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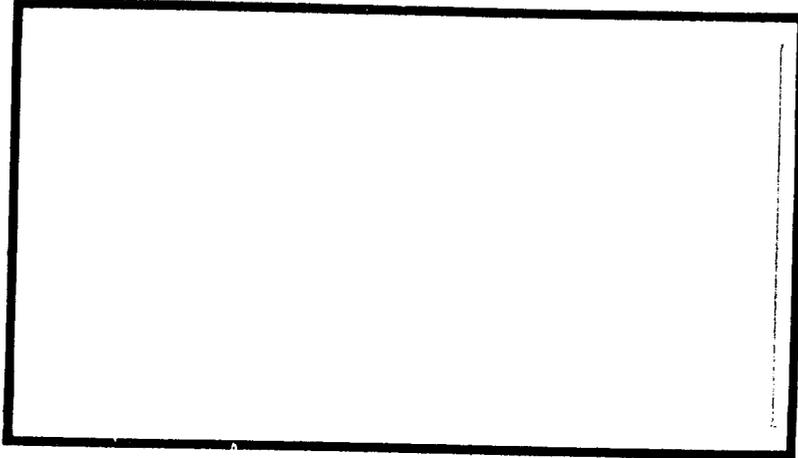
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AMERICAN PUBLIC HEALTH ASSOCIATION
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1015 Eighteenth Street, N.W.
Washington, D.C. 20036

The Sahel Epidemiological and
Environmental Assessments Project

Section I Part H
VOLUME THREE

Research on Onchocerciasis
at Imeloko,
Republic of Zaire

Research on Onchocerciasis

Imeloko, Equateur

Republic of Zaire

Studies and Report by:

Armed Forces Institute of Pathology
Team:

Daniel H. Connor, M.D., Team Leader
Wayne M. Meyers, M.D., Ph.D.
Ronald C. Neafie, M.S.
John F. Duncan, H.M.C., U.S.N.

During the Period:

March 4 - March 26, 1977

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Authorized Under Contract No. AID/Afr-C-1253
SAHEL EPIDEMIOLOGICAL AND ENVIRONMENTAL ASSESSMENT PROJECT

June 1, 1977

R E S E A R C H O N O N C H O C E R C I A S I S

at

IMELOKO, REPUBLIC OF ZAIRE

4 - 26 March 1977

Prepared by Research Team,
Department of Infectious and
Parasitic Disease Pathology,

ARMED FORCES INSTITUTE OF PATHOLOGY
Washington, D.C.

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SUMMARY

This report describes activities of a research team which studied onchocerciasis in the Republic of Zaire during March 1977. The team was supported in the field by the Medical Director and staff of IMELOKO (Institut Médical Evangélique - LOKO), the hospital run by the Paul Carlson Medical Program (PCMP). Financial and material support was contributed by the U.S. Agency for International Development (US-AID), by Gulf Oil Corporation, and by the World Health Organization. The team's main thrust was to evaluate onchocerciasis and other filarial infections in the population around IMELOKO. Demographic, clinical, and epidemiological data were all collected and are being correlated with blood smears and biopsy specimens of skin, onchocercal nodules, and lymph nodes. The main purpose was to establish base-line data as an introduction to treatment and control. Finally, long-range therapy was begun on the most severely afflicted patients and a procedure for follow-up evaluation was established.

PERSONNEL

The research team was comprised of four members of the Department of Infectious and Parasitic Disease Pathology, Armed Forces Institute of Pathology, Washington, D.C.

Daniel H. Connor, M.D., Chairman

Wayne M. Meyers, M.D., Ph.D.,
Chief, Microbiology Division

Ronald C. Neafie, M.S.,
Diagnostic Parasitologist

John F. Duncan, HMC, USN, Technician, and NCOIC
(Noncommissioned Officer in Charge)

Collaborators and contributors at IMELOKO who offered scientific, maintenance, logistical, and other support:

Arden Almquist, M.D., Medical Director, IMELOKO

Jo Ann Almquist, Administrative Assistant, IMELOKO

Diomi Mawesa, M.D., Director, Integrated Medical Care, Gbado-Lite
Zea, Laboratory Assistant, IMELOKO

Ganakomba, R.N., Hospital Administrator, IMELOKO

Jody LeVahn, R.N., Nurse, Anesthetist, Pharmacist, IMELOKO

Roger Johnson, M.D., General Surgeon, IMELOKO

Mary Kosky, R.N., Medical Assistant, IMELOKO

Dave Pihl, Maintenance, IMELOKO

Jim Alexander, Peace Corps - Animal Husbandry, IMELOKO

Carroll Anderson, Medical Assistant, IMELOKO

Paul Noren, Interpreter, Medical Assistant, IMELOKO

Gobo, R. N., Surgical Assistant, IMELOKO

Gonsali, Surgical Assistant, IMELOKO

Leo Lanoie, M.D., Physician, Karawa

Teddy Johnson, M.D., Physician, Bokada

INTRODUCTION AND RESEARCH OBJECTIVES

Although onchocerciasis has been known for over 100 years (discovered in 1875 by Surgeon John O'Neil), the disease has been regarded as rare and inconsequential by most American physicians. Before World War II few American physicians had heard of onchocerciasis and even today, probably no more than six American physicians have done field research on onchocerciasis. Since World War II, however, there has been a gradually increasing awareness of the severity and extent of onchocerciasis and today onchocerciasis is recognized as one of the world's major public health problems. An estimated 40 million Africans are infected and of these approximately 500,000 are blinded or have severely compromised vision. In addition to personal hardship, onchocerciasis prevents utilization of some of Africa's most fertile valleys, thus hindering economic advance. During the past five years, a number of agencies and organizations, including the International Bank for Reconstruction and Development, the World Health Organization, the Pan American Health Organization, and U.S. Air for International Development have taken steps to promote research on the control and prevention of onchocerciasis. Detailed knowledge on the pathology and pathogenesis of onchocerciasis is lacking and thus to gain a better understanding of these aspects, we undertook this study.

