FIELD STUDY REPORT OF A POLIO EXPERT TRAINING COURSE IN LAO P.D.R.

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March 1995

Japan International Cooperation Agency (JICA)
Institute For International Cooperation (IFIC)

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PREFACE

The field study Polio Expert Training Course took place from 9th to 18th March, 1995 in Lao People's Democratic Republic. This field study followed the International Polio Expert Training Course held in Kumamoto in January to March, 1995 and two Japanese course graduates participated in the study.

As stated in the WHO briefing concerning the Polio Eradication Program, Japan is requested to provide human resources in this field. Therefore we planned to study Laos EPI activities and to consider possible technology or system transfer.

This field study was organized by the Institute for International Cooperation (IFIC) in cooperation with the government of Lao PDR.

We hope that this report will be useful for polio eradication experts in the future.

Training Secretariat of IFIC

PARTICIPANTS OF THE FIELD STUDY

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CONTENT

I. Schedule of Field Study in Lao P.D.R.

9 (Thu)	11:35	Arrival at Vientiane by TG-690
	14:00	Courtesy Call to Dr Suzuki, Chief Advisor of JICA PHC Project
	14:15	Courtesy Call to Ministry of Health (Dr Som Ock, Dr Khempet)
	15:00	Courtesy Call to National Institute of Hygiene and Epidemiology (NIHE) Director, Dr Sithat and Dr Somthana
	16:00	Courtesy Call to WHO and briefing by Dr Nesbit (Program Officer for EPI) "Polio Eradication in Laos, the Role of WHO"
10 (Fri)	8:30	Regular meeting of Epidemiology on Polio Eradication
	10:30	Courtesy Call to UNICEF, Briefing by Dr Maryabin (Program Officer for EPI) "UNICEF's Policy on EPI, the role of Polio Eradication and EPI plus"
	14:00	At NIHE, briefing by Dr Somthana (National EPI manager) "Health Services in Laos, the Progress of Polio Eradication" visit to EPI facilities, NIHE Central Vaccine Stock
	15:00	Briefing by Dr Sisavanh "System of Cold Chain" 15:30 Briefing by Dr Phenta "Sentinel Surveillance System and New National Surveillance System"
11 (Sat)	8:30	AFP investigation 60 days after onset at Vientiane District
	14:00	Study of Polio Cases in Laos by video
12 (Sun)	10:00	Departure from Vientiane to Bolikhamxay province by car
	12:30	Arrival at Paksane district of Bolikhamxay province
	14:00	Visit to Provincial Hygiene and Epidemiology Station, Inspection of Cold Chain Stay in Paksane
13 (Mon)	7:30	from Paksane to Pakkading district by car
	8:30	Visit to Pakkading district Hygiene and Epidemiology Station, Inspection of Cold Chain
	9:30	Visit to Pakkading district Hospital
	10:00	Active Case Search and Immunization Coverage Survey in Pakkading district, village Stay in Pakkading District Hospital
14 (Tue)	8:00	from Pakkading to Lak Sao district by car
	11:00	Visit Kham Keut district Health Office and district Hospital
	12:00	Arrival at Lak Sao district
	14:00	Visit to District Hygiene and Epidemiology Station

	14:30	Lak Sao District Hospital
		Stay in Lac Sao
15 (Wed)	8:00	Active Case Search and immunization coverage survey in Lac Sao district and Kham Keut district.
		Stay in Lac Sao
16 (Thu)	8:00	from Lak Sao to Paksane district
	14:00	Arrival at Paksane and visit to the provincial hospital
	17:00	Arrival at Vientiane
17 (Fri)	9:00	Regular meeting of Epidemiology on Polio Eradication
	10:00	Report preparation
18 (Sat)	12:35	Departure for Bangkok by TG-691

II. GENERAL INFORMATION

1) History

Lan Xang, the first Lao kingdom was founded in 1353 and had flourished for about 200 years. The kingdom was broken up by the Burmese in the late 16th century. Although the kingdom was revived under Souligna Vongsa around 1637, it was divided into three kingdoms, Luang Prabang, Vientiane, and Champassak. The Lao kingdoms had been involved in a series of alliances with the neighboring kingdoms of Lanna (Chiang Mai), Vietnam, and Ayudhya since 1713, but they were at various times under the occupation of the Siamese, Burmese and Vietnamese.

The French entered Laos in 1893 following the conquest of Vietnam and Cambodia. During the colonial period, the French administration were not supportive for the establishment of advanced educational system because it might lead to an anti-French movement. The French made use of Vietnamese to administer the country. The king of Luang Prabang declared the independence of Laos in April 1945. Nationalistic movements rose up against recolonization by the French after the end of WWII, which lead to the establishment of the Lao Issara in 1945 and Neo Lao Issara in 1950. Laos was involved in the strife between the French troops and Viet Minh in the early 1950s. Both troops withdrew from the country after the truce based on the Geneva agreement in May 1954.

During the Cold War, the confrontation between the Pathe Lao and the Royal Lao government had continued. The American Army continued bombing in the northern part of Laos from 1962 to 1968. It is said that over 10% of the total population were killed in this bombing. Following the end of the Vietnam War, the Congress of Peoples' Representatives accepted the abdication of the king and proclaimed the establishment of Lao PDR in December 1975.

The new nation was faced with serious difficulties. Western aid was withdrawn and the value of the currency depreciated rapidly. Some rightist guerrillas remained at large. Many trained government officials and commercial leaders, as well as ordinary farmers, fled to Thailand. The new Lao PDR Government assigned immediate priority to agricultural production, national security, and the consolidation of socio-political activities.

In 1986, the government launched an economic reform program, the New Economic Mechanism (NEM). The pace of Laos economic growth has been accelerating recently.

2) Geography

The Lao PDR is a land-locked country, bordered by China, Myanmar, Vietnam, Cambodia and Thailand. It covers an area of 236,800 km^2 and 75% of the total land

area is mountainous (Fig. 1). About 47% of the land is covered by forests. Vientiane is situated on the left bank of the Mekong River in the fertile Vientiane Plain. The climate is monsoonal and has three distinct seasons. The hot dry season begins in February, with temperatures up to 40°C. The rainy season, which is during June-October with average temperatures of 29°C, causes floods and makes transportation difficult. The cool dry season arrives in November with cooler temperatures and lower humidity.

3) Demography

In 1990, the estimated population of Lao PDR was 4.14 million in the 17 provinces and 2 special regions, and Vientiane city had 200,000 inhabitants (Fig. 2). About 85% of the population lives in rural areas with an average density of 15-20 inhabitants per km^2. The Laos are divided into 3 ethnic groups. The three main ethnic groups are the Lao Loum, the Lao Soung, the Lao Theung. The two latter groups are animist, however, the great majority of Laos are Buddhists.

1) The Lao Loum
   They comprise 55% of the total population and live in the plain area.
2) The Lao Soung
   They include 18% of the total population and live in the mountain area.
3) The Lao Theung
   They comprise 27% of the population and live in the table land area. They are semi-nomadic.

4) Education

According to the Human Development Report 1994 (UNDP), the Lao PDR was one of the countries with the highest illiteracy rates in the Western Pacific Region, which was 45 percent of adults in 1992. The illiteracy rate among females was 65 percent in 1990, which was much larger than the illiteracy rate among males.

Although all children are supposed to go to primary school from 6 to 10 years of age, only 62 percent of them were enrolled and 33 percent of them continued through the grade five (Fig. 3). Many pupils drop out of school, because most rural schools in mountainous areas are difficult to get to, minorities have language problems and girls tend to be withdrawn by their parents to help their families. Only three percent of the population completed higher secondary school and only 0.5 percent had university education.

