accomplishments

PHUs:

All aspects of sub-objective 5 were achieved in that Merlin and an increasingly active and marginally more confident MOH provided much-needed preventative and curative services for displaced populations whilst maintaining the continual capacity to respond to mass population movements. In a climate of uncertainty over the past year with population numbers changing frequently Merlin has maintained resources and managerial integrity to address challenging issues such as cost recovery in PHUs.

- Lack of DHT planning remains a major obstacle to cost recovery. National health sector bodies need assistance in most aspects in the management and delivery of the health care services. This is complicated by the MOH policy to decentralise drug management and re supplies, vaccines, and equipment to the district with limited co-ordination and limited training provided to the districts. Also the continued insecurity in the district, reduced access, population movements and high levels of displaced and destitute populations result in the fact that it is not yet appropriate to launch full cost recovery. However, Merlin worked with MOH at both central and district level to establish a strong and systematised infrastructure within the PHU's and district for cost recovery. Each PHU/VDC has a bank account and their fee for service income has been transferred to these accounts. Percentages collected are closely monitored with a minimum 80% fees collected from the total patients seen being the target (See Annex 5).

Malaria Control and Prevention Programme:

Due to disruption of activities and evacuation of expatriate staff during the May 2000 hostilities and continuing insecurity in the district, the programme was postponed for a period approximately two months. Whilst the camps remained accessible all district based activities, including transportation and moving of stocks, were kept to a minimum. Consequently the programme is behind schedule and all the planned activities have not been completed during this programme period.

Sub-Objective 7

- Merlin's capacity to appropriately respond to disease outbreaks and / or additional trauma cases in Kenema district and Western part of Kailahun increased

General Outreach Team
The general and Lassa Fever outreach teams remained proactive in active case finding, diseases surveillance, and contact tracing activities in Kenema Township, the IDPs camps, and in the most secured areas in the district. Staff received refresher training in standard emergency protocols for the prevention, diagnosis and treatment of communicable diseases and malnutrition. Recent disease-specific training was undertaken on the diagnosis, treatment, and management of bloody diarrhoea, measles and cholera, emphasising appropriate and rational use of antibiotics. In addition, emphasis has been placed on the training of Blue Flag Volunteers (nation-wide community volunteers) in the principles of disease outbreak prevention and control and health education

All Merlin health and Outreach workers were trained according to the WHO case definition for Yellow Fever, as the threat of spread from Liberia arose due to the population movements due to ever increasing insecurity in Lofa county. The Lassa Fever Unit (also supported by Merlin/ECHO) was designated the referral centre for any suspected cases. In parallel to these activities MSF undertook an immunisation campaign along the border chiefdoms. There were no reported suspected cases of Yellow fever occurring in Kenema District.

Between October and November 2000 there were no other significant diarrhoeal or vaccine preventable disease outbreaks. Ongoing outreach activities within the town and IDP camps include; immunisation and feeding centre defaulter tracing, commodity tracking, nutritional screening, graveyard monitoring, active case finding and appropriate referral, assessment and lobbying for improvement of sanitation and safe water supplies and community education regarding environmental hygiene and disease prevention.

Lassa Fever Outreach Team
The Lassa outreach team continued to carry out targeted evidence-based health education, active case finding, and contact tracing of patients' relatives. The situation in each of the camps and Kenema town was closely monitored throughout the programme to ensure an effective disease surveillance system. For the period from September to November, the numbers of cases were few and are on the increase from December as we enter Lassa season, the dry season. A number of cases were reported in Pujehun with the source identified as Segbwema. Merlin in collaboration with MSF-b and MoH conducted a five-day training workshop for five staffs (identified by MSF-b) on prevention, isolation and barrier nursing. The Lassa outreach visited the area for health education and active case finding. Health education through the radio f/m stations was maintained to cover large populations. Lassa information billboards were placed at strategic points throughout Kenema town to increase awareness and provide key information.

Due to security concerns, much of the Lassa fever belt remains inaccessible and so radio discussion programmes are broadcast throughout the District. Topics covered include modes of transmission of Lassa and prevention, the symptoms of Lassa and importance of prompt initiation of treatment. During this reporting period a new health education video was developed using a local drama group and local school children. This is now used in all the health education sessions.

The Lassa belt appears to be widening and so education is being disseminated to areas where cases have not previously presented. There are also an unusually high number of cases being seen outside the traditional Lassa season (November - May) - thought to be due to overcrowded conditions.

Actual Accomplishments throughout the programme period:

- Essential medical and logistical stocks in Kenema and Blama were pre-positioned, rotated and confirmed on a monthly basis by emergency preparedness stock takes.
- All health staff completed training in emergency response protocols for diarrhoeal, vaccine preventable outbreaks and Lassa fever as part of Merlin's ongoing training programme.
- Merlin effectively co-ordinated its disease surveillance and outbreak control with the MoH and other agencies in the district during the cholera, bloody diarrhoea and measles outbreaks in 1999 and 2000.

- Merlin has been the lead agency in the curative and preventative strategies against Lassa Fever. 2000 saw an increase in both the number of suspected cases seen and the different geographical areas affected- Kenema, Pujehun, Bo and Freetown. Merlin was able to utilise it team of skilled expatriate and local staff in an efficient and effective manner. Merlin undertook a series of training workshops in Pujehun, Bo and Freetown to varying cadres and professionals throughout 2000 and has done much to disseminate information on the recognition and appropriate referral procedure for suspected Lassa cases. Merlin has worked closely with WHO and developed strong links with CDC Atlanta, Epicentre and the Public Health Laboratories, London. (Lassa trends and source can be seen in Annex 6).

Objective 2
Reduce incidence of morbidity and mortality associated with malnutrition among the vulnerable displaced, resident and returned population of Kenema town and District through the provision of emergency nutritional support.

Sub-Objective 1
- Prevalence of moderate and severe malnutrition among children under 5 reduced to/maintained below 10% and 1% respectively.

1. Actual Accomplishments
This sub-objective has been achieved in line with details as outlined below. Merlin has maintained its commitment to targeted feeding programmes within Kenema town and serving the population of the surrounding districts. This has consisted of a TFC with a capacity for 450 children under 5 years and a SFP with a capacity for 2000 children under 5 years and pregnant and lactating women. Admissions are made according to WHO/CDC anthropometric standards. Merlin is working with the National taskforce to set guidelines on admission, feeding protocols and discharge criteria based on current research. To be implemented in feeding centres throughout Sierra Leone, after a pilot is completed.

During this reporting period numbers of admissions at the therapeutic and supplementary feeding programmes remained (see Table 3.)

Between October and November, the TFC continued to provide a high standard of care for beneficiaries. This is demonstrated by indicators that are well within agreed SPHERE minimum standards:

Table 3: TFC figures October and November 2000

	Merlin/OFDA TFC	Sphere minimum standards
Total admissions	221	
Cure rate	81.5%	>75%
Mortality rate	6.3%	<10%
Defaulter rate	8.4%	<15%
Average weight gain	11g/kg/day	8g/kg/day

Although not functioning up to full patient capacity as numbers are reduced, it is acknowledged that this centre continues to provide a necessary function for those most vulnerable in the population that Merlin is serving.

The trend seen within TFC is also reflected in lower than expected numbers in SFP and the continued decline in admission numbers. The distribution of a premix dry ration, supplied by the World Food Programme, enables nutritional support to children with moderate rates of malnutrition. In addition the SFP has helped to rehabilitate discharged patients from MSF's Shigella treatment facility at Dauda camp.

Table 4: SFP figures October and November 2000:

	Merlin/OFDA SFP	Sphere minimum standards
Total admissions	669	
Cure rate	89.1%	>70%
Mortality rate	0%	<3%
Defaulter rate	1.79%	<15%

The low number of Kenema SFP beneficiaries is also a consequence of increased collaboration between Merlin and GOAL-supported SFPs. Discharges from TFC are transferred into the nearest SFP in the district rather than to the central Kenema SFP. Merlin supported PHU's staff has also been informed of the location of SFPs in the district and so refers cases directly.

The defaulter rate remains commendably low, particularly in such a mobile population. This is largely due to the Outreach Teams, in tracing mothers who have defaulted and educating them about the importance of returning to complete the feeding programme.

Throughout the Merlin feeding programme there is a disproportionately high admission rate for Kwashiorkor against Marasmus. This is thought to be due to poor weaning practices and the use of "rice pap" as a weaning food. During their stay in the feeding programme mothers are educated about the importance of high protein porridge and lipid intake to maintain calorie intake for children. Key health education messages are developed and disseminated.

Children who fail to thrive whilst in the feeding programme undergo scrutiny by an expatriate medic and if no feeding problem is highlighted the child undergoes testing for Tuberculosis. If the results are positive then they are referred to the National TB programme based at Kenema Government Hospital, they stay within Merlin paediatric ward for the first two months of daily observed treatment and then are followed up in the community by the National programme.

Actual Accomplishments throughout the programme period:

- At the beginning of the programme period Merlin was operating a decentralised SFP and two TFC sites (Blama and Kenema Town). Following the results of the July 1999 nutritional survey of Blama and Kenema Town and IDP camps showing Global Acute Malnutrition (GAM)Rates of 10.2% and Severe Acute Malnutrition (SAM) at 2.6% Merlin handed over the management of most of its SFPs to Goal so it could concentrate on the management of the TFC. Following lobbying of the food pipeline agencies to deliver regular monthly food distributions, intensified nutritional surveillance and health education programmes, the GAM was 2.7% and SAM 1% in the December 1999 nutritional survey. Levels of malnutrition in these areas appear to stabilise around these figures since.
- Between July 1999 and November 2000, 10,020 SFP beneficiaries attended. The overall cure rate as a proportion of exits was 79.2%, the defaulter rate 6.4% and death rate 1.7%.
- Between July 1999 and November 2000, there were 4,154 TFC beneficiaries. The overall cure rate as a proportion of exits was 87.1%, the defaulter rate was 6.64%, and the death rate was 3.41%.
- As TFC admissions declined as a result of the improved nutritional status in the Towns and IDP camps Merlin adjusted its inputs and consequently closed Blama TFC. However Merlin has continually maintained the capacity to establish a 400 bed capacity TFC and 1000 beneficiary capacity SFP
- TFC and SFP trends throughout the programme period can be seen in Annexes 7 and 8.

2. Comparison of Actual and Proposed Accomplishments

Sub-Objective 2

- Nutritional surveillance of the under 5 population in Kenema town and District maintained

Objectives have been achieved, in as much as the nutritional status of children under fives has consistently improved throughout the reporting period.

PHU staff and outreach workers complement each other by performing routine and emergency nutritional surveillance. All nutritional surveillance is focused on groups within the community that are most vulnerable to a reduction in nutritional input. PHU staff conduct weight and height measurements as part of growth monitoring and the provision of preventative nutritional interventions, such as education on weaning practices. Outreach workers conduct routine screening, using MUAC tapes, throughout Kenema town, district and displaced camps. In response to problems identified at PHU level the outreach teams can be mobilised to undertake rapid screening exercises and in some cases retraining of health staff appointed at the clinic.