Onchocerciasis continues to be a severe problem at IMELOKO, Zaire, afflicting virtually all indigenous adult Africans in that geographical area. No research has been done on onchocerciasis at IMELOKO since our studies in 1968. That year we established that onchocerciasis was a severe disease there and, further, that Onchocerca volvulus microfilariae cause severe lymphadenitis. Unproven, however, is whether O. volvulus alone causes epephantiasis. Since 1968, Dr. Arden Almquist has developed at IMELOKO a modern hospital with an average daily census of 170 patients. In this environment we collected specimens, data, photographs and performed an autopsy, and established a basis for an ongoing program of research in onchocerciasis and other filarial diseases.

Our objectives were as follows:

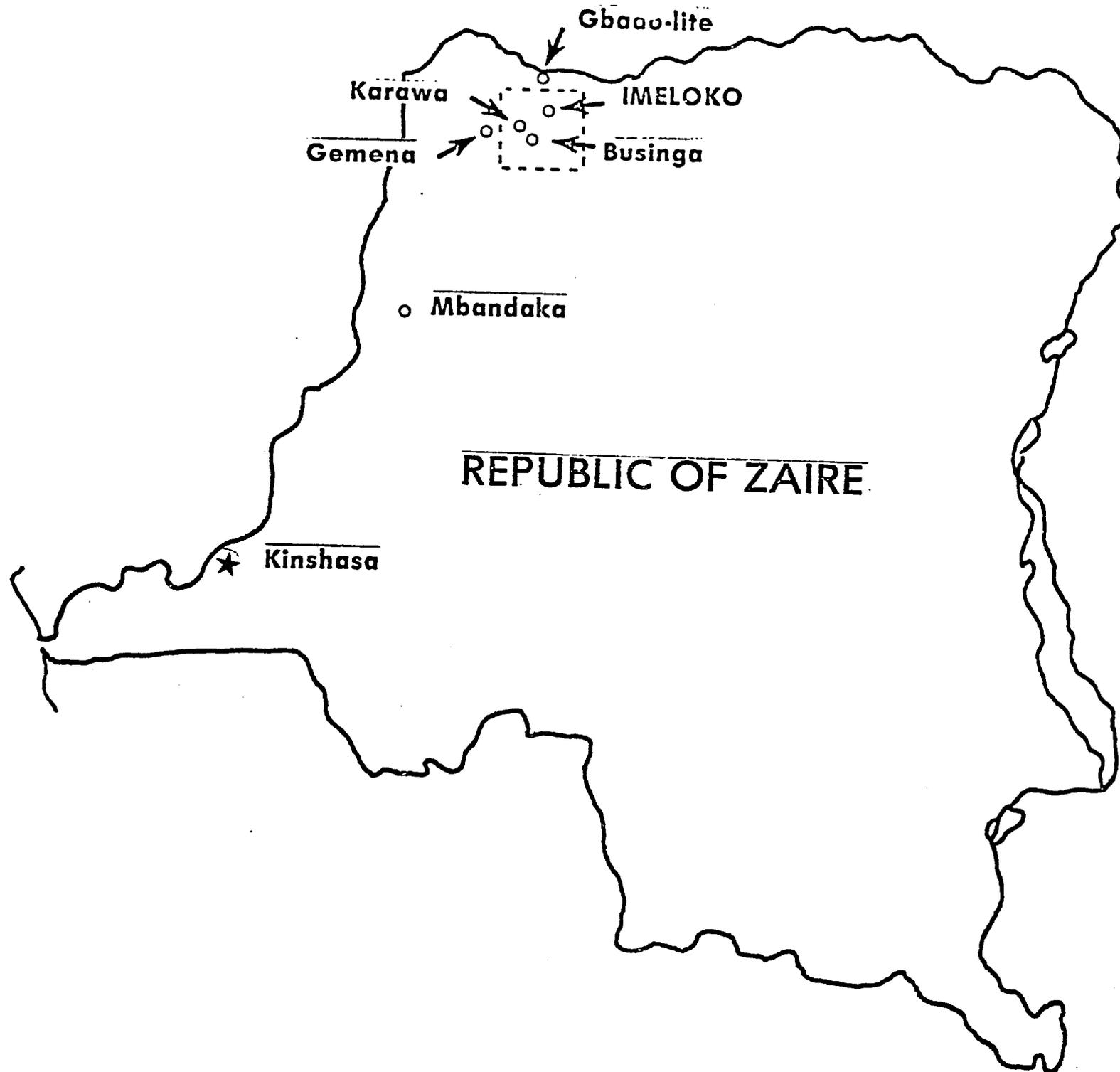
A. General

To determine how and why O. volvulus damages man and how other filarial infections (loiasis, dipetalonemiasis and perhaps others) may modulate onchocerciasis.

B. Specific

1. determine which filariae infect residents in the IMELOKO region of Zaire, and the prevalence of each of these filaria;
2. determine the prevalence, the cause, and the mechanisms of elephantiasis, hanging groin, and other regional lymphedemas in inhabitants of Mbwasenge and LOKO;
3. determine whether long-range therapy with diethylcarbamazine (DEC) will reduce regional lymphedemas and elephantiasis;

4. determine whether abdominal lymph nodes are involved in onchocerciasis;
5. determine the concentration of microfilariae in different regions of the skin and determine especially whether those with elephantiasis have higher concentrations in the pelvic region; and
6. determine whether the patients in the IMELOKO region have microfilariae in sputum, urine, blood, and spinal fluid, before and after treatment with diethylcarbamazine.