5) Economy

According to the 1994 World Development Report, the Lao PDR was the fourteenth lowest-income country in 1992 with GNP per capita of US$ 250. The Government

introduced a New Economic Mechanism in 1986, which aimed at shifting from a centrally-planned to a market-oriented economy. A large part of the public sector has been downsized and privatized through the assistance of the UNDP and the World Bank. The abrupt cessation of assistance by the former Soviet Union in 1991, facilitated the economic reform initiated by the Laos Government.

The economy is highly dependent on agriculture and forestry. According to the Human Development Report 1994, the percentage of the labor force engagede in agriculture, industry and services sector was 76%, 7% and 17% respectively.

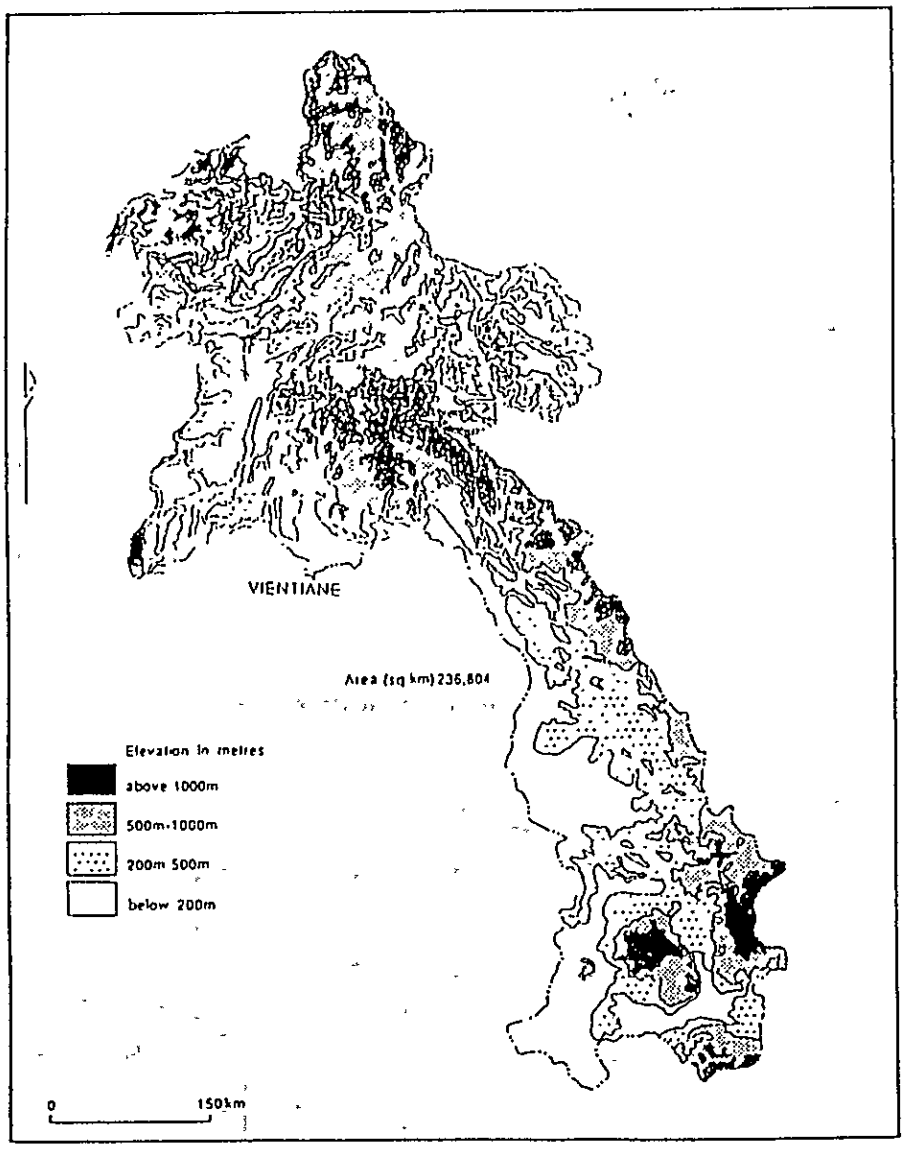


Fig. 1 Lao PDR, Elevation

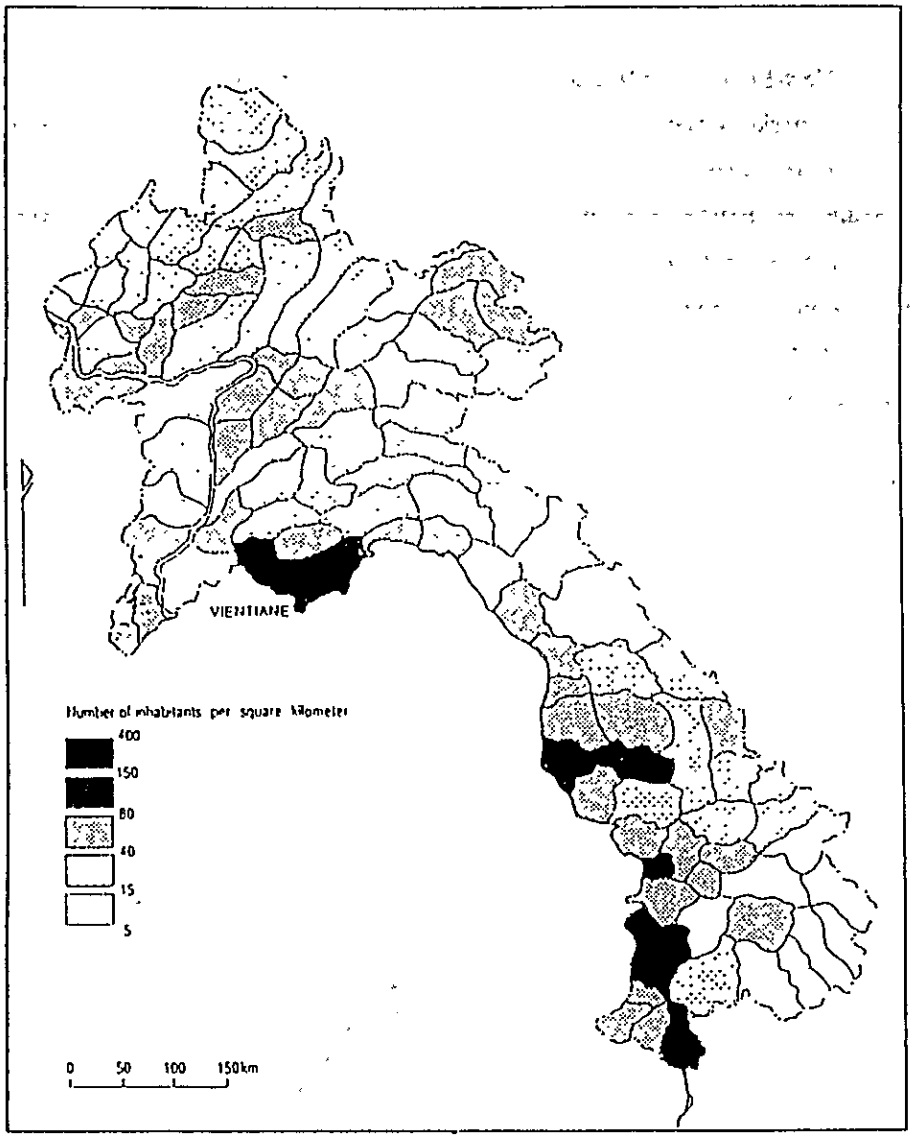


Fig. 2 Lao PDR, Population Density by District

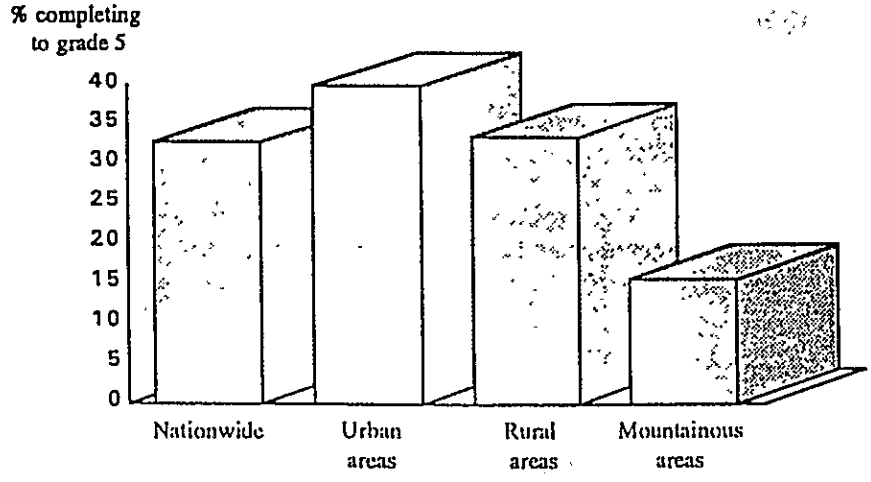


Fig. 3 The Chances of Survival
Children reaching grade 5 - 1989

III. MEDICAL SITUATION IN LAO P.D.R.

1) Background

The main health indicators compiled by the United Nations are shown in Table 2-1. Laos is one of the highest countries in terms of the infant mortality rate (104), the under 5 years mortality rate (145) and the maternal mortality rate (750). The leading illnesses of Lao children are acute respiratory infections, diarrhea, and malaria. Thousands of people are killed by pneumonia and some 1900 people by measles every year. Only 10-15% of the rural population have access to safe drinking water (Fig. 1).

A lot of children die of preventable diseases by immunization in Lao PDR. In 1974, the World Health Assembly initiated the global immunization effort under the banner of the Expanded Program on Immunization (EPI) against diphtheria, pertussis, tetanus, tuberculosis, polio and measles.

The country is divided into 17 provinces and 2 special regions and further divided into 133 districts with approximately 12 thousand villages. Each province and district has the health office or health center (fixed center). There are about 1000 medical doctors in the whole country, two-thirds of whom live in Vientiane prefecture. The population per doctor is 4350.

2) Organizational Structure

The Ministry of Health consists of 6 major departments: the Department of Planning, Finance and Coordination, the Department of Hygiene and Rehabilitation, the Department of Pharmaceutics, the Department of Personnel and Human Resources for Health, the University Medical Sciences, and the Provincial Health Services. Under the Department of Hygiene and Rehabilitation, the National Institute of Hygiene and Epidemiology is in charge of all EPI activities. Fig. 2 and Fig. 3 show the Structure of the Government of the Lao PDR and of the Lao People's Revolutionary Party.