The July 2000 nutritional survey was attached to the previous Merlin/OFDA interim report. The most recent survey was undertaken January 2001 and whilst not covering this reporting period is included in the annexes. The results from Kenema town and camps were are encouraging, showing a continuing stabilisation of the malnutrition rates since December 2000. Illustrating the success of the various interventions used by the Merlin, Goal, ACF and the food pipeline agencies during this period. However large areas of Kenema District are not accessible and this survey cannot be extrapolated to cover this population as they are subject to different circumstances. Continued monitoring needs to be carried out to prevent another deterioration of the situation. Merlin continues to play an advocacy role to promote access to adequate food supplies for all displaced people.

B. POSITIVE EFFECTS OF PROGRAM ON TARGET POPULATIONS

Merlin has continued throughout the programme period to target support to the most vulnerable, specifically the displaced population, under 5s', pregnant and lactating women for targeted nutritional support and malaria control to reduce avoidable mortality and morbidity amongst this highly vulnerable section of the population. The current emergency clinics and malaria control interventions directly benefited the largest displaced population in Kenema and Blama, as well as the displaced populations from Kono district camped in Baama and Konta. Newly opened clinics served the communities in more remote areas of Kenema district and provided accessible care for neighbouring communities from Kailahun and Kono districts as access for the Merlin teams into these areas increased and the beneficiaries' freedom of movement also increased.

Merlin temporary paediatric care facilities in Freetown served an estimated under five year-old population of 164,000 within the estimated Freetown population of 1 million. The main beneficiaries of the community mobile clinic continued to be the displaced and resident population in east and central Freetown, especially the more remote resident and IDP populations around Songo and Newton. The total displaced and resident population of the target areas benefited from epidemiological surveillance and the emergency preparedness stock for diarrhoeal outbreak response has been pre-positioned at Merlin supported facilities most strategically placed to respond. A further estimated 3,000 camped at Newton benefited from a static outpatient clinic and the establishment of emergency inpatient facilities.

There have been dramatic and encouraging improvements in the nutrition and health status of the population, particularly of children and lactating and pregnant women.

C. EFFECT ON OVERALL PROGRAM PERFORMACE OF UNFORESEEN CIRCUMSTANCES

The insecurity and poor road conditions limited supervision in the district and access to services by the beneficiaries. As both security and road conditions improved at the end of the rainy season, Merlin has been quick to re-establish services and its ongoing programme of supervision.

Delays by the Department of Malaria Control in granting new permission to undertake malaria control activities in Newton

IV. RESOURCE USE / EXPENDITURES

A. BREAKDOWN OF EXPENDITURE BY OBJECTIVES

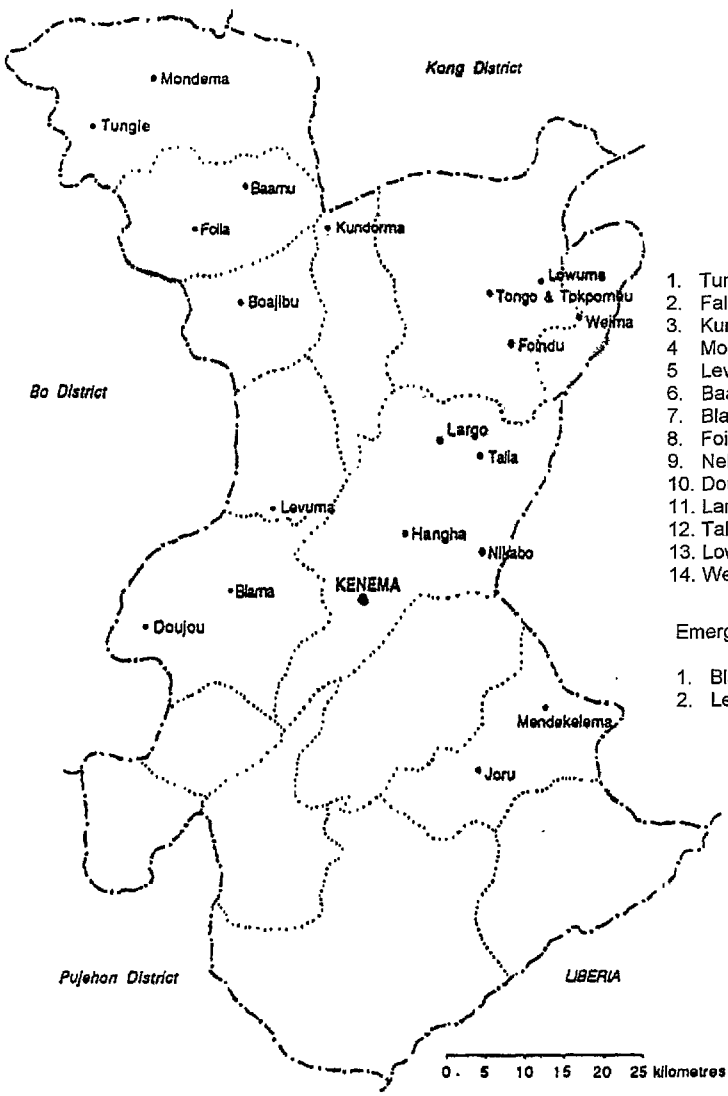
Please see previously submitted sheets

ANNEX 1:

EASTERN REGION
Map Showing
CHIEFDOMS
N
Kondewakor
Toli
Guinea
River Mali
Kayima
Sando
Lei
Saiama
INSET
Sierra Leone
Northern Province
Southern Province
Eastern Province
Liberia
50 mls
80km.
Kamara
Tumbodu
Gbense
SEFADU
Faiama
Mafindo
Kamiendo
Kainkordu
Koardu
Soa
New Sembehun
Njagbwema
Nimi Koro
Nimi Yemd
Jaiama (Nimikoro)
Tankoro
Gbane Kando
Jaiama (Sewafe)
Gbane
Guinea
Gandorhun
Gorama Mende
Tungie
Gorama Kono
Kangama
Sandaru
Kissi Kama
Kissi Teng
Dia
Kangama
Yawei
Penguia
R. Mafi
R. Moa
Wando
Bandajuma
Falloh
Lower Bambara
KAILAHUN
Luawa
Bwedu
Kissi Tongi
Boajibu
Dodo
Simbaru
Dodo
Panguma
Sembehun
Malegohun
Bunumbu
West Peje
Manowa
R. Magowi
Peje Bongre
Upper Bambara
Pemdembu
Kandu Leppiama
Gbado
Jaluahun
R. Meowa
Nongowa
Segbwema
Daru
Mobai
Mandu
Baiwala
Dia
Small Bo
Blama
KENEMA
Jawi
Dama
Giema
Niawa
Senduma
Gaura
Jaru
Jojoima
Malema
Yabaima
Langrama
Bnoma
Koya
Nomo
Taama
Tunkia
Gorahun
R. Mano
Liberia
District Headquarters
Chiefdom Headquarters
Chiefdom Boundary
District Boundary
E S
5 10 15 20 25 30

ANNEX 2:

Merlin Supported PHU's



1. Tungie
2. Falia
3. Kundorma
4 Mondema
5 Levuma
6. Baamu
7. Blama
8. Foindu
9. Nekabo
10. Doujou
11. Largo
12. Talia (Pending Security)
13. Lowuma (Pending Security)
14. Weima (Pending Security)

Emergency Clinics

1. Blama IDP
2. Lebanese IDP

ANNEX 3: CONSULTATION RATES IN MERLIN-SUPORTED PHU AREAS

TABLE 1: ***Consultation rates/person/year in Chiefdoms with Merlin supported PHUs***

Chiefdom	Wandor		Small Bo			Nongowa					
Total Pop	18147		32206			281705					
Total <5	3085		5475			47889					
Clinic	Baama	Falla	Blama	Doujou	Blama IDP	MCH	Nekabo	Largo	Lebanese IDP	Hangha	Talia
Number of months supported	12mths	6 mths	12mths	12mths	12mths	12mths	7 mths	12mths	12mths	6 mths	7 mths
<5 consultations	4040	3463	9633	7793	8499	32100	2243	6564	15254	6564	2854
>5	1805	2322	6393	3153	5768	8725	1510	5049	19845	5049	1982
ANC	2520	3073	1897	1083	2777	6896	585	1895	5196	1895	677
Total	**8365**	**8858**	**17923**	**12029**	**17044**	**47721**	**4301**	**13508**	**40295**	**13508**	**4740**
estimated full 12 months figures											
<5	4040	6926	9633	7793	8499	32100	3845	6564	15254	13128	4893
>5	1805	4644	6393	3153	5768	8725	2589	5049	19845	10098	3398
ANC	2520	6146	1897	1083	2777	6896	1003	1895	5196	3790	1161

TABLE 1 continued: ***Consultation rates/person/year in Chiefdoms with Merlin supported PHUs***

Chiefdom	Gorama Mende				Kaindu Lekpeyama		Lower Bambara	Nomo	
Total Pop	33694				19188		49994	3176	
Total <5	1348				768		2000	127	
Clinic	5728				3262		8499	540	
<5 consultations	Mondema	Tungie	Konta	Konta IDP	Boama Oil mill	Levuma	Foindu	Kamboma	Faima
Length	12mths	12mths	12mths	3 mths	6 mths	12mths	12mths	9 mths	6 mths
< 5	3503	4168	1146	1230	2432	7353	3029	2532	2616
>5	2537	2967	1331	2529	1876	5894	3350	2150	1667
ANC	1128	1097	396	1173	708	2900	1780	553	749
Total	**6701**	**8232**	**2873**	**4932**	**5016**	**16147**	**8159**	**5235**	**5032**
<5	3503	4168	1146	4920	4864	7353	3029	3376	5232
>5	2537	2967	1331	10116	3752	5894	3350	2867	3334
ANC	1128	1097	396	4692	1416	2900	1780	737	1498
TOTAL	**6701**	**8232**	**2873**	19728	10032	**16147**	**8159**	6980	10064