Gbaoo-lite

Karawa

IMELOKO

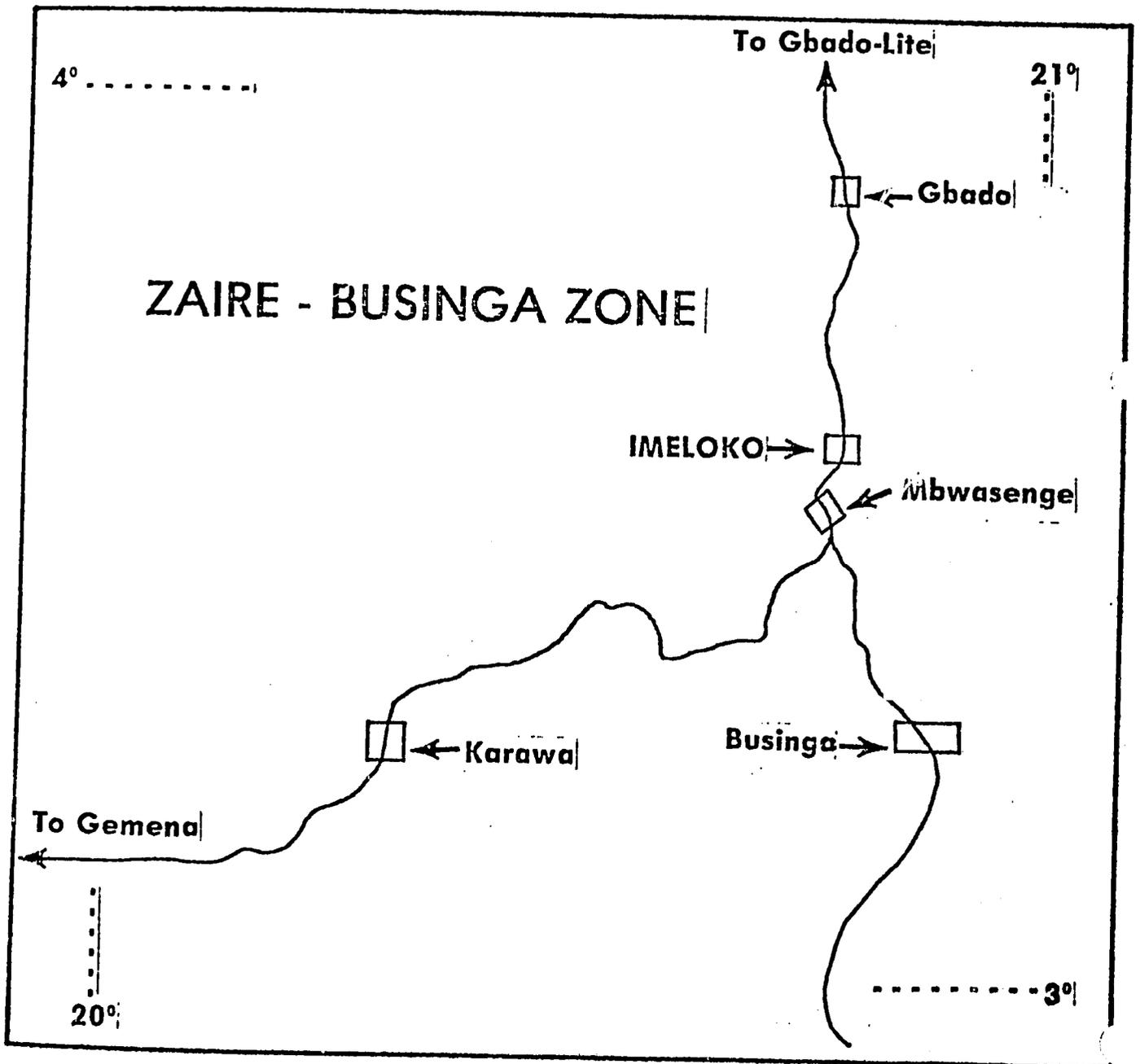
Gemena

Businga

Mbandaka

REPUBLIC OF ZAIRE

Kinshasa



ACCOMPLISHMENTS

From Friday, 4 March 1977, 1500 hours, until Saturday, 26 March 1977, at 1130 hours, the team worked at IMELOKO in the Ubangi area of Zaire. We collected a variety of specimens from approximately 1,000 patients. These have been accessioned to the Registry of Geographic Pathology at the Armed Forces Institute of Pathology (accession numbers 1607000 to 160800 and 1610031 to 1610041). Clinical data, parasitological data, pathological specimens, and detailed clinical photographs are now being catalogued and correlated. Complex and nonobvious correlations will be hastened by CLIPSTARS, a modern high-speed computer at the AFIP, specially designed and programmed for clinicopathological correlations. Our studies include light, electron, and fluorescent microscopy in addition to standard clinical and pathological analyses. Our formal presentations will require ten to twenty months of work by various members of the Department, but we can offer the following preliminary findings:

A. Smears were collected from 1,000 patients. These were thick and thin films, Knott's concentrations, and preparations by millipore filter techniques. Blood for these were drawn during the forenoon, afternoon, and between 2130 and 2330 hours at night. Circulating microfilariae identified were Loa loa, Dipetalonema perstans, and Wuchereria bancrofti. Prevalence and concentrations of each species will be determined and reported in detail later.

B. Clinical data - The data on the 1,000 subjects include the prevalence and distribution of onchocercal nodules, evaluation of vision, degree, type, and distribution of dermatitis, presence of lymphadenopathy, hanging groin, hanging scrotum, hydrocele, and elephantiasis.

C. Skin snips - These were done to reveal the presence and concentration of microfilariae in the skin - taken routinely from the hip and serially from shoulder, hip and knee from patients specially studied and from those selected for treatment.

D. Lymph nodes - Specimens of femoral or inguinal lymph nodes were taken from 50 patients. The gross and microscopic changes in these nodes will be correlated with the clinical severity and distribution of onchocercal edema, elephantiasis, and dermatitis. The few nodes studied so far reveal characteristic changes of onchocercal lymphadenitis. These are fibrosis of the capsule, sinus histiocytosis, follicular atrophy, dilatation of sinusoids, and perivascular fibrosis.

E. Photographs - Approximately 1,000 photographs depicting overall and clinical changes were taken. Both color and monochrome were taken on bellows, large format (2-1/4" X 2-3/4") cameras. These will document, better than words, the unusual and extreme effects of onchocerciasis among these people.

F. Autopsies - We performed the first medical autopsy at IMELOKO. The subject was a 60-year-old female and died of a staphylococcal pyemia. The cause of death was a severe staphylococcal pericarditis and staphylococcal abscesses of the liver. This woman lived in the village of Mbwasenge, where our research was concentrated. She also had advanced changes of onchocerciasis.

In addition to this autopsy, Dr. Leo Lanoie of the Karawa Mission Hospital, performed three autopsies and contributed these to our collection. These also revealed unusual features of exotic and parasitic diseases.

G. Therapy - Eighteen patients with elephantoid changes were begun on a long-range therapeutic regime. This regime included DEC, 50 mgm/week, aspirin, and antihistamines, as necessary to control pruritus and pain.

H. Village of Mbwasenge - This village is located ten kms from IMELOKO, along the Businga road. Of 425 villagers studied, 305 were infected. Thus overall, 71.76% were infected. Uninfected villagers, however, tended to be the infants and children. After age 20, virtually every villager had overt manifestations of onchocerciasis. See attached data sheet and graph.