In the National Institute of Hygiene and Epidemiology, it is divided into 4 service sections (Fig. 4). Immunization and Epidemiology service section is in charge of administration of vaccination. Water supply and Environmental health service section is in charge of epidemiological surveillance of communicable diseases. EPI activities are politically divided into 2 sections; immunization section and surveillance section, the cooperation with 2 sections should be indispensable. The organization of provincial and district health service are shown in Fig. 5 and 6.

3) EPI Activities (EPI coverage)

The EPI program officially began in 1982 with the support of UNICEF and WHO, and later the Japan International Cooperation Agency and a number of nongovernmental

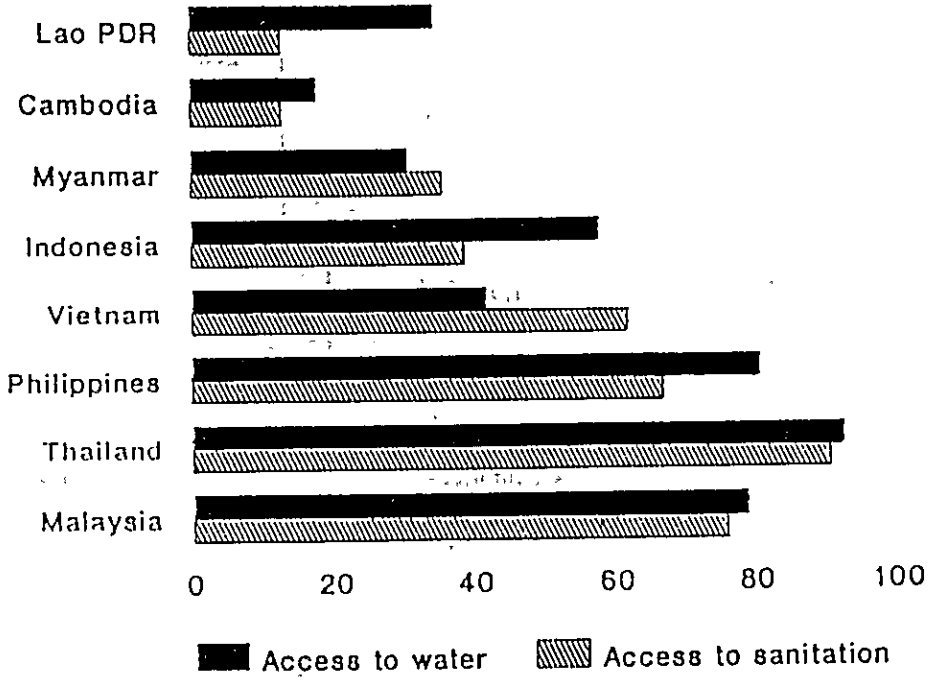
agencies. The program commenced in 1982 with pilot projects in 2 provinces and has expanded into all 17 provinces. Fig. 7 shows the number of the districts receiving EPI services from 1983 to 1993, and Fig. 8 shows the immunization coverage from 1990 to 1994. From 1987, the EPI program has rapidly accelerated and the immunization coverage has been increased. There has been a steady build-up of technical and human resources. The Lao Prime Minister decreed "On mobilizing support for the implementation of immunization activities throughout the country from 1993-1996" in April 1993. He also directed all provinces to establish Mother and Child Commissions to mirror the National Commission and assist EPI. Throughout these movement, the Lao Women's Union has also played an important role.

District Immunization Strategy

A district is considered a functional unit for EPI activities. Under the supervision of provincial health offices, each district health office is in charge of planning and management of an immunization program, which include vaccine deliveries in routine immunization and NIDs. These programs are conducted through health facilities and outreach and mobile activities to all villages. In order to provide EPI activities, all villages are classified by zones (Fig. 9).

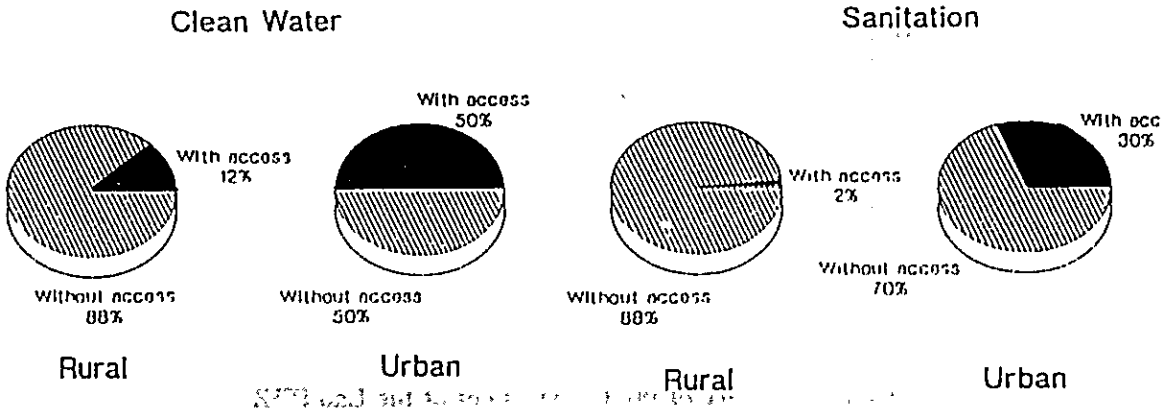
Zone 0 — This zone has the fixed center like district hospital,which can provide vaccination every day and keep vaccine vials in the refrigerators. The Maternal and Child Health (MCH) is in charge of EPI activities. Mothers have to bring their children to the fixed center.