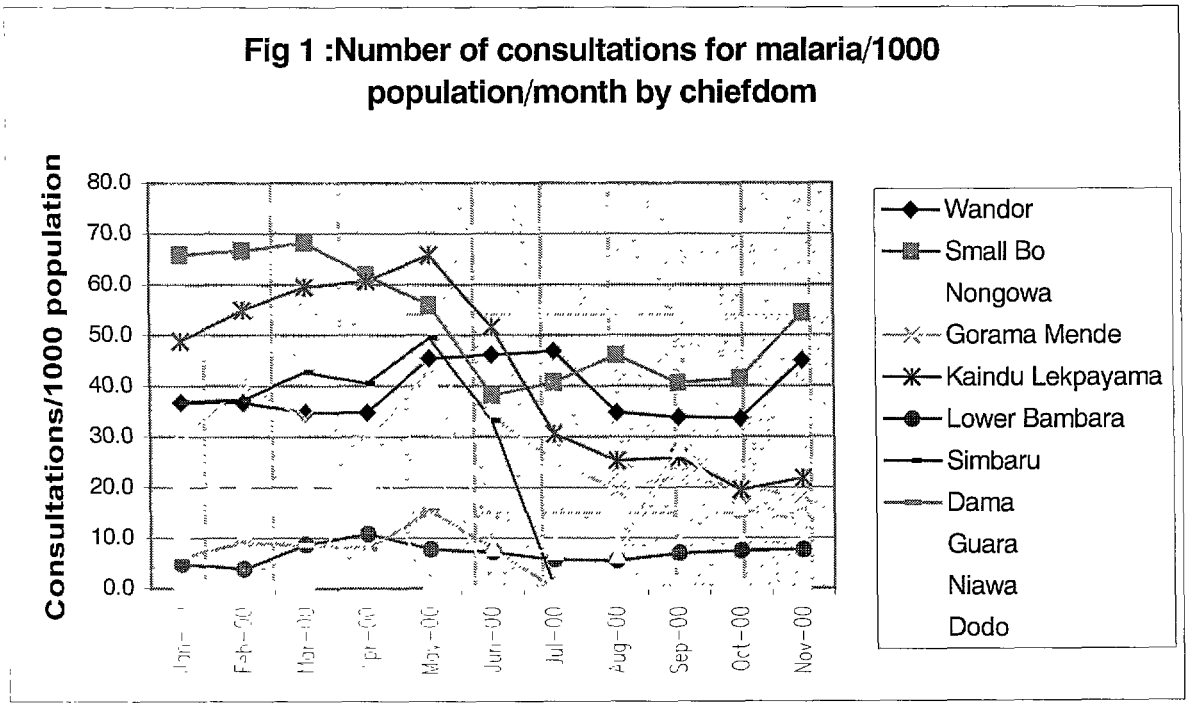
TABLE 1 continued: ***Consultation rates/person/year in Chiefdoms with Merlin supported PHUs***

Chiefdom	Simbaru	Dama	Niawa	Dodo	TOTAL
Total Pop	11271	50282	7624	14971	522258
Total <5	1916	8548	1296	2545	88783
Clinic	**Boajibu**	**Geima**	**Sendumei**	**Kundorma**	
Number of months supported	6 mths	6 mths	6 mths	9 mths	12mths
<5 consultations	2438	2418	12901	4000	**148773**
>5	1912	872	11346	1978	**102010**
ANC	1214	1038	4471	638	**46339**
Total	**5564**	**4328**	**27478**	**6616**	**294605**
estimated full 12 months figures					
<5	4876	4836	25802	5333	191113
>5	3824	1744	22692	2637	138511
ANC	2428	2076	8942	851	64304
Total	11128	8656	54956	8821	389593

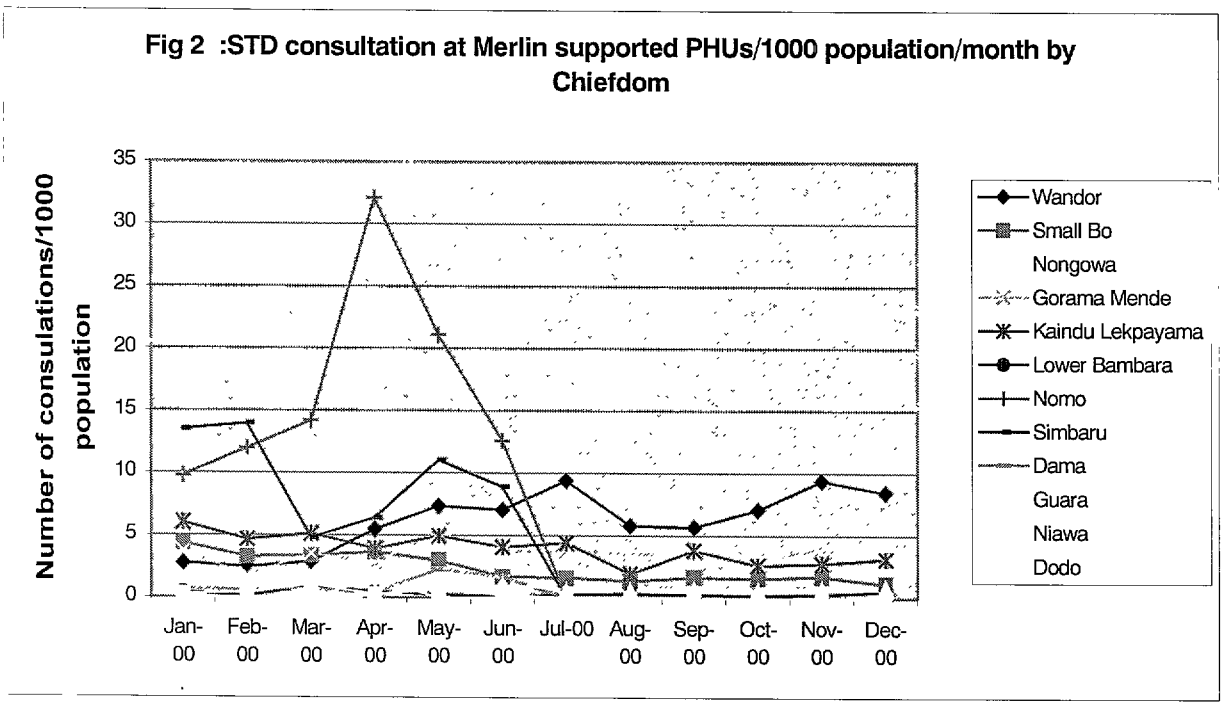
Table 2: No of consultations/person/year

Unadjusted	
<5	**1.675692419**
Total	**0.564098587**
estimated full 12 months figures	
<5	**2.152586054**
Total	**0.745978406**

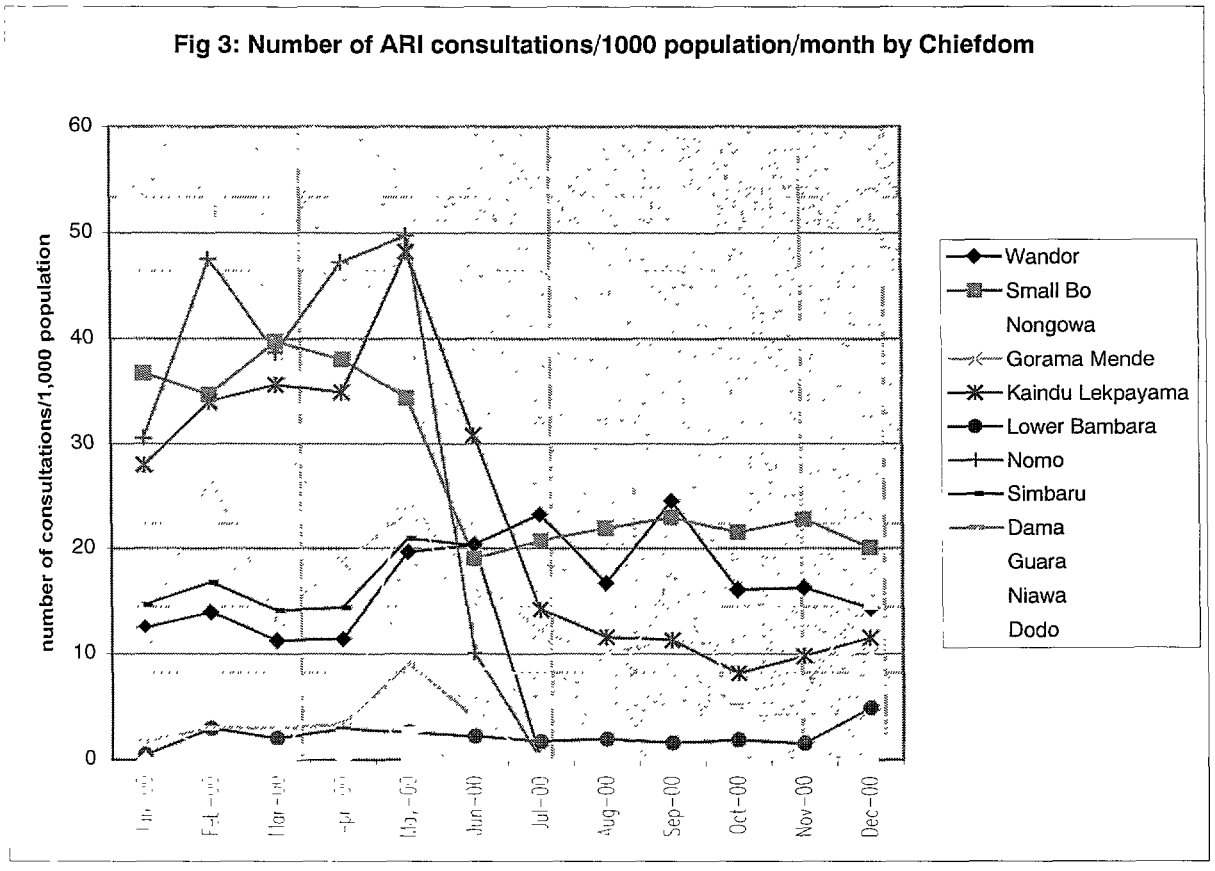
ANNEX 4: MORBIDITIES PER PHU
4a) Malaria



ANNEX 4: MORBIDITIES PER PHU
4b) STDs



ANNEX 4: MORBIDITIES PER PHU
4c) Pneumonia ARI



ANNEX 6: LASSA FEVER STATISTICS (July 99 to December 00)

Figure 1: Lassa Fever Unit: Admissions and deaths of suspected Lassa fever patients, Sept-99 to dec-00.