I. Town of Businga - Businga is located 40 kms from IMELOKO and is the shipping terminus on the Mongala River. 201 subjects were examined for eye changes, dermatitis, regional edemas, nodules, lymphadenopathy, and for microfilariae in the skin. This material is now being studied.

J. IMELOKO - The indigenous population living in and around the hospital were examined for signs, symptoms, and laboratory features of onchocerciasis and other filarial infections. This material is now being studied.

K. GBADO - The expatriate population of Gbado, 40 kms from IMELOKO, was examined for evidence of filariasis. Brief histories, skin snips, and blood smears were taken from seventeen subjects.

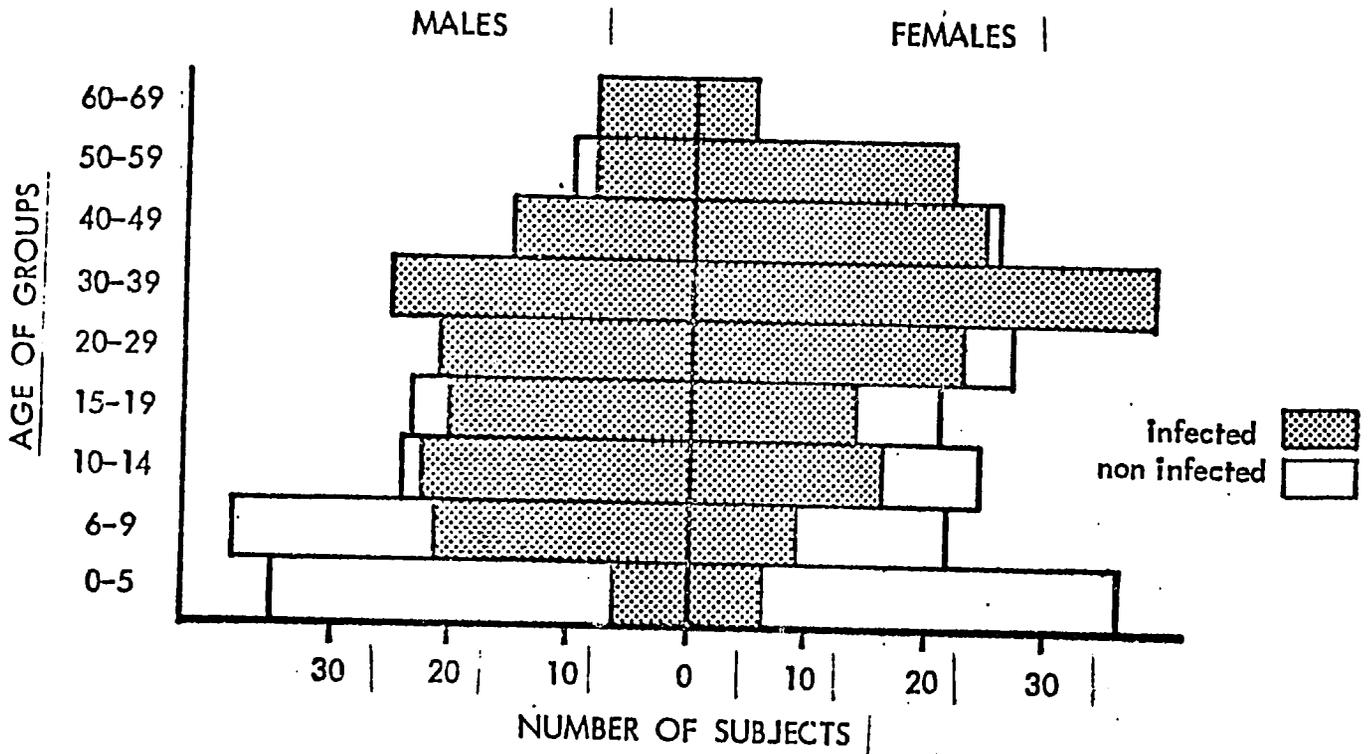
VILLAGE OF MBWASENGE - AGE DISTRIBUTION OF ONCHOCERCIASIS

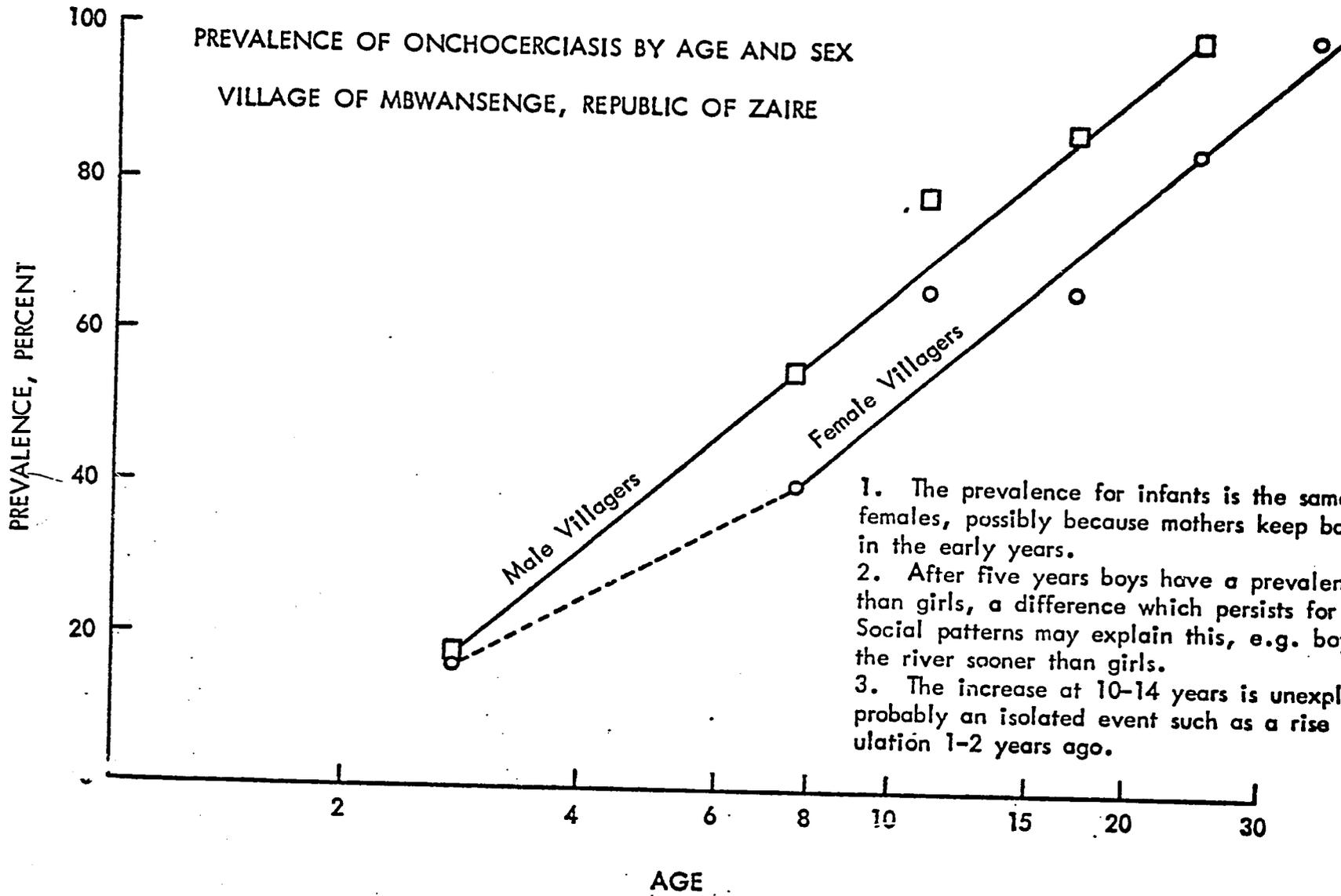
Age (yrs)	+	-	Total	Male	Female	Total	% Male	% Female	% Total
0-5	+			6	6	12	17.1%	16.7%	16.9%
	-			29	30	59	82.9%	83.3%	83.1%
	T			35	36	71			
6-9	+			21	9	30	55.3%	40.9%	50.0%
	-			17	13	30	44.7%	59.1%	50.0%
	T			38	22	60			
10-14	+			22	16	38	78.6%	66.7%	73.1%
	-			6	8	14	21.4%	33.3%	26.9%
	T			28	24	52			
15-19	+			20	14	34	87.0%	66.7%	77.3%
	-			3	7	10	13.0%	33.3%	22.7%
	T			23	21	44			
20-29	+			21	23	44	100%	85.2%	91.7%
	-			0	4	4	0	14.8%	8.8%
	T			21	27	48			
30-39	+			25	39	64	100%	100%	100%
	-			0	0	0	0	0	0
	T			25	39	64			
40-49	+			15	25	40	100%	96.2%	97.6%
	-			0	1	1	0	3.8%	2.4%
	T			15	26	41			
50-59	+			8	22	30	80%	100%	93.8%
	-			2	0	2	20%	0	6.2%
	T			10	22	32			
60-69	+			8	5	13	100%	100%	100%
	-			0	0	0	0	0	0
	T			8	5	13			
Total	+			146	159	305	71.9%	71.6%	71.8%
	-			57	63	120	28.1%	28.4%	28.2%
	T			203	222	425			

ONCHOCERCIASIS

MBAWSENSE VILLAGE, REPUBLIC OF ZAIRE

(PREVALANCE BY AGE AND SEX, DETERMINED BY PALPABLE NODULES, SKIN SNIPS AND MAZZOTTI REACTIONS)





1. The prevalence for infants is the same for males and females, possibly because mothers keep babies near them in the early years.
2. After five years boys have a prevalence 15% higher than girls, a difference which persists for older ages. Social patterns may explain this, e.g. boys may frequent the river sooner than girls.
3. The increase at 10-14 years is unexplained but is probably an isolated event such as a rise of vector population 1-2 years ago.

CASES ACCESSIONED AT AFIP

All subjects studied are accessioned into The Registry of Geographic Pathology at the Armed Forces Institute of Pathology.