Zone 1, 2, 3 — Vaccinators from the district hygiene station conduct to outreach/ mobile vaccination activities. They conduct vaccination sessions every 2 to 3 months.



Source: Goals for Children and Development in the '90s,UNICEF, 1993.

Lao PDR: Access to Clean Water and Sanitation



Source: UNICEF, Vientiane, 1992.

Fig. 1 Access to Clean Water and Sanitation

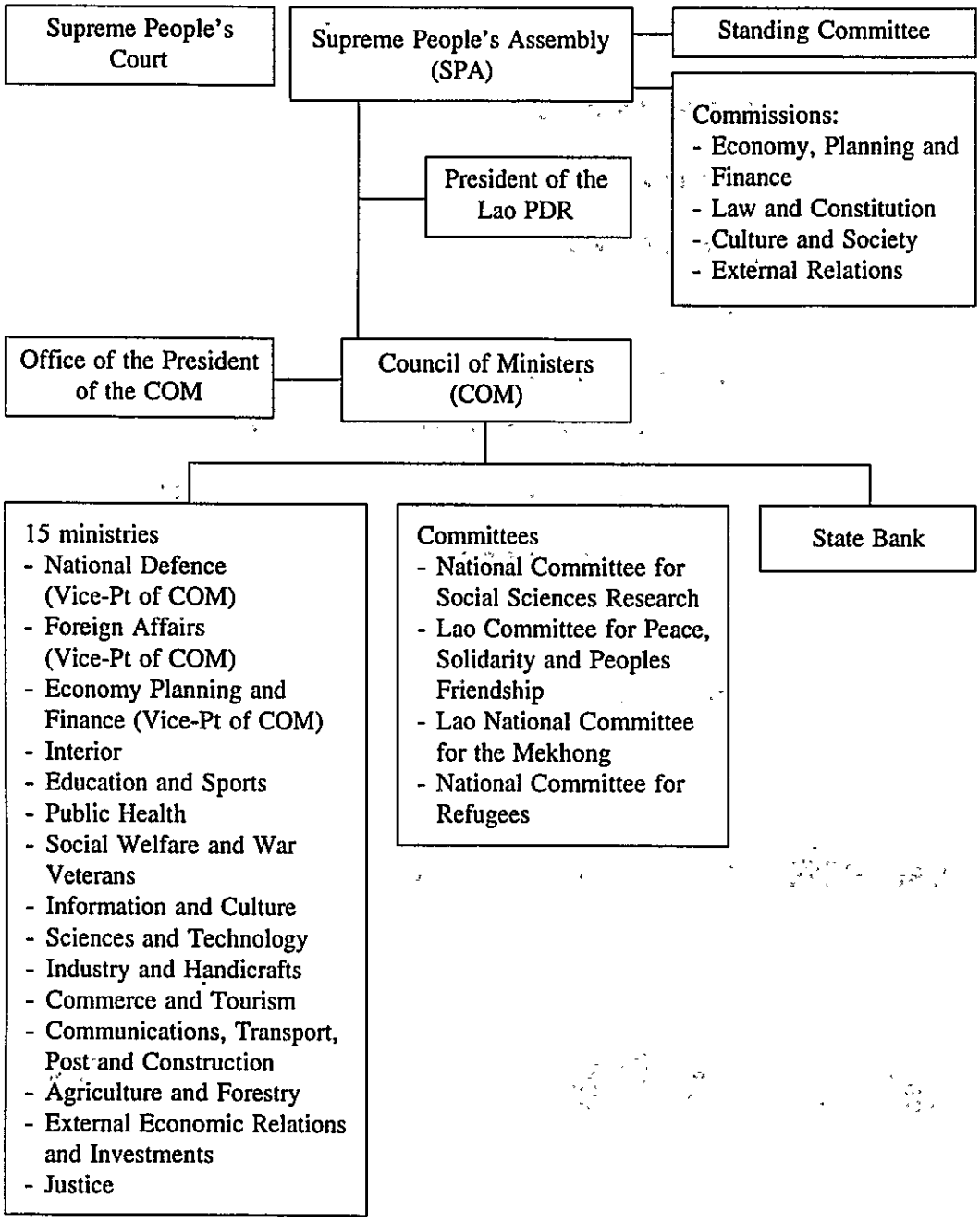


Fig. 2. Structure of the Government of the Lao PDR

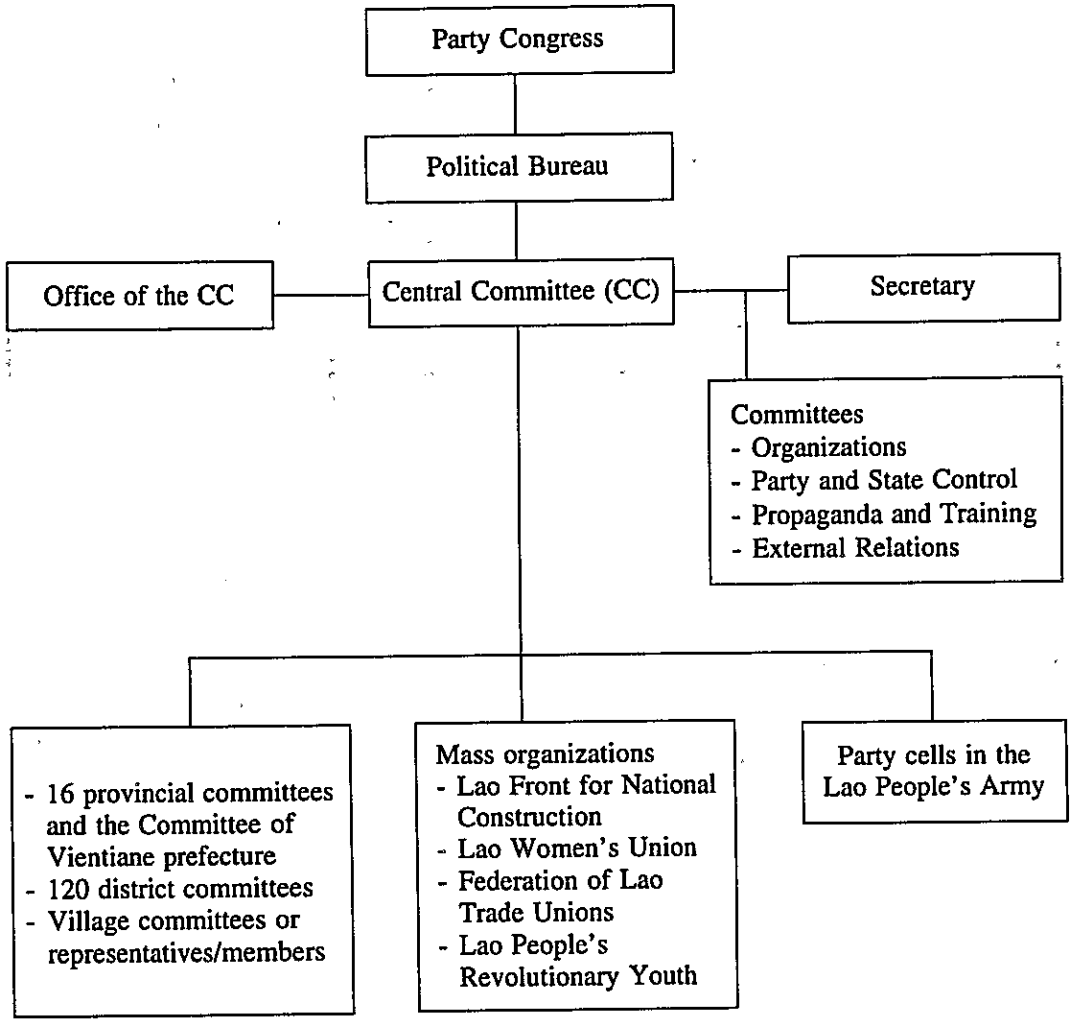


Fig. 3. Structure of the Lao People's Revolutionary Party

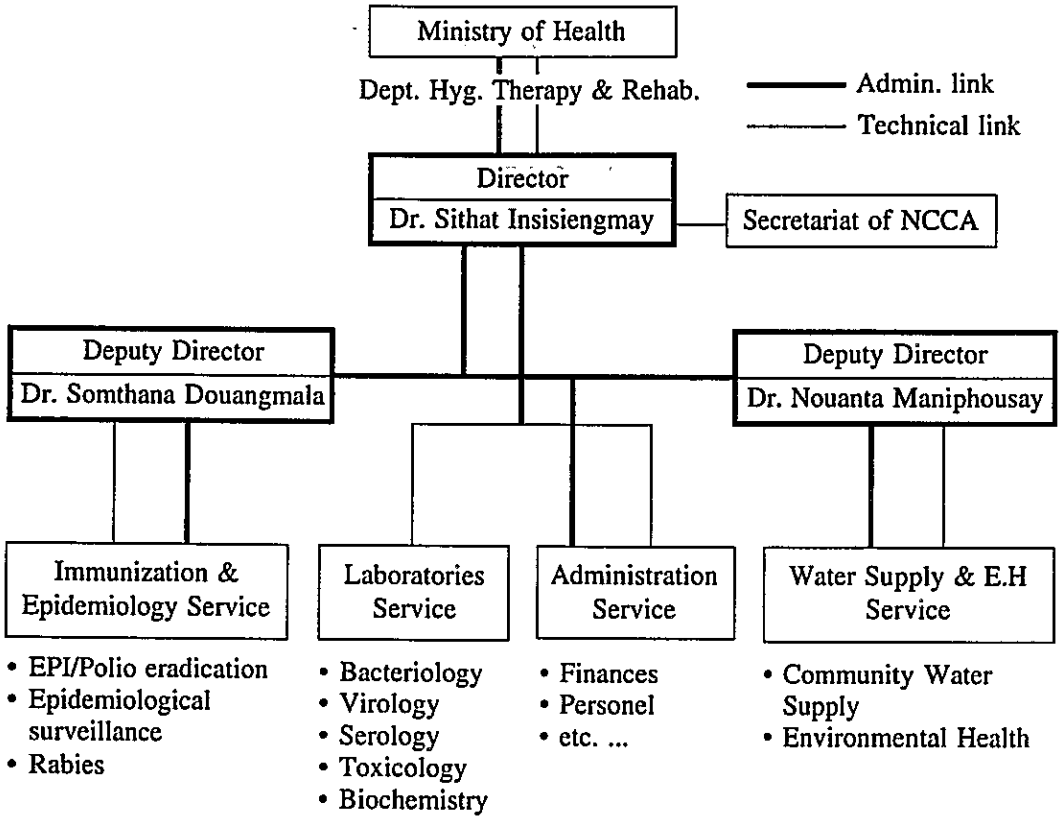


Fig. 4. National Institute of Hygiene & Epidemiology

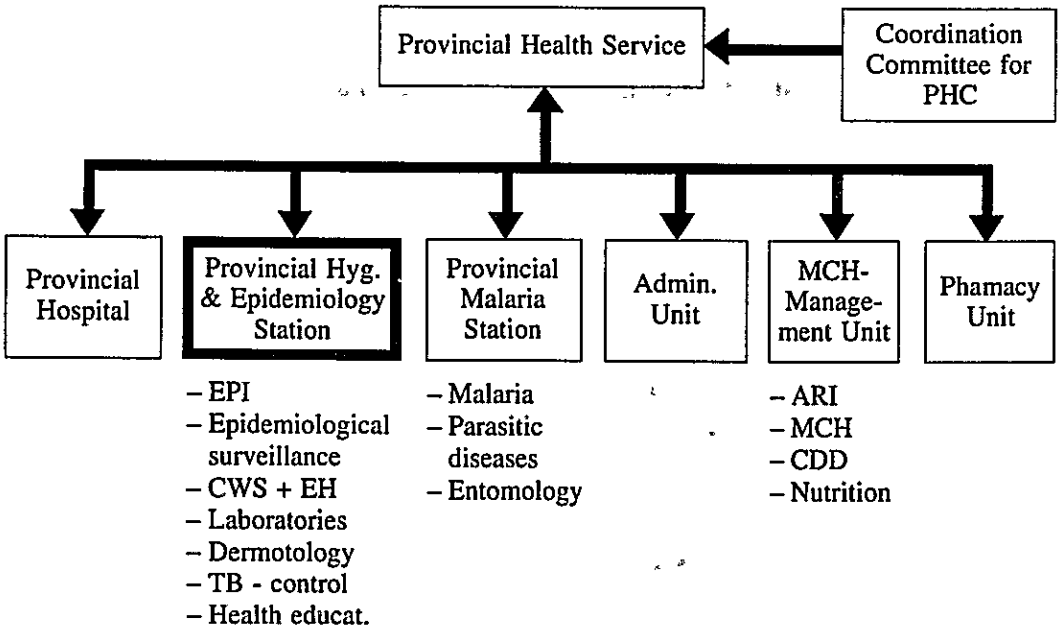


Fig. 5. The Organization of Provincial Health Service

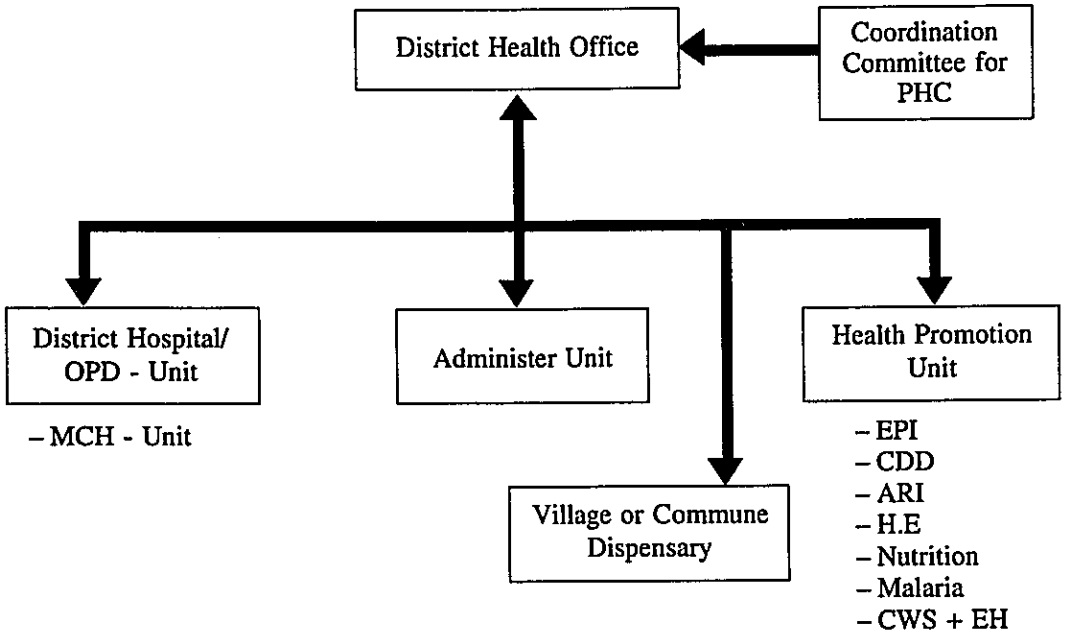


Fig. 6. The Organization of District Health Service

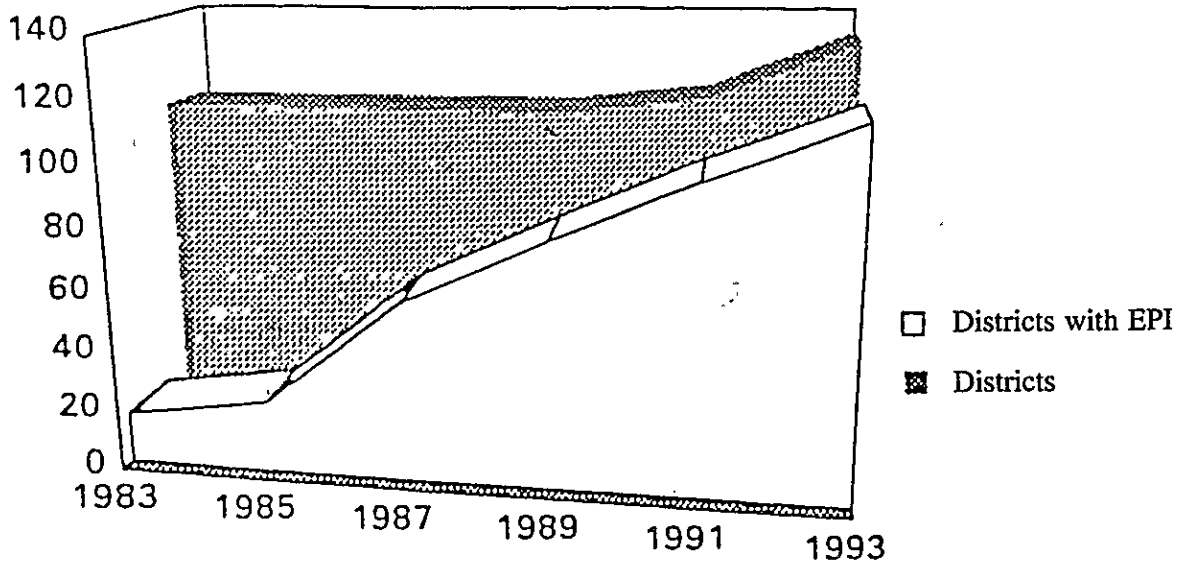


Fig. 7. A Decade of Growth