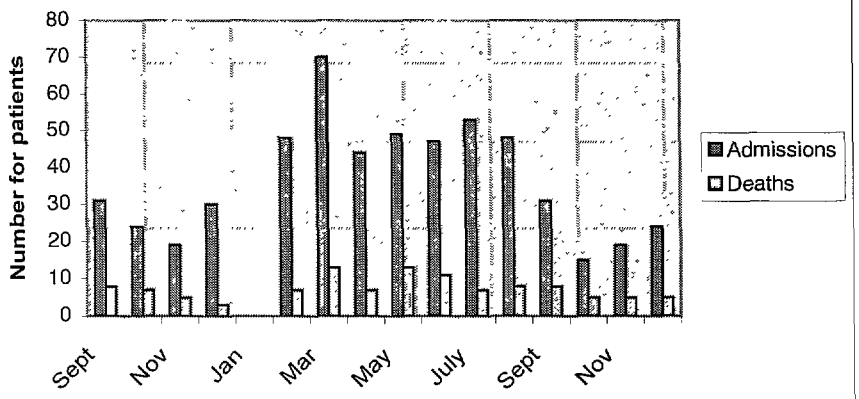


Figure 2: Admission trends to the Lassa Fever Unit by sex of suspected Lassa Fever cases, Sept-99 to Dec-00

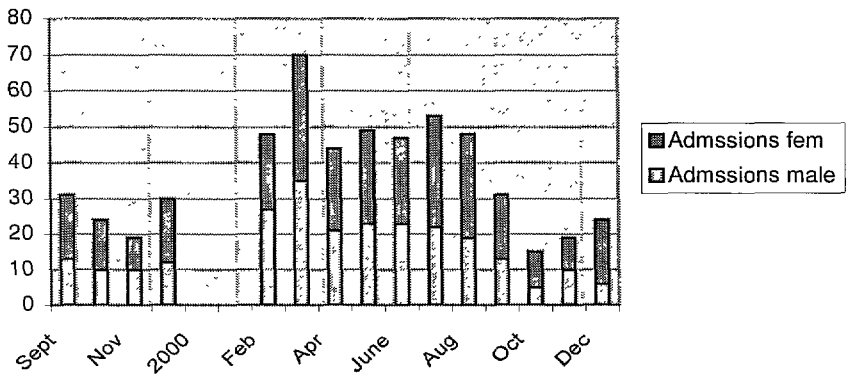
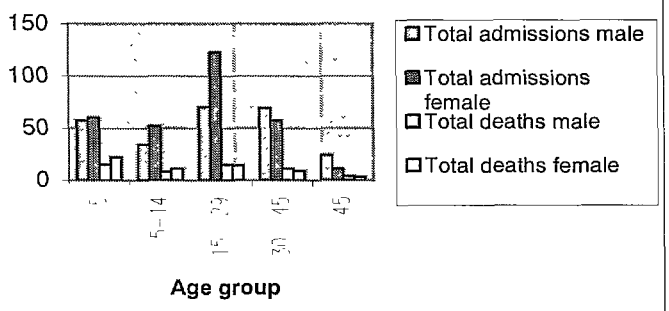
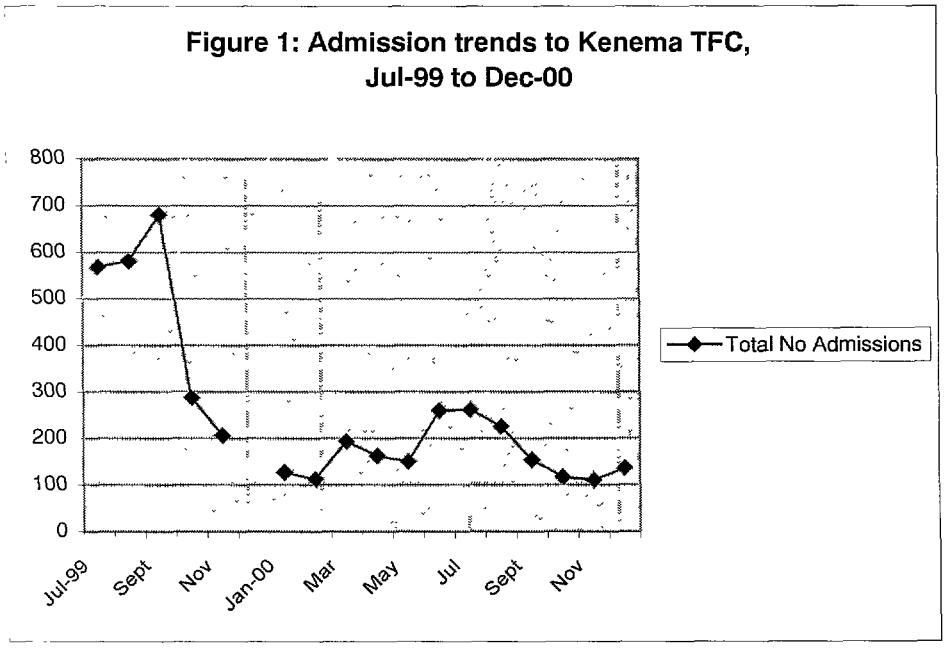
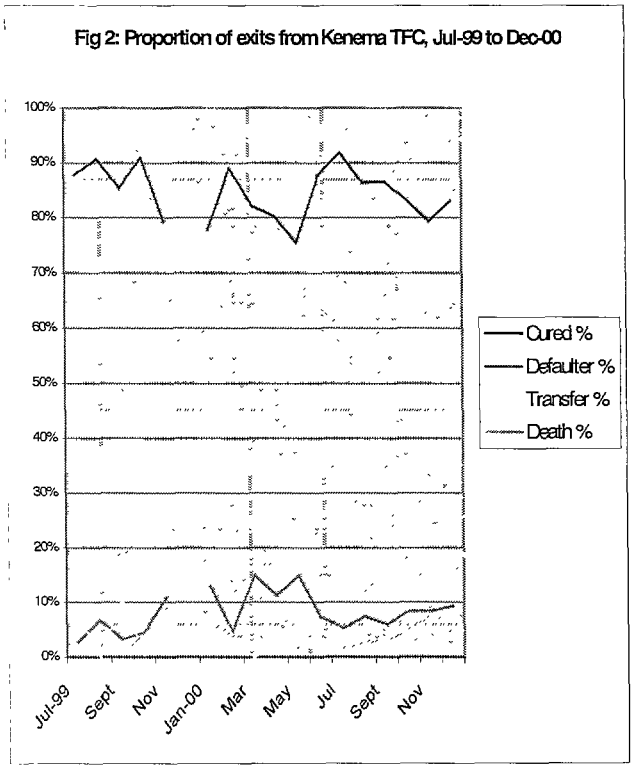


Fig 3: Lassa Fever Admissions and Deaths by age group and sex. Sept-99 to Dec-00.

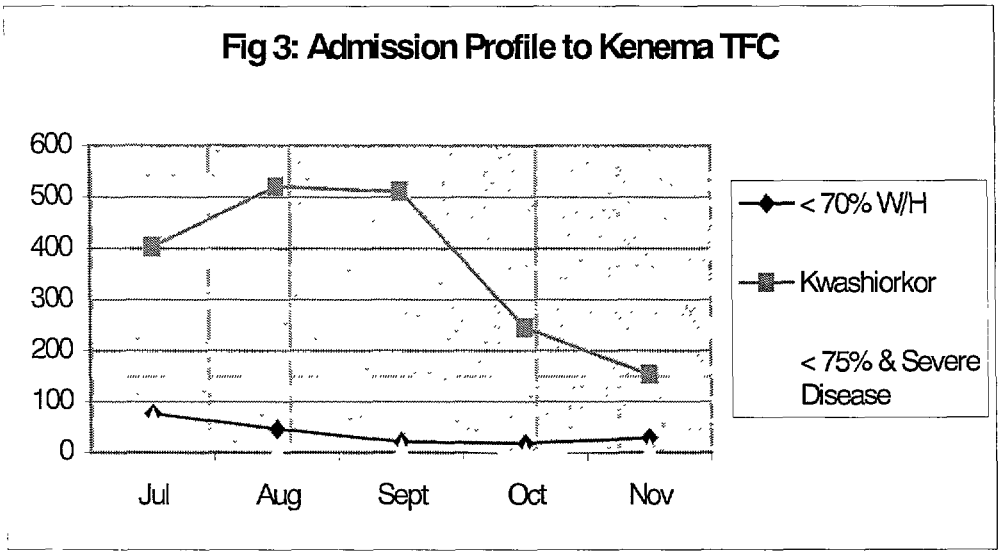


ANNEX 7: THERAPEUTIC FEEDING CENTRE STATISTICS (July 99 to December 00)

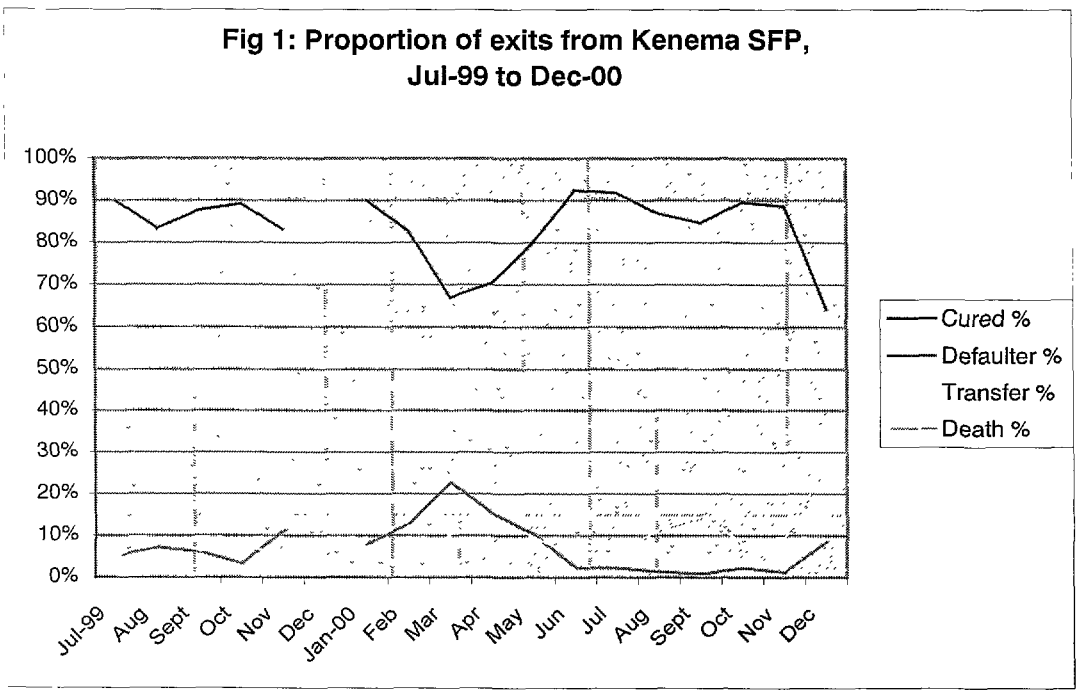


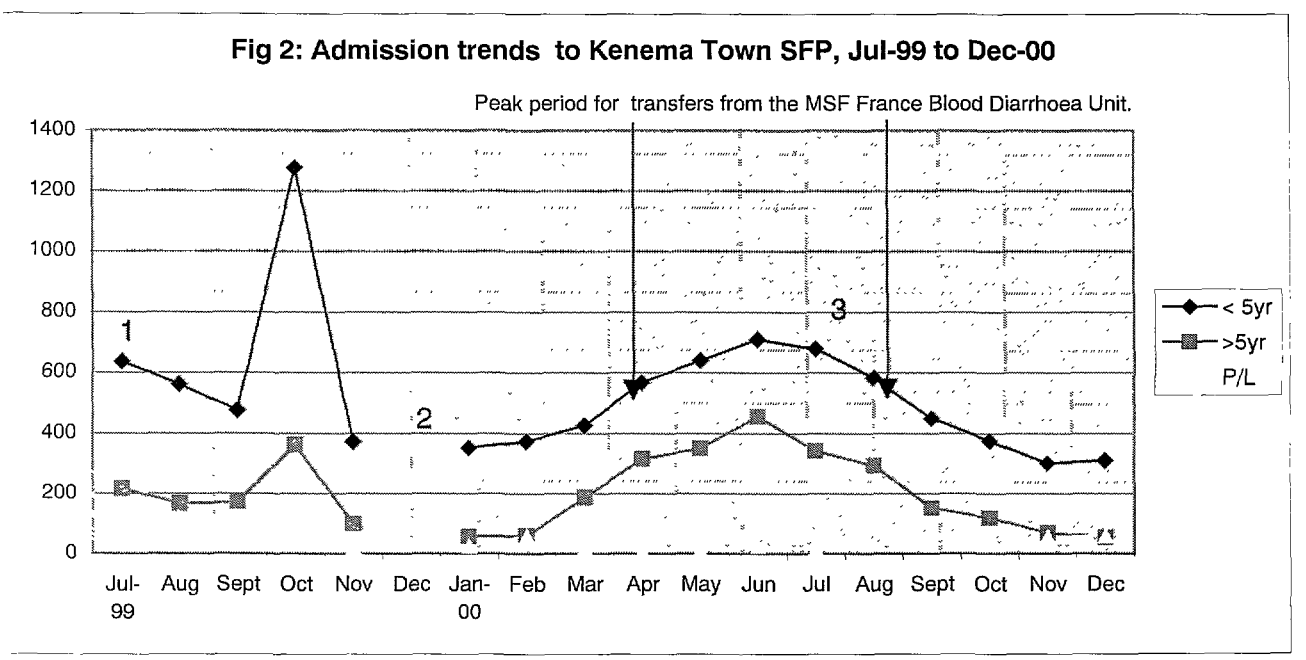


ANNEX 7 continued: THERAPEUTIC FEEDING CENTRE STATISTICS (July 99 to December 00)