The AFIP accession numbers are as follows:

1607001 - 1607239	IMELOKO villagers
1607240 - 1607440	Businga villagers
1607441 - 1607857	Mbwasenge villagers
1607858	Autopsy - 60-year female, Mbwasenge Village
	a) onchocerciasis, skin and lymph nodes
	b) amebiasis, cecum, with superimposed staphylococcal infection
	c) staphylococcal pericarditis
	d) staphylococcal abscesses, liver and kidney
1607859 - 1607863	patients with elephantiasis (night bloods taken)
1607864 - 1607946	Mbwasenge villagers (night bloods taken)
1607947 - 1608000	miscellaneous cases - surgical biopsies,
1610031 - 1610041	autopsies and blood smears
and	
1607000	

DISEASES IDENTIFIED IN THE IMELOKO AREA

Parasitic

1. onchocerciasis - one of the most prevalent diseases in the area
2. dipetalonemiasis (perstans) - common but with severe clinical manifestations
3. loiasis - common with symptoms following treatment with DEC
4. bancroftian filariasis - rare microfilariae found in blood, no obvious clinical features but the relationship to elephantiasis awaits study
5. streptocerciasis - prevails in that general area of Africa
6. amebiasis - common and with severe and sometimes fatal complications
7. tungiasis - common
8. pentastomiasis - prevalence unknown but has been identified throughout Tropical Africa
9. scabies - common and severe
10. malaria - common and frequently fatal - a special problem during pregnancy
11. ascariasis - common
12. trichuriasis - common
13. ancylostomiasis - common
14. trypanosomiasis - suspected in a woman with painless enlargement of lymph nodes in the posterior cervical triangle

Bacterial and Fungal

1. tropical phagedenic ulcer - common and severe - afflicts expatriate and indigenous people
2. tuberculosis - common and severe, a common cause of death among young adults
3. staphylococcal pyemia
4. gonorrhoea - common and with chronic complications, especially urethral stricture
5. pneumococcal pneumonia
6. syphilis - common
7. leprosy - common - no regular or organized service, hence many complications and many with advanced lesions
8. gas gangrene - fatal infection in an adult man following penetrating trauma to leg
9. dermatophytosis - very common
10. phaeomycotic cyst - not common

Viral

1. rabies - in a dog brain - contributed by Dr. Lanoie
2. venereal warts
3. measles
4. chicken pox