Districts receiving EPI services, 1983 - 1993

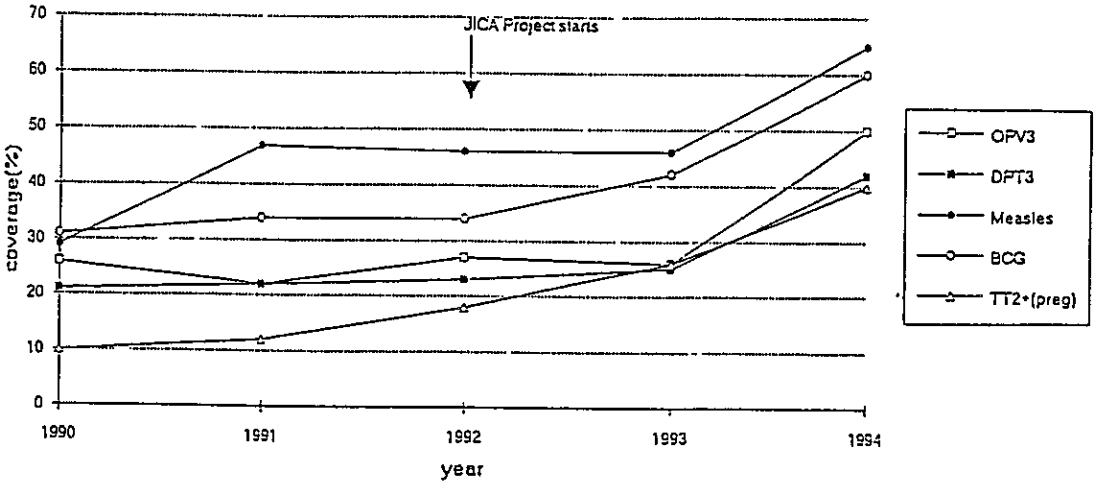
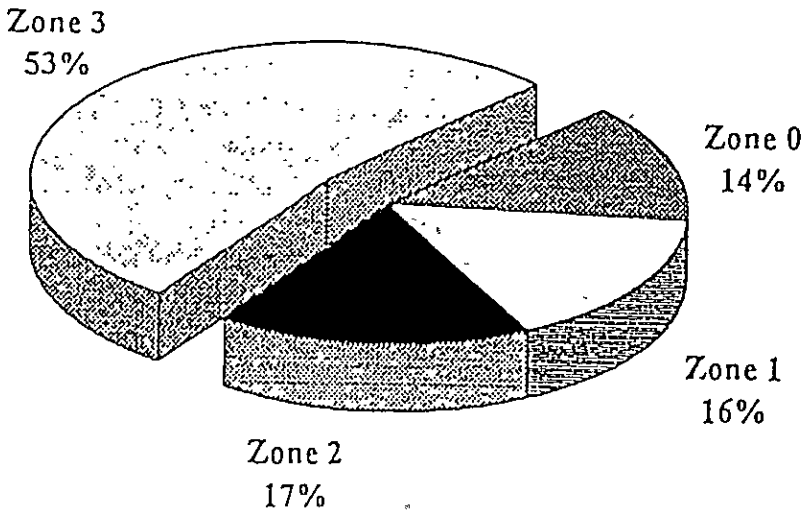


Fig. 8. EPI Coverage in Lao PDR, 1990 - 1994

Access to health services



Zone 0: *Villages within three kilometres of a government health centre*
Zone 1: *Villages within one day's bicycle reach of a government health centre*
Zone 2: *Villages within one day's travel by car, motor boat or public transport of a government health centre*
Zone 3: *Villages more than one day's travel from a government health centre*

Fig. 9. When villagers cannot reach government services, the services must go to them

IV. Poliomyelitis in LAO P.D.R.

1) Background

The Expanded Program of Immunization (EPI) started in 1982 in 2 provinces in Lao PDR with the support of UNICEF and the World Health Organization. Although the activities were expanded in 12 of 17 provinces, 121 of 133 districts until 1992, health services were not good with low immunization coverage (Fig. 1) and no effective surveillance system. The decree by Prime Minister Khamtary Siphandone in April 1993, "On mobilizing support for implementation of immunization activities throughout the country from 1993 to 1996", was very effective to facilitate EPI activities and social mobilization.

2) Incidence and Epidemiological Surveillance

As shown in Table 1, the number of confirmed polio cases was not so high. However this was not due to the good control of poliomyelitis, but to the under report caused by mediocre reporting system. Line list of reported Acute Flaccid Paralysis (AFP) cases of 1994 is shown in Table 2. Ten of sixteen reported cases were found to be the AFP cases after investigation by EPI staff. In six of ten AFP cases stool specimens were collected, and two specimens were positive with polio virus type 3. Six cases were diagnosed as confirmed polio by WHO's standard.