ANNEX 8: SUPPLEMENTARY FEEDING PROGRAMME (July 99 to December 00)





ANNEX 9:

merlin
Medical Emergency Relief International

4 Frazer Davies Drive
Off King St, Congo Cross
Freetown, Sierra Leone.
Telephone: 23 1738 Fax: 23 1531
E-mail : freetown@merlin.org.uk

NEWTON MALARIA PREVALENCE SURVEY REPORT
KOYA RURAL DISTRICT, WESTERN AREA
OCTOBER 2000

1.0 EXECUTIVE SUMMARY

MERLIN conducted a random cross sectional malaria survey in Newton camp and Village as part of the Merlin/Oxfam Newton Malaria Control Project. The total male population comprised 35% (192) and females 65% (359). Children under five years of age represented 25% (135) of the total sample surveyed. *Plasmodium* prevalence in the two areas was 41% as measured by test-cards sensitive for *P. falciparum* & *P.vivax* (ICT Malaria P.f/P.v. AMRAD) no *P.vivax* was detected. There was no significant difference in the *P.falciparum* prevalence between the camp and the village. Overall positive values were 40% and 43% respectively. Malaria prevalence was highest in children under five years of age (74.5%) and lowest in adults over 50 years (28%).

2.0 GENERAL BACKGROUND

Sierra Leone is emerging from a brutal and protracted civil war with the attendant adverse effects on the socio-economic and health status of the people, in addition to collapse of infrastructures. Sixty percent of the country remains under rebel control and from these areas a large proportion of the population has become internally displaced and has overwhelmed the coping mechanisms of the host population. As a consequence, large numbers of Sierra Leoneans live in large overcrowded IDP camps, particularly in the provinces.

The people of the Koya Rural District have not been exempt from the atrocities of the war. Many people have been forced to abandon their homes to preserve their safety. The large numbers of IDPs has meant that the camps have had to be sited on large areas of environmentally hostile terrain. This, combined with inadequate sanitation, has resulted in increases in mortality and morbidity due to communicable diseases and malaria. Particularly affected are vulnerable groups such as children under five years of age, pregnant women and the elderly, whose immunity may not be developed or which may be weakened. The poor health status of the population is further aggravated by the fragile nutrition status of the majority of the people due to fluctuations in food supplies.

3.0 SURVEY OBJECTIVES

- To determine the prevalence of malaria in the Newton Area of the Koya Rural District.
- To determine the most vulnerable groups by age, sex and location.

- To examine the knowledge, attitude and malaria control practices of the inhabitants of the camp and village community

4.0 METHODOLOGY

A random cross sectional malaria prevalence survey incorporating a short Knowledge Attitude and Practice (KAP) survey was carried out in Newton Area, Koya Rural District with a total population of approximately 41,000 (Merlin measles survey, Nov 1999). The prevalence survey was carried out in early October, post-rainy season. The target sample size was 600 people from both areas, which was designed to allow a confidence interval of 95% that the prevalence rates detected could be assumed to be representative of the wider Newton Population.

Malaria Prevalence Survey (Training)

A team of 15 experienced MERLIN health workers, six Oxfam staff and three members of the School of Community Health (where/what is this?) conducted the survey. A two day training workshop on malaria and survey techniques for malaria control was carried out prior to the exercise. In addition, 25 Camp Hygiene Promoters provided by Oxfam were taken through a one-day training workshop on malaria survey techniques. These workers were to be used for the registration of selected volunteers, the transfer of sick people to health facilities and the follow up of defaulters.

Parasitological Survey

Immunodiagnosis

The testcard method (ICT Malaria P.f/P.v. AMRAD) was chosen as a reliable and fast diagnostic tool for *P.falciparum*. Sensitivity of the dipstick test is over 99% according to AMRAD literature. How does this compare with other projects?? Are the testcard and dipstick the same thing? The laboratory staff were trained in the administration of the test and interpretation of results.

Malaria Knowledge, Attitude and Practice Survey

A KAP questionnaire was developed and pre-tested by the survey team on mothers in the Newton Displaced Camp Clinic. Were previous Merlin KAP studies considered/utilised? The KAP questionnaire was subsequently amended in line with the results of the pilot test. The KAP questionnaire (Annex 2) focused on questions examining the community's understanding and recognition of malaria as a disease, the vector, treatment practices and malaria prevention measures.

5.0 SURVEY IMPLEMENTATION

An awareness campaign was carried out by Oxfam prior to the survey and focussed on discussions with community elders. The objectives of the intended health survey were outlined in the meetings and specific survey activities outlined. The board of executives gave permission for the survey to be carried out. General information as to the commencement of a health survey was disseminated through community elders and health volunteers.

Recruitment of Camp Booths onto the cross sectional survey

Each area was divided into three or four clearly defined sections. Methodology from where? Random sampling was achieved by spinning a bottle on a flat surface at a central point within

each section. The direction of the top of the bottle was followed and every other booth/house in that direction was sampled until the boundary of the section was reached. The procedure was then repeated from the central point, until the desired sample size was obtained. Each home sampled was marked to prevent restudy.
At each booth or house, the surveyor recorded the total number of people normally living there, those present at the time and those, including children, that were absent. Each household member was marked with indelible ink and requested to report to the central desk in each area for further examination. Specially trained camp health volunteers assisted the household members in collecting children from school and following up other members of the household that were absent for the whole day. Printed notes were given to the head of the households sampled, indicating to the central survey team the number of people being sent from the household, the number of household members present and number of those not available.

Those people not present in the household at the time of the registration were given absentee forms, via the household head, and asked to report for examination on their return.

Parasitological tests and KAP survey administration

The central desk was staffed by Merlin health workers and students from the Department of Community Health. These people had previously undertaken training with Merlin. Age and sex of volunteers (household members??) were recorded, a finger prick sample was taken for ICT testing. The volunteers testing positive with the dipstick test were referred to the health center for treatment with chloroquine (according to national guidelines). Were there any severe cases?

The pre-tested KAP questionnaire on malaria was administered to each adult sampled, whilst waiting for ICT test results, by previously trained staff. In the case of children under 10 years of age, the KAP questionnaire survey was administered to the mothers or caretakers.

If a volunteer was found to be seriously sick (with diseases other than malaria?? Was there any bias likely due to this practice – after all the survey sought data on malaria prevalence?), they were excluded from the study and immediately referred to the clinic. For ethical reasons state how they were cared for.

ANALYSIS

Malaria prevalence data were analysed manually?? and all data on KAP was returned to the office (which office?) for analysis, hopefully with EPI info package. Strange sentence!

5.0 RESULTS

Demography

The total household population of the families surveyed at random in the three camps was 551 why not 600?(Table I). Of these approximately 50.3% (277) were from Newton Camp and 49.7% (274) from Newton village. The total male population comprised 35%(192) and females 65% (359). Children under five years of age represented 25% (135) of the total sample surveyed.

Table I. Demographic data on the population sampled in Newton Camp and Newton Village.

	Newton Camp	Newton village	Total

36

Male	106	86	192
Female	171	188	359
Total no. recruited	**277**	**274**	**551**
U5s	59	76	135
5 – 14 years old	49	57	106
15 – 49 years	94	103	197
Over 50 years	75	38	113

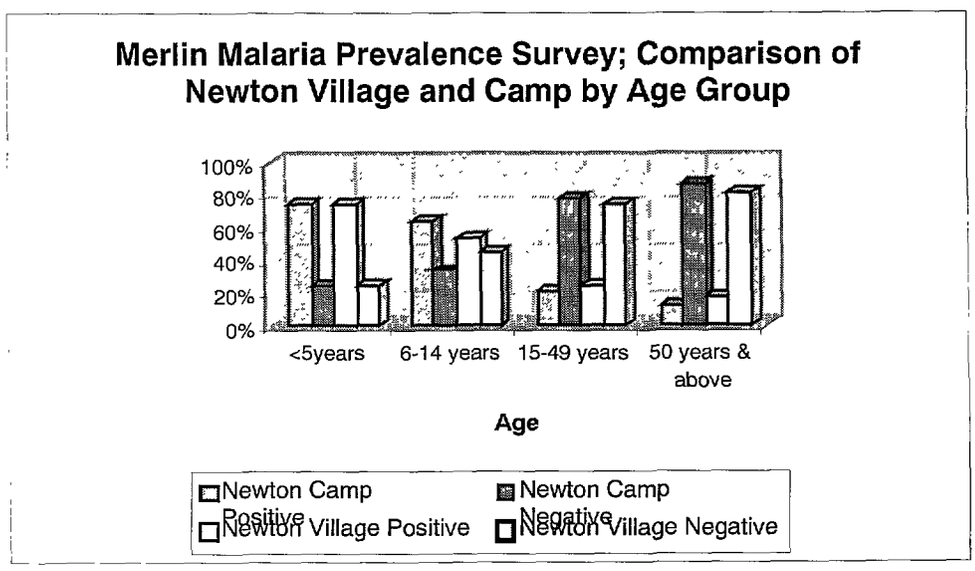
Malaria Prevalence

The overall *P.falciparum* prevalence in the three camps as measured by the dipstick was 41.4%(n = 551) Newton Village had a slightly higher prevalence rate of 44% than the camp at 39%. The difference between the prevalence rates for the two areas was not significant (p value?). In both areas, malaria prevalence was highest in children under five years of age (74.5%) and least in adults over 50 years (28%) as would be expected (Table II). Is this significant statistically?