Other

1. endemic goiter - common and severe
2. cretenism - common
3. lymphostatic verrucosa
4. kwashiorkor
5. ainhum
6. Burkitt lymphoma
7. Kaposi's sarcoma

BUDGET

USAID/APHA (not to exceed \$11,500.00)

International travel (4 team members @ \$1079 each)		\$ 4,316.00
Excess baggage		2,444.39
Per diem	Meyers	\$ 1,022.25
	Neufie	1,022.25
	Duncan	1,010.75
	Connor	989.75
		<u>\$ 4,045.00</u>
		4,045.00
		<hr/>
		\$ 10,805.39

GULF OIL CORPORATION (Grant of \$5,500.00)

Incountry travel

a) Kinshasa to Gemena (\$206.30 X 4 team members) ¹	\$ 825.00
b) IMELOKO to Kinshasa (U.S. Embassy airplane) ²	1,705.00
c) Overland - approximately 1,000 Kms @ 70¢ Km (see attached estimate)	700.00
d) Patient care (300 patient days at \$2/day)	600.00
e) Compensation for ZEA (Laboratory Research Assistant) ³	75.00
f) Lodging, Kinshasa, for Dr. Almquist ⁴	42.50
	<hr/>
	\$ 3,947.50

WORLD HEALTH ORGANIZATION

Four specimen kits @ \$50.00 each ⁵	\$ 200.00
	<hr/>
	\$ 200.00
	<hr/> <hr/>
TOTAL	\$ 14,952.00

1 - 5, Notes of explanation follow.

BUDGET NOTES

1. This is the cost of the round trip to Kinshasa-Gemena. Only the Kinshasa-Gemena portion of the ticket was used because all internal flights by Air Zaire ceased while we were at IMELOKO. Air Zaire would not refund the unused portion. Each team member was reimbursed in full by the PCMP. We hope the unused portion can be used.

2. Colonel Powers flew the team in the U.S. Embassy airplane. Colonel Powers calculated the cost at \$341 per hour for five hours = \$1705. This was paid to a special funding cite, DA, U.S. Embassy, Kinshasa, by the PCMP.

3. This item - a portable radio - was negotiated and agreed by Dr. Almquist and the team members on 25 March 1977. ZEA, the laboratory worker at IMELOKO, donated his full time and energies to the team research. The radio was a token of our appreciation. Compensation is to be directly to Dr. Wayne H. Meyers from the PCMP (\$75.00).

4. Dr. Almquist made a special trip from Mbandaka to Kinshasa, on 26 February 1977, to meet the team and assist in their travel to the interior. Dr. Almquist paid for his own air travel, but Dr. Meyers paid for his accommodations, 26 February to 2 March. Dr. Meyers is to be compensated \$42.00 for this expense.

5. These kits, supplied by the World Health Organization, under WHO/AFIP Contract U809, were used to collect and ship specimens. Two kits were left at Karawa and at IMELOKO to assist in the continuing collection of specimens from subjects with onchocerciasis.

OVERLAND TRAVEL BY
ONCHOCERCIASIS RESEARCH TEAM,
IMELOKO, MARCH 1977

3 March 1977	Gemena to Karawa, entire team, Toyoto truck	100 Kilometers
4 March 1977	Karawa to Loko, entire team, Toyoto truck	70
5 March 1977	Loko to Businga and return - Drs. Almquist and Connor	80
6 March 1977	Loko to Gbado-Lite and return, entire team, Toyoto truck	200
8 March 1977	Loko to Mbwasenge and return, 4 trips	80
10 March 1977	Loko to Mbwasenge and return, 3 trips	60
12 March 1977	Loko to Mbwasenge and return, 2 trips	40
15 March 1977	Loko to Businga and return	80
16 March 1977	Loko to Businga and return	80
17 March 1977	Loko to Businga and return	80
18 March 1977	Loko to Mbwasenge and return	20
22 March 1977	Night trip, Loko to Mbwasenge and return	20
23 March 1977	Loko to Mbwasenge and return	20
3-		
23 March 1977	Miscellaneous travel in and around IMELOKO	70
	TOTAL	1,000 Kilometers

INELCKO, B.P. 140, Gemena
Republic of Zaire, Africa
Dec. 9, 1976

Daniel H. Connor, M.D.
Chairman, Dept. of Infect. and Parasitic Dis., Pathology
Armed Forces Institute of Pathology
Washington, D.C., E.U.A.

Dear Dr. Connor,

I am writing to invite you to bring a research team once again to the Loko hospital in northern Zaire to renew your study of filiarisis, and, more particularly onchocerciasis. It is over 8 years since you were here and nothing has been done about filaria in this area since. Infestation has got to be one of the heaviest in the world. It is a problem not only for the general population, but for staff-
indigenous and expatriate--as well.

We are far better prepared to assist you now than in 1968. Our 140 bed hospital has a wide and excellent reputation, and as a consequence runs a daily census of about 120 patients--10 to 15% of whom suffer from filiarisis and are hospitalized for hetrozan cures or surgery. I could set aside 15 beds, possibly 20, for your use, and offer you up to 100 m² floor space for offices, clinics, and laboratory. Facilities for autopsy are available not only at Loko but also at Businga, and Karawa as well. We have a much larger staff than before, with improved skills, and could count the large and skilled staff at Karawa among our resources. We have a 24-hour supply of clean water, two 35 KW generators which operate on an intermittent basis as well as a new 3 KW stand-by generator which we would put at your disposal for the duration of your work. We have 4-wheel drive vehicles for getting around, and the services of the Mission Aviation Fellowship plane, a Cessna 185 based at Karawa, 18 minutes away. Our airstrip is 800 m., gravel surfaced, thrice-daily radio contact is maintained with MAF, and extra contacts as required.

You would be well-advised, however, to assure yourselves, if possible, of a separate supply of fuel, which is currently in short supply.

Housing for up to 6 guests is available, with dining, laundry, and such services as are necessary to your stay, too. You would, in fact be quite comfortable. There is a large pond in which to swim, fish, and go boating, if desired. I even have a pool table. Roger Johnson has a fine horse, and though there's no tennis, there's ping pong, volley ball, and soccer, plus endless roads on our 5600 acre ranch where you can run or bike.