A sentinel surveillance system was established in 1989. Although 34 centers were involved in this system utilizing provincial and district hospitals, the system did not function effectively. Four reportable diseases: polio, measles, neonatal tetanus, and cholera, were focused on by the new epidemiological surveillance system set up in March 1994. Weekly reports are supposed to be sent to NIHE by provincial hospitals (Institute of Hygiene and Epidemiology), and monthly reports to provincial hospitals by district hospitals (Institute of Hygiene and Epidemiology). However from the practical point of view, reports tend to be late, especially report from district to province. Fifty days in average were consumed to report the 6 AFP cases to NIHE from the onset. Some district use letters instead of telegram due to limited budget, or wait sending reports until next visit to provincial hospital to receive vaccines.

As the reported cases dose not reflect the real situation, NIHE and JICA has been conducting the Active Search to find out the polio cases and investigate immunization coverage in villages level. They visited 18 provinces, 66 districts, and 366 villages from March to December 1994. As shown in Fig. 2 many old polio cases were discovered, which means low quality of AFP reporting system in Lao PDR.

3) Clinical and Laboratory Diagnosis

Clinical diagnosis is based upon WHO's criteria. Stool specimens are supposed to be sent to Thai NIH from Dec 1994. Two cases were diagnosed by detection of polio virus and two cases by death in 1994. Although WPRO has been discussing the revision of AFP criteria based on laboratory examination, more efforts to collect the adequate specimens are needed in Laos.

4) Vaccine Supply and its Quality Control

Polio, BCG, and DPT vaccine are not produced domestically. They are donated by UNICEF, WHO, Rotary, JICA, JPA(Japan Pediatric Association), the Australian government and other organizations. One large cold room donated by JICA and several freezers keep vaccines for at most six months at NIHE, freezer is available for three-month stock at provincial level, refrigerator for six-week stock at district level. When we visited Lac Sao district health station to see the cold chain, the refrigerator was out of order and the temperature was too high. We repaired it without difficulty. I firmly believe that training for management of cold chain would be essential.

5) Routine Immunization and NIDs

The Immunization teams visit villages four times yearly. Outreach teams are responsible for remote areas and MCH health staff for zone 0 area. Regular immunization coverage is not so high. As shown in Fig. 2 OPV 3 coverage was under thirty percent in 1993.

The SNIDs were started in 24 districts of 17 provinces in December 1990 and January 1991. The objective of SNIDs and NIDs is to provide vaccines to all children under 5 years. Supplementary immunization activities in Polio endemic countries are shown in Table 3. It takes whole one month to conduct one round immunization in Lao PDR. Measles and DPT vaccination are combined with NIDs due to limited human resources and geographical characteristics.

In 1994 substantial NIDs was firstly implemented at 104 districts with 79 percent coverage of target children. (Table 4, 5) However there were some pocket areas, which means lower coverage of immunization compared with surrounding area, such as Attapu, Bokao, and Xlanghon Hongs province. NIDs were carried out in 132 districts this year. The coverage is estimated higher than last year.

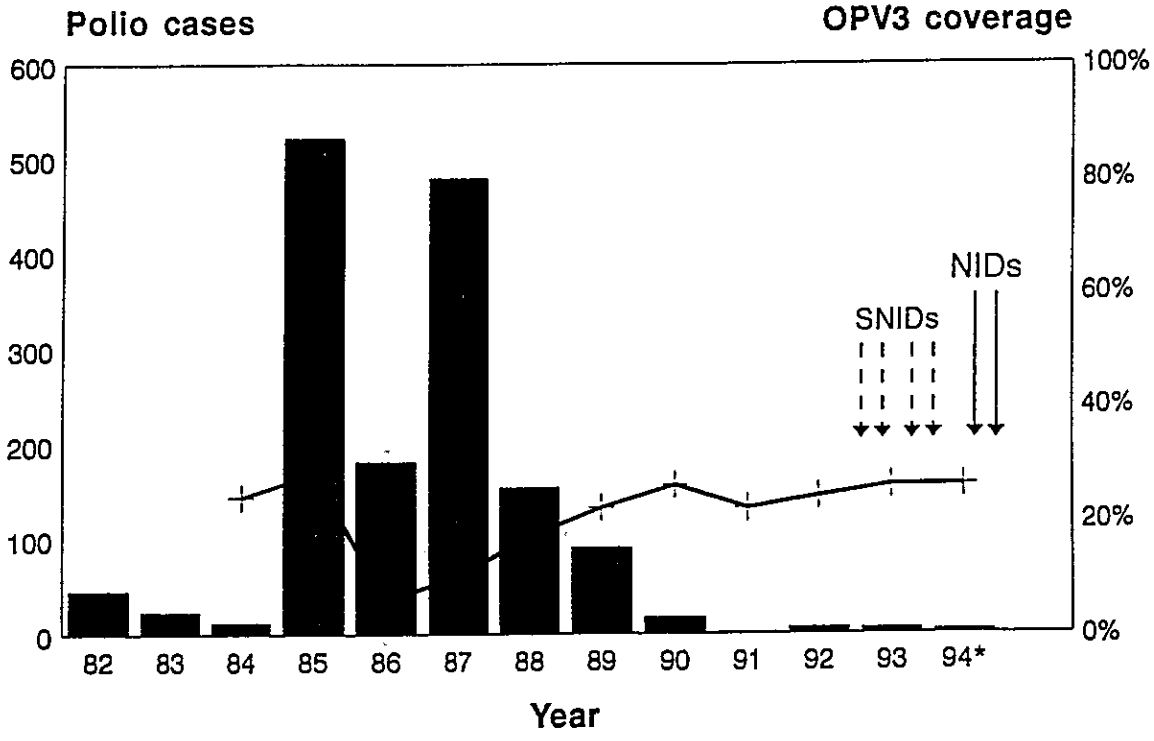
Table 1. Total AFP Cases reported, confirmed polio cases and wild-virus associated cases 1992-1994

COUNTRY	TOTAL AFP CASES REPORTED			CONFIRMED AS POLIO			WILD VIRUS ISOLATED		
	1992	1993	1994	1992	1993	1994*	1992	1993	1994
Cambodia	146	135	299	146	135	296	0	4	27
China	2488	1818	2606	1372	538	149	***	42	5
Lao PDR	10	12	9	7	7	5	0	0	***
Malaysia	0	17	15	0	0	0	0	0	0
PNG	73	16	16	0	0	0		0	0
Philippines	47	88	122	13	15	7	8	5	0
S.Pacific	0	0	1	0	0	0	0	0	0
Viet Nam	653	607	329	557	452	93	26	150	21
Others	c	0	1	0	0	0	c	0	0
TOTAL	3417	2693	3398	2095	1147	550	34	201	53

* 1994 data incomplete

*** Data not available

Fig. 1. Reported Cases of Polio, OPV3 Coverage and Supplementary Immunization Activities Laos P.D.R. 1982-1994*



* provisional data based on annual trends and information available as of 30 Nov 1994
Data Sources: WHO/WPRO CEIS. WPRO Polio Surveillance Reports