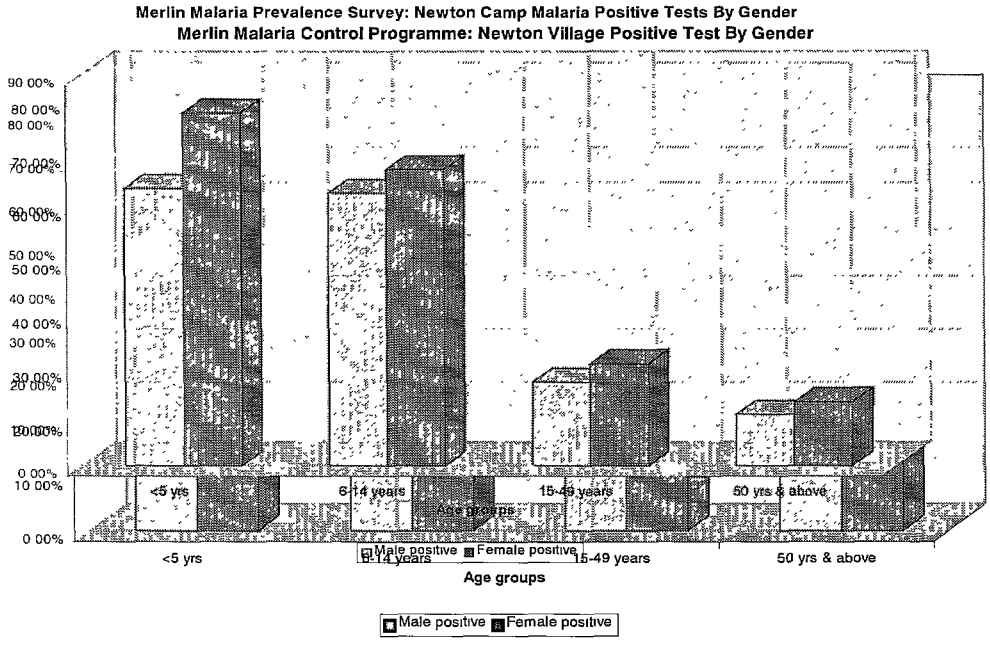
Table II. Malaria Prevalence By Age Group For Newton Camp & Village.

	Newton Camp		Newton Village	
	Positive	Negative	Positive	Negative
<5years	75%	25%	74%	26%
6-14 years	65%	35%	54%	46%
15-49 years	22%	78%	26%	74%
50 years & above	13%	87%	18%	82%

PLEASE USE THE SAME LAYOUT /SIZING ETC FOR EACH FIGURE BELOW. INCLUDE FIGURE NUMBERS INSIDE. Font sizes?



37



Discuss gender/age -any comments? Is there a statistical difference? If yes, why?
FIGURE III: Prevalence rates broken down by gender

CONSTRAINTS

- The study generated large scale interest in the camp population with large crowds of on-lookers gathering at the central administration point in each area. The resulting confusion caused delay in registration of bona fide camp households recruited into the study. Camp volunteers and elders were appointed to control the crowds.
- The central survey sites however were not always easily accessible or easily sectioned for crowd control.
- Misconceptions arose as to the purpose of taking blood from individuals, as part of the survey in spite of the awareness campaign carried out prior to the survey. Merlin outreach teams, drawing on their experience with the camp communities, were able to conduct further awareness meetings and clarify the situation. Talk about the pre-survey sensitisation, what was discussed and the further meetings.
- Some dipstick tests (Is there a detectable difference in the strength of the result? Why not use blood films as backup? Speed? Facilities?)for malaria measure malaria antigen presence within the red blood cells, this antigen may be retained for up to 14 days after successful treatment has been completed. This could mean that positive results on a dipstick test are not a true reflection of actual malaria prevalence at one point in time.

7.0 CONCLUSION

The results of this survey agree with previously published data showing that malaria is hyperendemic in Sierra Leone. The data on age and sex of patients also agree with previously published information. The most vulnerable individuals are children under five years of age as revealed by the high prevalence rate in this age group. Strategies for malaria control in the Newton area should focus on preventative strategies for malaria and the recognition and management of malaria in the community, particularly for children under 5 years of age.

On completion of the analysis of the malaria KAP survey, health education strategies may be (be more positive??) planned more effectively.

37

ANNEX 10:

NEWTON MALARIA CONTROL PROJECT
PRELIMINARY BASELINE DATA OBTAINED FROM ENTOMOLOGY SURVEY IN THE KOYA RURAL DISTRICT, WESTERN AREA

EXECUTIVE SUMMARY

Merlin, in collaboration with OXFAM, conducted an entomology survey in three locations of the Koya Rural District, Western Area as part of the Newton Malaria Control Project. Human bait collections were carried out in Newton Village, Fogbo and Songo. Relative proportions of *Anopheles* (which species?) mosquitoes among the general mosquito population were Newton Village (71.2%), Fogbo (73.6%) and Songo (33.8%). Parous rates range from Newton Village (85.9%), Fogbo (66%) and Songo (73.4%). Although there was some variation in the relative proportions of *Anopheles* caught in the three different locations and there was only a slight variation in parous rates, there was no significant variation in the biting peak times for all three areas.

GENERAL BACKGROUND

People have been forced to leave their villages and abandon their homes for safety reasons as the war spread to the Western Area of Sierra Leone. As a result the people of the Koya Rural District, in the Western Area, have been exposed to diseases such as malaria and communicable diseases because of poor sanitation, poor housing and numerous bites from mosquitoes.

The Newton IDP Camp was opened to cater for displaced people through the provision of temporary shelter. Merlin has been assisting the MoHS to provide medical facilities for this community and in the past have established mobile medical facilities to people in less accessible areas. However, malaria has continued to be a threat to these communities.

Due to the high levels of transmission of malaria and vulnerability of the population Merlin & Oxfam approached The National Malaria Control Programme for permission to undertake preliminary studies on prevalence of malaria and entomology studies. This data was to form the basis of a collaborative malaria control programme, in accordance with The Roll Back Malaria Strategy.

This report is as a result of the entomology survey carried out in the Newton Area of Koya rural District, Western Area.

INTRODUCTION

Malaria is transmitted by mosquitoes of the genus *Anopheles* (Ross, 1897). Of the 23 different species of *Anopheles* mosquitoes found in Sierra Leone, only two are true vectors of malaria. Blacklock and Evans(1926), Christophers and Puri(1931b), Davey(1939, 1945), Evans(1926), Lewis(1956b), Muirhead-Thompson(1945B.M.). These are *Anopheles gambiae* and *Anopheles funestus*. Mosquitoes of the *Anopheles gambiae* complex have freshwater and coastal forms, *species A & B* for the freshwater forms and *Anopheles melas* for the coastal form.

Anopheles gambiae:

Anopheles gambiae breeds in different types of water, the most common being the shallow sun-lit pools, which become abundant during the rainy season. Rice fields also constitute another important prolific source of *Anopheles gambiae*, this habitat produces most mosquitoes when recently flooded and the rice is low, Muirhead-Thompson (1945), Bruce-Chwatt (1954), Grainger (1947).

In some areas seasonal changes occur in the type of sites where larvae are found, this is usually linked to the water available. Christie (1959) found that temporary pools, in which larval survival was high, were available for short periods only. During the rest of the year the species had to be content with less favourable conditions in wells and swamps. Seasonal changes in *A.gambiae* populations tend to follow the pattern of rainfall. Where there is a single rainy season, numbers start to rise soon after the first main falls. A peak is reached in the middle of the rains and numbers then decline steadily as the water level becomes stabilised and vegetation and predators become established. Gordon et al. (1932) reported this pattern for Sierra Leone.

As with many mosquitoes, the flight range of *A.gambiae* from breeding sites varies considerably with local topography. This range rates from 1-1 ½ miles (1 ½ -2 ½ km) Jepson et al. (1947) to 2-4 miles (3-6 ½ km) Adams (1940). *A.gambiae* is largely anthropophilic, but studies carried out by Bruce-Chwatt and Gorkel (1960) and Garret-Jones (1964) showed that it is less specific in its feeding habits. However, recent blood meal ELISA studies carried out in Sierra Leone found about 90% positive for human blood (Magbity et al.1996.)

When looking at transmission, sporozoite rates were also found to be 6% in the Bo Northeast, Southern Province by Bockarie et al. (1993). In addition *A.gambiae* plays an important role in the transmission of bancroftian filariasis and o'nyong- nyong fever.

Anopheles funestus

This is an important vector, closely adapted to man in many aspects of its behaviour. This mosquito is strongly anthropophilic species known to attack man even in the presence of cattle. It feeds mostly in the second part of the night when people are indoors and shows a lesser tendency to feed outdoors than any other African Anopheles, Smith (1955c).

A number of observations have suggested that in inhabited areas most *A.funestus* populations stay within short distances from favourable breeding sites. Jepson et al. (1954) showed that they hardly flew over 1 mile. On the other hand, in open country where sources of food and oviposition sites are widely scattered, females appear to cover greater distances. Hopkins (1941) showed that regular

two-way flights of 2 miles from the shores of Lake Victoria must have been taking place, while Hammon, Adam and Grjebine (1956) found similar flights of 2-3 miles (3-5 Km) in a savannah area of Upper Volta.

Sporozoite rates in Sierra Leone range from 4.1%, Gordon (1932) to 12%, Bockarie et al. (1993,) reflecting the increasing transmission of the disease over time. *Anopheles funestus* also plays an important role in the transmission of bancroftian filariasis with a positive infective larvae rate of 1.2% in Sierra Leone, Gordon et al. (1932).

Anopheles melas

This is the West Coast member of the *Anopheles gambiae* complex and differs from the freshwater form by its characteristic dark appearance. In some cases they have four-banded plaps.
A. melas is broadly found in two situations, (See page 6) firstly it occurs in patches of salt grass (*paspalum*) in tidal swamps and in pools, ponds and lagoons flooded by spring tides. Secondly, it occurs within the mangrove belt in the *Avicennia* orchards, which may cover enormous areas, Gilles and DeMeillon (1968). In Lagos and Liberia the former type predominates, Barber and Olinger (1931), Muirhead-Thompson (1948) and Gelfand (1955a.) While in Freetown and Gambia, the overwhelming majority of breeding takes place in the Avicennia orchards, Muirhead-Thompson (1945) and Giglioli (1964a).
This species is capable of thriving in waters of high salinity.

As in *A.gambiae,* the developmental cycle in *melas* is rapid. The eggs hatch out in 1-2 days and the larval and pupal stages may be completed in 4-5 days. Populations of *melas* are notoriously unstable, and very wide fluctuation in numbers is a characteristic of this species. In Sierra Leone, Ribbands (1944c) found that long-term fluctuations were dependent on rainfall, while short-term variations were tidal in origin. Adults do not seem to disperse far from the neighbourhood of saline habitats and do not fly over 1-1 ½ mile (2 ½ -3 km) from breeding sites, Gelfand (1955a.)

Observations by Muirhead-Thompson (1948) and Gelfand (1955a) have shown that even in the presence of other domestic animals *A.melas* still strongly attacks man. *A. melas* appears to feed as easily indoors as out. Parous rates were lower in females resting outside houses with an average rate of 25-33% suggesting that most young *A.melas* mosquitoes rest outdoors.