In short, how about a return engagement? My wife repeatedly tells me: "Arden, you have got to do something about filaria before we ever leave this place!" It is, indeed a serious problem, and together we could make a real contribution to the understanding of this little understood disease, or more exactly, group of diseases.

This time we could assure adequate follow-up. We have the staff and facilities and will to do it. It's in our self-interest, and in the interest of the millions of people affected, as well as in your interest as scientists with a special responsibility to Americans who go abroad.

Anything in '77 is OK but it's easier to get around in late February and March at the end of the dry season.

Sincerely,

Arden Almqvist

Arden Almqvist, M.D.
Medical Director

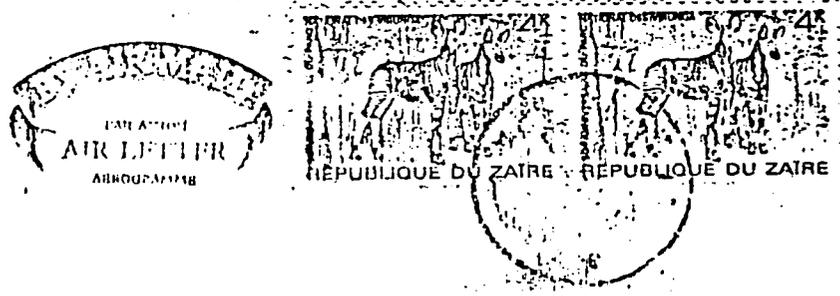
Sender's name and address: *A. Almqvist*
IMELOKO
B.P. 140 Coema
Rep. du Zaïre

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Dr. Daniel H. Connor
Dept. of Inf. & Par. Dis. Pathology
Armed Forces Inst. of Pathology

Washington, D.C. 20305
E.U.A.

Memorandum

John Eason
APHA

DATE: February 16, 1977

AFR/DR/IN: Marie Kirby *mk*

Support of AFIP Team to Zaire

This memo is sent to you per phone instructions from Dr. Cross, AFR/DR/IN 2/15/77 re: the negotiations which have taken place between Dr. Conner, AFIP; John Eason, APHA, and Dr. Cross.

As a result of these negotiations we have agreed to supply the AFIP team with round trip transportation from Washington to the Ubangi Area of Zaire via Kinshasa back to Washington for four team members. We have also agreed to furnish per diem for the team members for 31 days.

This project will be supported under the existing AID Contract with APHA for Environmental Health Assessments Projects and is not to exceed the amount of \$11,500. We request APHA to purchase the necessary tickets and arrange the itinerary and per diem.

The team will conduct diagnostic and prevalent studies of onchocerciasis in the Ubangi Area of Zaire. The team will go directly to Kinshasa to confer with Dr. John Kennedy, USAID Mission, and Dr. Nguete Kikkela, Minister of Health, G.O.Z. prior to proceeding to the Ubangi Area.

At the end of the studies the AFIP team will submit a full report to APHA and AID/Washington.



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

UNFORESEEN PROBLEMS

1. Travel to the Interior

On reaching Kinshasa we had no definite plans for travel to IMELOKO. Flights by Air Zaire were irregular, always oversold, and curtailed by the lack of fuel at Mbandaka.

2. Travel from the Interior

While at IMELOKO, political unrest in Shaba led to the cancellation of all upcountry flights by Air Zaire, thus stranding the team temporarily.

3. Preservation of Biological and Photosensitive materials

On several occasions during the seven days in transit to IMELOKO, the excess luggage was deposited in closed vehicles, covered trucks, or stacked at airports in the direct rays of the equatorial sun. This oven-effect, had it been prolonged, would have destroyed some of our biologicals and all of the film. Constant supervision of the excess baggage prevented disastrous losses.

4. Overland Transportation at IMELOKO

The worldwide fuel shortage is severe in the Republic of Zaire and especially in the interior. One barrel of gasoline, contributed by Dr. Diomi, enabled us to run our generator and make several additional journeys beyond the IMELOKO establishment.

TEAM ITINERARY/LOG

Friday 25 February 1977

Depart Washington DC

Saturday 26 February 1977

1730 Arrive Kinshasa, met by Embassy Staff

2000 Meet Dr. Arden Almquist, discuss plans and options for travel to interior

2100 Dinner with Edna Staple and Phyllis Gilbert

Sunday 27 February 1977

1000 Brief Lt. Colonel David Beach, DAO, on mission and discuss options for travel to interior

1200 Brief Dr. Leo Falk, US Embassy physician, on research objectives and options for travel to interior. Store excess baggage in embassy store room.

1300 Lunch (Duncan and Connor) with Dr. Falk

1700 Meet Mr. Stuart Methvin, US Embassy staff, and discuss plans for travel to interior

1730 Cocktails (Duncan and Connor) with Mr. and Mrs. Methvin

2200 Met with Mr. A.A. Iderman, Director of Commercial Services, Air Zaire, Discuss options for travel to interior

Monday 28 February 1977

1000 Brief US Ambassador Walter Cutler on research objectives and options for travel to interior

1300 Lunch with Dr. Cris Voth, Canadian Inter^{est}ist at Mama Yemo Hospital

1400 Purchase tickets Air Zaire, Kinshasa-Gemena & return, and purchase voucher for excess baggage

Tuesday 1 March 1977

0900 Brief Dr. John Kennedy, Chief of USAID medical mission in Zaire

1000 Meet Dr. Nsita, Minister of Health, ROZ

1500 Meet Dr. Mawesa Diomi, Medical Assistant to President Mobutu

2100 Loaded embassy vehicle (Neafie & Connor) with team equipment

Wednesday 2 March 1977

0750 Depart Kinshasa (Air Zaire)

0930 Arrive Mbandaka

Thursday 3 March 1977

1100 Depart Mbandaka (Air Zaire)

1230 Arrive Gemena

1400 Depart Gemena (overland)

1730 Arrive Karawa

1830 Dinner with Dr. Roger and Eileen Thorpe

Friday 4 March 1977

0800 Rounds at Karawa General Hospital

1015 Depart Karawa (overland)

1300 Arrive IMELOKO

1400 Unpack and set up laboratory

Saturday 5 March 1977

0840 Depart IMELOKO for Businga (Connor, Almquist & Ganakomba) to report to the Zone Chief

1830 Dinner with Mr. & Mrs. Ganakomba. Discussed mission and research objectives

Sunday 6 March 1977

0845 Depart IMELOKO for all-day round trip Gbado-lite

1130 Arrived Gbado-lite. Met with Drs. Diomi and Ilanga. Discussed integrated medical care for Gbado-lite and surrounding territory

1845 Arrive IMELOKO

Monday 7 March 1977

0730 Began survey of Loko village including clinical examination, skin snips, thick and thin smears, photographs of significant lesions.

175 subjects examined.

Tuesday 8 March 1977

0730-2000 Began survey of Mbwasenge villagers

Wednesday 9 March 1977

0730-2000 Research survey of Mbwasenge and Loko villagers

Thursday 10 March 1977

0800 Survey work in Mbwasenge. First autopsy on Mbwasenge villager

1300 Collect data and meet with Dr. Leo Lanoie from Karawa

Friday 11 March 1977

0800-1800 Survey at Loko and Mwasenge and consultations with Dr. Lanoie
Saturday 12 March 1977

0800-1600 Continue work in village of Mwasenge and select patients with
elephantiasis for long term therapy

2200 Begin collecting night bloods (Neafie and Duncan)

Sunday 13 March 1977

Tour of IMELOKO

Monday 14 March 1977

0800-1430 At Mwasenge, study 150 subjects

1500-1800 At IMELOKO collect data, smears, snips and take clinical photos

Tuesday 15 March 1977

0900 To Mwasenge to evaluate treatment with diethylcarbamazine

1400 Work at IMELOKO and lab

Wednesday 16 March 1977

0900 Arrive Businga, cross bridge, and identify survey site

1000 Begin survey 201 subjects. To Businga hospital (Almquist and Connor)
to visit Dr. VanDewee and consult on patients with elephantiasis

1600 Depart for IMELOKO

1745 Arrived IMELOKO

Thursday 17 March 1977

0900 Continue survey at IMELOKO (Meyers & LeVahn to Businga) - visit Rick
& Sue Johnson

2000 Six patients to IMELOKO

Friday 18 March 1977

0800 Continued survey at IMELOKO. Night bloods (Neafie & Duncan) continue
Begin detailed studies of patients with elephantiasis including
biopsy specimens, measurements, photographs, nodules, Knott's concen-
trations and millipore filter techniques

1000 To Mwasenge (Meyers and Connor) to dispense DEC

Saturday 19 March 1977

0900 Photographed Tunga penetrans (Almquist). Continue study of those with
elephantiasis

0900 Consultations at IMELOKO, polaroids taken of patients - continue
study of patients with elephantiasis

1300 To Gbado (Almquists, Neafie and Connor) to survey expatriate population
for filarial infections (16 subjects studied by snips and thick and

thin smears). Tabulate data (Meyers & Duncan) on Mbwasege villagers for Drs. Diomi and Kiyombo

Sunday 20 March 1977

0915 Drs. Diomi and Kiyombo arrive IMELOKO (from Gbado-lite). Tour hospital, labs, dispensary and animal reserve

1415 Present slides (2x2's) and discussion on tropical diseases, current research objectives to IMELOKO staff and visitors

1600 Drs. Diomi and Kiyombo depart for Gbado-lite

Monday 21 March 1977

0900 Continue work in lab preparing, staining and coverslipping slides (Neafie and Duncan) continue examinations, biopsying photographing and consulting (Meyers & Connor)

1600 Collect and photograph a variety of flies (Johnson & Connor)

Tuesday 22 March 1977

0730-1800 Continue to biopsy, snip, photograph, and to collect blood and sera

2100 Collect thick smears (night) from 101 Mbwasege villagers (after movie of Rodeo and other entertainment)

Wednesday 23 March 1977

0800 Rounds on filarial ward IMELOKO and arrange for continued treatment

1300 Lightning during sudden electric storm ignited grass in front of residences

1300 Photograph local scenes at IMELOKO

1500-2330 Begin to catalogue and package specimens for return to US

Thursday 24 March 1977

0900 Prepare crates and specimens for travel - ward rounds, to Mbwasege for local photos

2200 Foot race and weigh total persons and baggage for departure - 1298 lbs

Friday 25 March 1977

0800 Continued rounds, formal coffee given by Jody LeVahn, revised packing crates

1230 Lunch with Mr. & Mrs. Zea

1400 Dr. Teddy Johnson and Dr. Leo Lanoie arrived IMELOKO - letter (brought specimens of 3 autopsies)

1430-1800 Continue to prepare and pack specimens for travel

Saturday 26 March 1977

0700 Continue final rounds and packing

1130 American Embassy plane arrives IMELOKO with Mr. & Mrs. Nelson and Mr. Bob Thornbloom as passengers, pilot Col. Elliott Powers, copilot Captain Jay Hilman

1202 Depart IMELOKO

1435 Arrive Kinshasa

1530 Arrive at US Embassy made contact with Lt Col David Beach

Sunday 27 March 1977

1700 Recreation and dinner with Lt. Col and Mrs. David Beach

Monday 28 March 1977

0800 Meet with Col Elliot Powers and Lt Col David Beach

0915 Meet with Mr. Richard Dotson, USAID

0930 Describe research accomplishment to Dr. John Kennedy, US Medical AID

1500 Meet with Dr. & Mrs. Jeanty, Mama Yemo Hospital (Meyers & Connor)

Discuss past and future collaboration between Department of Pathology, Mama Yemo Hospital and AFIP

2200 Depart Kinshasa (Meyers & Neafie) for US via Europe

Tuesday 29 March 1977

0900 Arrange air shipment of crates, cabled Director, AFIP

1100 Met with Dr. Leo Falk on research accomplishments. Dr. Falk described his recent visit to FOMULAC, a hospital near Bukavu

1400 Arrange and confirm further travel

Wednesday 30 March 1977

1100 Meet with Dr. Mawesa Diomi - discuss possible medical research at Gbado-Lite

1300 Lunch with Dr. Diomi (Connor & Duncan) at Hotel Intercontinental

1500 Depart Kinshasa (Duncan) for US via Europe

1900 Depart Kinshasa (Connor) for US via Nairobi and Paris

Thursday 31 March 1977

1500 Arrive DC (Neafie & Meyers)

1700 Arrive DC (Duncan)

Saturday 23 April 1977

1500 Arrive DC (Connor)