Barber and Olinger (1931) first established *A.melas* as an important vector of malaria in many areas along the West African coastline. In certain localities it may be the main vector for all except the wettest months of the year. Although its sporozoite rate is lower than in *gambiae,* its numbers are very much higher. However it has been shown that melas is as equally or almost as susceptible to infection as *gambiae.* Tendre (1964) recorded a sporozoite rate of 4.2% in Sierra Leone.

A. melas is also capable of transmitting bancroftian filariasis, at an even higher rate than *A.gambiae.*

AIMS & OBJECTIVES

The aim of this survey was to obtain entomology baseline data about the vector ecology of *Anopheles* mosquitoes in the Koya Rural District.
The objective include:

- To examine the relative population of different mosquito species.
- To determine the peak biting times of the *Anopheles* populations
- Assess parous rates of *Anopheles species.*
- Assess their sporozoite rates.

THE STUDY AREA

The Koya Rural District is about 25km from Freetown and lies at longitude 8°21'N and latitude 13° W of Sierra Leone. This area also has an altitude of less than 50 metres above sea level and receives about inches of XX rain every year.

The total population of the area is about 41,000 (Merlin measles survey 1999) in 92 villages. Recent EPI statistics showed that 4,841 children under five years were covered. There are four health posts, which have been rendered non-functional as a result of the war, a temporary facility has been established within the camp. Schools in the area are now trying to restart activities following a reduction in fighting in the area.

The occupationsof these communities include gardening, charcoal selling, fishing, palm wine selling, wood selling, petty trading and farming. An abundance of mosquitoes have been locally reported with breeding sites identified as marshy areas, inland swamps, old and abandoned water wells and shallow pools of water.

Selection of Sites to Conduct The Survey

Based upon previous health assessments by Merlin, three villages were selected in which to carry out the survey. Out of these, one village was to serve as control. This is indicated below:

SELECTED AREA	POSITION IN STUDY
NEWTON VILLAGE	EXPERIMENTAL
FOGBO	EXPERIMENTAL
SONGO	CONTROL

TABLE I: Selection of areas and anticipated type of activities.

Newton Village

This area is located about 25km from Freetown. Most of the land in this area is covered with swamp inlets and other areas are marshy. There is only one functional health centre and this is located within the Newton Displaced Camp. Merlin has supported this health centre, since its inception one year ago, to provide Medicare for IDPs and the surrounding 92 villages. About 30 unlicensed drug sellers practice in this area.
There are two Primary Schools and one Secondary school in this area.

Fogbo
This town is located about 10km Southeast from Newton village. However, this is a coastal region. There is a non-functional health facility in this village, destroyed as a result of the war. Occupations of adults are fishermen, fishmongers or farmers, due to its easy access to the Atlantic Ocean, it has served as an important business centre for local fishermen.
There is a primary school in this region serving three villages.

Songo
This town is about 12 km East of Newton Village. This area can be described as an intermediary between marshy and inland swamp areas. While most people are subsistence farmers and woodcutters, some still continue fishing as an occupation.
This town was recently rehabilitated, as the town had previously been abandoned due to insecurity. Both the Primary and Secondary Schools have just recently resumed activities. The health centre here is non-functional and people travel to Newton to receive healthcare.

MATERIAL AND METHODS (SURVEY METHODOLOGY)

This survey was conducted from the 26th November 2000 to the 15th December 2000 excluding Saturdays and Sundays. Five-day collections were carried in each of the three areas.

Staff of the Medical Entomology Laboratory (MoH&S) were utilised as field workers for the survey Training?? Reliability??. A Merlin Supervisor and 9 members of MoH&S staff undertook Human Bait Collections (HBC) in each of the 3 areas. Ethics? Was prophylaxis given?

HBC was achieved by two people sitting with bare legs and collecting the mosquitoes after they had landed on them (from each other?). Mosquitoes were caught using 10ml glass tubes with the aid of a flashlight. Hourly catches from 19:00 hours to 07: 00 hours were recorded by the supervisor. The team worked at 3-hour intervals. This gave each team member ample time to rest before returning to duty.

Collected mosquitoes were transported to the laboratory the following morning for routine identification, separation and dissection. This activity was later transferred to the Merlin office because of power cuts. *Anopheles* mosquitoes were dissected under a Nikon Dissecting microscope and their ovaries examined using a BH2 Olympus Phase Contrast Microscope.

Determination of parity rates was carried out according to the method described by Detinova (1969). Parous and nulliparous rates were recorded for further analysis. All heads and thoraxes have been cryopreserved for future sporozoite ELISA tests using the standard WHO kit when these materials become available. (Why were these not available for the study?)

RESULTS

AREA	DATES	ANOPHELES – can we break this down into gambia/funestus?	CULICINES	TOTAL
NEWTON	27th Nov. –1st Dec	262	106	368
FOGBO	4th – 8th Dec	1825	654	2479
SONGO	11th – 15th Dec	199	390	589
TOTAL	**15 DAYS**	**2286**	**1150**	**3436**

TABLE II: Relative proportion of mosquitoes collected via Human bait Collection - absolute numbers

AREA	ANOPHELES CAUGHT	NUMBER DISSECTED	PERCENT PAROUS
NEWTON	262	262	85.9
FOGBO	1825	250	66
SONGO	199	199	73.4

T ABLE III: Parity rates in Anopheles mosquitoes for three locations - as determined from dissections. It was noted during dissection that over 75% of Anopheles from Fogbo were *melas* form.

I have deleted the 2 graphs that were inserted as they covered the text/made changes impossible and you could not read what was underneath. Please insert them differently – i.e. not over the text! It is better if you do paste special and then attach as an excel file – then if there is a problem I can change it from this end).

FIG 2: Absolute numbers of Anopheles biting at hourly intervals.

DISCUSSION

From the findings in table II, Fogbo has more mosquitoes than in any of the study areas. Most (Avoid being subjective –what percentage??) of the mosquitoes caught were found to be dark forms of the *Anopheles gambiae* complex and the number of mosquitoes caught were high (Again – avoid being subjecive – how many??). These findings agree with earlier findings from Gilroy (1948) to be populations of *Anopheles melas*. This was expected as saltwater marshes form the majority of breeding sites in this area. However, this did not exclude the presence of other freshwater species.

In Newton and Fogbo more *Anopheles* mosquitoes were collected than *culicines*, (71% & 74% *Anopheles* against 29% & 26% *Culicines*, respectively) (Tabulate) this situation is the reverse for Songo (34% *Anopheles* against 66% *Culicines*.) It appears from this study that Culicines are more predominant in Songo than any of the other areas, this will require further study in the future. (Any possible reasons?)

When considering the large number of mosquitoes caught at Fogbo, it was found that they still had the lowest parous rate, In the research reviewed *A.melas* has been shown to have low parity rates, this study's findings are higher than those recorded in previous literature. These differences may be attributed to tidal variations (Why?).

There was no significant variation in the biting peaks of mosquitoes related to people's sleeping patterns, within the three study areas. Increase in biting activity for *Anopheline sp.* commenced around 23:00 hours and reduced at 05:00 hours. However this was a more gradual increase for Newton & Songo and more pronounced in Fogbo, where there were more *melas* located. This indicates that biting activity rises when people go to bed and is in accordance with the anthropophilic habits of the established vectors.

Finally, variations in morbidity rates reported to Newton clinic show that malaria is unstable in the Newton area, this could be attributed to a highly mobile population and regular influxes ?population ones?

CONCLUSION:

The above survey findings illustrate the high numbers of malaria vectors prevalent in the study area. It also shows them to be largely parous and so likely to transmit higher levels of malaria. Given the antropophilic nature of these vectors and their peak biting habits of between 23:00 and 05:00, protective malaria control strategies would be indicated, especially in the form of insecticide treated nets (ITNs)for sleeping under.

In the majority, flying distances of these vectors are short and the density of population high, so vector control measures such as destroying breeding sites are likely to have a high impact on transmission rates. The need for community involvement in such interventions is well documented.

It is therefore proposed that Merlin & Oxfam undertake a collaborative malaria control programme in accordance with and agreement of the National Malaria Control Programme. To address personal

protection issues, reduction of vector density, community involvement in reducing breeding sites and encouraging prompt treatment seeking behaviour, to reduce the infective pool.

ACKNOWLEDGEMENTS

Sincere gratitude and appreciation goes to Dr Noah Conteh, Director General of Medical Services, MoH&S and also to Dr Sarian Kamara, Manager, National Malaria Control Programme, MoH&S for all the help and approval they gave us to carry out this survey.

We also thank Dr Edward Magbity, School of Community Health, Fourah Bay College, Freetown, for his invaluable assistance towards the successful accomplishment of this survey.

Thanks also go to Mr Andrew Massaquoi, CHO, Newton Health Centre for all the help given to the team during the entire period of the survey.

Finally, we wish to thank all members of the Entomology Unit who took part in this survey.
This survey was conducted as part of the Newton Malaria Control funded by the OFDA.

REFERENCES

Bockarie et al. (1993). Malaria in the Rural Area of Sierra Leone – Vector Ecology. Transactions of the Royal Society of Tropical Medicine and Hygiene.

D. Chavasse, C. Reed, K. Attawel (1999). Insecticide Treated Net Projects: A Handbook For Managers. Malaria Consortium.

Gilles and DeMeillon (1968). The Anophelinae of Africa: South of the Sahara. (Ethiopian Zoogeographical Region). The South African Institute of Medical Research.

Giglioli (1964a). Tides, salinity and the breeding of Anopheles melas Theobald (9103) during the dry season in Gambia. Riv. Malar., 43: 245. Cited in Gilles and DeMeillon (1968). The Anophelinae of Africa: South of the Sahara. (Ethiopian Zoogeographical Region). The South African Institute of Medical Research.

H.M. Gilles & D.A. Warrel (1996). Bruce-Chwatt's Essential Malariology (Third Edition).

J.A. Najera. Malaria Control among refugees and displaced populations, WHO/CTD/96.9.

WHO Expert Committee on Malaria. (Geneva 2000), Twentieth Report. WHO Technical Report Series 829.

Lewis (1956b). The medical entomology of the Tonkolili Valley, Sierra Leone. Ann. Trop. Med. Parasit., **50**: 299. Cited in Gilles and DeMeillon (1968). The Anophelinae of Africa: South of the Sahara. (Ethiopian Zoogeographical Region). The South African Institute of Medical Research.

Christie (1959). A critical review of the role of the immature stages of anopheline mosquitoes in the regulation of adult numbers, with particular reference to Anopheles gambiae. Trop. Dis. Bull., 56: 385

Cited in Gilles and DeMeillon (1968). The Anophelinae of Africa: South of the Sahara. (Ethiopian Zoogeographical Region). The South African Institute of Medical Research.

Jepson et al. (1947). The malaria problem in Mauritius: the bionomics of Mauritian anophelines. Bull. Ent. Res., 9: 325. Cited in Gilles and DeMeillon (1968). The Anophelinae of Africa: South of the Sahara. (Ethiopian Zoogeographical Region). The South African Institute of Medical Research.

Bruce-Chwatt and Gockel(1960). A study of the blood-feeding patterns of Anopheles mosquitoes through precipitin tests. Bull. Wld. Hlth. Org., 22: 685. Cited in Gilles and DeMeillon (1968). The Anophelinae of Africa: South of the Sahara. (Ethiopian Zoogeographical Region). The South African Institute of Medical Research.

Incomplete

References need to be completed

Emergency health support programme Sierra Leone
MERLIN
Time Frame: 16 Months
Start: 26/07/1999
End: 01/12/2000
Award No. AOT-G-00-99-00219-00
Objective I: The reduction of mortality and morbidity in the resident and displaced populations in Kenema Town and District
Objective II: To re-establish essential health care to the resident and returning population of Kenema District
and Town through existing MoH structures where possible
Freetown through provision of health care.
Objective III:The reduction of mortality and morbidity in the vulnerable displaced and resident population of Kenema Town and

(All figures in US$)

Rate $/£ : 1.533939

OBJECTIVES

LINE ITEM	New Budget US$	Actual expenditure 26 Jul 99 - 30 Sept 00	Funds Received Todate 26 Jul 99 - 30 Sept 00	Reimbursement Request 1 Oct '00 - 1 Dec 00	Total Expenditure 26 Jul 99 - 1 Dec 00
1. INTERNATIONAL STAFF	396,940	299,518	299,518	14,929	314,447
2. NATIONAL STAFF	217,585	230,948	230,948	-26,449	204,499
3. TRAVEL	79,575	52,725	52,725	4,798	57,523
4. EQUIPMENT	621,257	478,230	478,230	16,270	494,501
5. TRANSPORT	307,950	310,946	310,946	18,271	329,217
6. OFFICE COSTS	99,470	97,363	97,363	9,806	107,169
7. WAREHOUSING	39,000	33,017	33,017	-506	32,510
8. MISCELLANEOUS	64,500	24,864	24,864	5,482	30,346
TOTAL DIRECT COSTS 1,2,3,4,5,6,7,8	1,826,277	1,527,610	1,527,610	42,602	1,570,212
ICR @ 12.5% OF TOTAL DIRECT COSTS	228,285	190,951	190,951	5,326	196,277
TOTAL BUDGET	2,054,562	1,718,561	1,718,561	47,927	1,766,488

Calculation of weighted average rate for the conversion of expenses from HQ currency into USD

Date	Received from OFDA (USD)	Exchange rate		Equivalent in HQ currency (GBP)
4-Nov-99	575,421	1.612374	(A)	356,878
6-Jun-00	136,000	1.503212	(B)	90,473
7-Jun-00	175,583	1.503212	(B)	116,805
7-Jun-00	88,396	1.503212	(B)	58,805
14-Jun-00	800	1.503212	(B)	532
31-Jul-00	104,453	1.508293	(C)	69,252
31-Jul-00	297,020	1.508293	(C)	196,925
29-Aug-00	126,147	1.508293	(C)	83,636
14-Feb-01	214,741	1.460305	(D)	147,052
Total	1,718,561	1.533939		1,120,358

(A) Dollar rate applied by HQ bank in November 99
(B) Dollar rate applied by HQ bank in June 00
(C) Dollar rate applied by HQ bank in August 00
(D) Dollar rate applied by HQ bank in February 2001

Financial Status Report

(Short Form)

(Follow instructions on the back)

1. Federal Agency and Organizatinoal Element to Which Report is Submitted	2. Federal Grant Or Other Identifying Number Assigned By Federal Agency	OMB Approval No. 0348-0039	Page	of
USAID / OFDA	AOT-G-00-99-00219-00		1	pages 3

3. Recipient Organization (Name and complete address, including ZIP code)

MERLIN, 5-13 Trinity Street, Borough, LONDON, SE1 1DB, United Kingdom

4. Employer Identification Number	5. Recipient Account Number or Identifying Number	6 Final Report	7. Basis
	SN23/6	[X] YES [ ] NO	[X] CASH [ ] ACCRUAL

8. Funding/Grant Period (See instructions) From: (Month, Day, Year)	To: (Month, Day, Year)	9. Period Covered by this Report From. (Month, Day, Year)	To: (Month, Day, Year)
July 27, 1999	December 1, 2000	October 1, 2000	December 1, 2000

10. Transactions:	I Previously Reported	II This Period	III Cumulative
a. Total outlays	1,718,561	47,927	1,766,488
b. Recipient share of outlays			
c. Federal share of outlays	1,718,561	47,927	1,766,488
d. Total unliquidated obligations			
e Recipient share of unliquidated obligations			
f Federal share of unliquidated obligations			
g. Total Federal share (sum of lines c and f)			1,766,488
h Total Federal funds authorised for this funding period			2,054,562
i. Unobligated balance of Federal funds (Line h minus line g)			288,074

11. Indirect Expense	a. Type of Rate (Place "X" in appropriate box)			
	[ ] PROVISIONAL	[ ] PREDETERMINED	[ ] FINAL	[X] FIXED
	b. Rate	c. Base	d. Total Amount	e. Federal Share
	12.50%	1,570,212	196,277	196,277

12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation

13. Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquated obligations are for the purpose set forth in the award documents

Typed or Printed Name and Title	Telephone (Area Code, number and extension)
JOE WALKER - HEAD OF FINANCE	(+44) 020 7378 4822
Signature of Authorized Certifying Official	Date Report Submitted
	February 28, 2001

NSN 7540-01-218-4387

269-201

Standard Form 269A (Rev 4.8)

Prescribed by OMB Circulars A.102 and A.103

50

REQUEST FOR ADVANCE OR REIMBURSEMENT (See instructions on back)	Approved by Office of Management	PAGE 2 OF pages 3
	1 TYPE OF PAYMENT REQUESTED — a "X" one, or both boxes [ ] ADVANCE [X] REIMBURSEMENT; b "X" the applicable box [X] FINAL [ ] PARTIAL	2 BASIS OF REQUEST [X] CASH [ ] ACCRUAL

3 FEDERAL SPONSORING AGENCY AND ORGANIZATIONAL ELEMENT TO WHICH THIS REPORT IS SUBMITTED	4 FEDERAL GRANT OR OTHER IDENTIFYING NUMBER ASSIGNED BY FEDERAL AGENCY	5 PARTIAL PAYMENT REQUEST NUMBER FOR THIS REQUEST
USAID / OFDA	AOT-G-00-99-00219-00	SN23/6

6 EMPLOYER IDENTIFICATION NUMBER	7 RECIPIENT'S ACCOUNT NUMBER OR IDENTIFYING NUMBER	8 PERIOD COVERED BY THE REQUEST FROM (month, day, year)	TO (month, day, year)
	SN23/6	October 1, 2000	December 1, 2000

9 RECIPIENT ORGANIZATION		10 PAYEE (Where check is to be sent is different than item 9)
Name	MERLIN (Medical Emergency Relief International)	Name See attached the bank number
Number and street	5-13 Trinity Street Borough	Number and street
City, State and ZIP code	LONDON SE1 1DB UNITED KINGDOM	City, State and ZIP code

11 COMPUTATION OF AMOUNT OF REIMBURSEMENTS/ADVANCES REQUESTED

PROGRAMS/FUNCTIONS/ACTIVITIES ->	(a)	(b)	(c)	TOTAL
(As of date) a Total program outlays to date	$ 0	$	$	$ 1,766,488
b Less: Cumulative program income				
c. Net program outlays (line a minus line b)	0			1,766,488
d Estimated net cash outlays for advance period				0
e Total (Sum of lines c & d)	0			1,766,488
f Non-Federal share of amount on line e				
g Federal share of amount on line e	0			1,766,488
h. Federal payments previously requested				1,718,561
i Federal share now requested (Line g minus line h)				47,927
j Advances required by month 1st month when requested by Federal grantor agency for use in making prescheduled advances 2nd month 3rd month				

12 ALTERNATE COMPUTATION FOR ADVANCES ONLY

a. Estimated Federal cash outlays that will be made during period covered by the advance	$ 0
b Less: Estimated balance of Federal cash on hand as of beginning of advance period	
c. Amount requested (Line a minus line b)	$ 0

13 CERTIFICATION

I certify that to the best of my knowledge and belief the data above are correct and that all outlays were made in accordance with the grant conditions or other agreement ant that payment is due and has not been previously requested	SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	DATE REQUEST SUBMITTED
		February 28, 2000
	TYPED OR PRINTED NAME AND TITLE JOE WALKER - HEAD OF FINANCE	TELEPHONE (AREA CODE, NUMBER, EXTENSION) (+44) 020 7378 4822

This space for agency use

FEDERAL CASH TRANSACTIONS REPORT

(see instructions on the back. If report is for more than one grant or assistance agreement, attach completed Standard Form 272-A)

Approved by Office of Management and Budget

1. Federal sponsoring agency and organizational element to which this report is submitted: **USAID / OFDA**

2. RECIPIENT ORGANIZATION

Name: MERLIN (Medical Emergency Relief International)

Number and Street: 5-13 Trinity Street, Borough

City, State, and ZIP code: LONDON SE1 1DB, UNITED KINGDOM

3. FEDERAL EMPLOYER IDENTIFICATION NO

4. Federal grant or other identification number: **AOT-G-00-99-00219-00**

5. Recipient's account number or identifying number: **SN23/6**

6. Letter of credit number

7. Last payment voucher number

Give total number for this period

8. Payment vouchers credited to your account

9. Treasury checks received (wether or not deposited)

10. PERIOD COVERED BY THIS REPORT

FROM (month, day, year): **October 1, 2000**

TO (month, day, year): **December 1, 2000**

11. STATUS OF FEDERAL CASH (See specific instructions on the back)		
	a. Cash on hand beginning of reporting period	0
	b. Letter of credit withdrawals	0
	c. Treasury check payments	0
	d. Total receipts (Sum of lines b and c)	0
	e. Total cash available (Sum of lines a and d)	0
	f. Gross disbursements	47,927
	g. Federal share of program income	0
	h. Net disbursements (Line f minus line g)	47,927
	i. Adjustments of prior periods	
	j. Cash on hand end of period	-47,927
12. THE AMOUNT SHOWN ON LINE 11j ABOVE, REPRESENTS CASH REQUIREMENTS FOR THE ENSUING Days	13. OTHER INFORMATION	
	a. Interest income	
	b. Advances to subgrantees or subcontractors	

14. REMARKS (Attach additional sheets of plain paper, if more space is required)

15. CERTIFICATION

I certify to the best of my knowledge and belief that this report is true in all respects and that all disbursements have been made for the purpose and conditions of the grant or agreement

AUTHORIZED CERTIFYING OFFICIAL

SIGNATURE

DATE REPORT SUBMITTED: **February 28, 2001**

TYPED OR PRINTED NAME AND TITLE: **JOE WALKER - HEAD OF FINANCE**

(Area Code) (Number) (Extension): **(+44) 020 7378 4822**

THIS SPACE FOR AGENCY USE