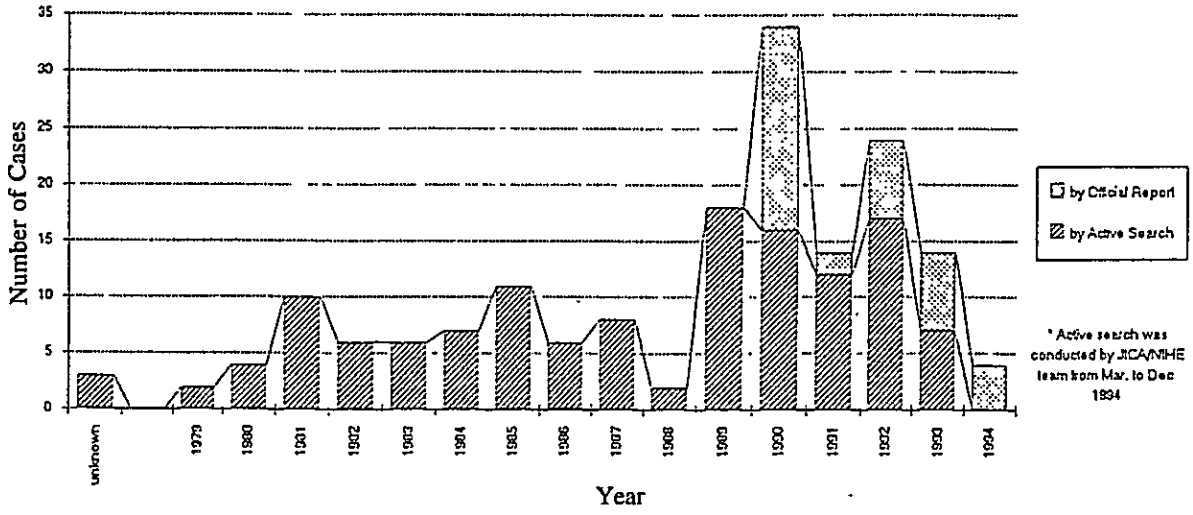


Fig. 2. Polio Cases in Lao PDR, 1979-1994

Table 2

Line List of Reported AFP Cases, 1994

No.	Name	Sex	Date of Brith	Province	District	Date of Onset	OPV History	Date of Report to NIHE	Date of Investi-gation	AFP	Date of Specimen Collection			60 Datys Follow-up			WHO-ontena Diagnosis	JICA Expert Diagnosis
											1st	2nd	Result	Date of Exam.	Date of Death	Residual Paralysis		
01-94-01	Soudjia	F	1990	Vienthane Munucipality	Sisathanak	10/6/94	X2	12/5/94	12/5/94	No	12/6/94	No		No	Unkn own	Unkn own	Non-AFP	Encephalths
07-94-02	Nq Pee	F	1983	Houaphanh	Vienqcal	8/6/94	X1	15/6/94	15/6/94	Yes	No	No		11/2/95	No	No	Discarded	GBS
04-94-03	Than Pin Kao	M	19/8/89	Cudomxey	La	May-94	X4	1/8/94	1/8/94	No	No	No		14/10/94	No	No	Non-APP	Spastic Hempleqia
01-94-04	Ny Soudjai	F	26/11/69	Vikentiane Municipality	Naxathong	15/7/94	X3	29/8/94	29/8/94	Yes	30/8/94	31/8/94		24/11/94	No	Yes	Confirmed	Polio
13-94-05	Boun Thai	M	26/4/92	Savannakhet	Nong	20/4/94	X0	28/9/94	26/9/94	Yes	14/10/94	No		26/9/94	No	Yes	Confirmed	Polio
13-94-06	Pu	F	11/11/85	Savannakhet	Xaboury	7/9/94	Unknown	20/9/94	20/9/94	No	21/9/94	22/9/94		18/10/94	No	No	Non-AFP	Injury
06-94-07	Nq Linda	F	27/22/92	Luanqprabang	Luanqprabang	Unknown	X3	15/9/94	15/9/94	No	No	No		18/10/94	No	No	Non-AFP	Spastic Hemipleqia
01-94-08	Nq Senq Alun	F	1981	Vientiane Municipality	Habraiphong	19/10/94	X0	29/10/94	19/10/94	Yes	30/10/94	31/10/94		31/12/94	No	No	Discarded	GBS
05-94-09	Nq Senq	F	1992	Bokeo	Houayxai	28/8/94	Unknown	24/10/94	27/10/94	Yes	25/10/94	27/10/94		8/11/94	No	Yes	Confirmed	Polio
01-94-10	Pane	F	1980	Vientiane Municipality	Xathani	22/20/94	X0	4/11/94	10/11/94	Yes	No	No		Not done	6/11/94	Died	Confirmed	GBS by Inteview
02-94-11	Bountianq	M	1989	Phonqsaty	Khoua	26/9/94	X3	10/10/94	10/11/94	Yes	No	No		15/12/94	No	No	Discarded	Nomalty Interview
01-94-12	Somphenq	F	1979	Vientiane Municipality	Hatxaiphong	12/11/94	Unknown	22/11/94	22/11/94	No	22/11/94	No		No	Unknown	Unknown	Non-AFP	Encephalrtis
06-94-13	Phonetip	F	1988	Luanqprabang	Luanqprabang	Nov-94	X0	22/11/94	29/11/94	Yes	30/11/94	1/12/94		4/1/95	No	Yes	Confirmed	Polio
01-94-14	Nq Johny	F	1990	Vientiane Province	Thoulakhom	Oct-94	X2	29/12/94	31/12/94	No	1/1/95	2/1/95		Not yet	Unknown	Unknown	Non-AFP	Gontis
01-94-15	Nq Lita	M	30/10/93	Luanqprabang	Luanprabang	22/10/94	X2	25/12/94	27/12/94	Yes	4/1/95	5/1/95		29/1/95	No	No	Pending	Nomal
12-94-16	Mai	F	1987	Khammouan	Hinboun	11/12/94	X0	25/12/94	10/1/95	Yes	No	No		Not done	10/1/95	Died	Confirmed	Polio by Interview

Table 3. Supplementary Immunization Activities in Polio Endemic Countries Western Pacific Region, 1992 - 1994

Country	# SNID	# NID	Coverage	Other Antigens	# Immunized
Cambodia	1	1	92%	Vit A*	1.4 million
China	1	2	> 80%	–	81 million
Laos	2	1	80%	Measles DPT	650000
PNG	0	0	–	–	NA
Philippines	0	2	> 90%	Vit A, TT Meas	9.8 million
Viet Nam	1	2	> 90%	Vit A, TT	9.7 million
Total	5	8	85%	–	103 million

NOTE: 94.7% of the WPR developing country population lives in the 6 endemic countries.

* in limited areas
WRPOEND.CH3

Table 4. National Immunization Days 1994, Lao PDR

January and February 1994

104 Districts

National Immunization Days 1995, Lao PDR

January and February 1995

132 Districts

Table 5. Result of NIDs 1994

NATIONAL IMMUNIZATION DAYS 1994

No.	Province	Code	District	No.	Number villages	Results Round 1				Results Round 2			
						% village reached	OPV Coverage under 6	OPT Coverage under 1	Messies Coverage under 2	% village reached	OPV Coverage under 6	OPT Coverage under 1	Messies Coverage under 2
1	Vientiane M.	1.1	Chartabond		37	100	63	10	10	100	54	5	2
		1.2	Sikhothbong		59	100	34	10	5	100	36	0	0
		1.3	Sayertha		52	100	30	7	2	100	31	3	2
		1.4	Sysetarank		40	100	38	28	13	100	45	30	5
		1.5	Neseythang		56	100	62	61	17	100	63	57	12
		1.6	Saythany		123	100	63	34	13	100	52	19	6
		1.7	Hatasylong		75	100	62	36	5	100	56	27	5
		1.8	Prilalath		36	100	73	47	11	100	55	60	5
			Other		67	100				100			
			TOTAL	5	543	100	56	27	11	100	58	23	5
2	Phongsaly	2.1	Phongasly		93	100	105	7	20	100	66	10	1
		2.2	May		131	82	103	20	51	100	63	25	0
		2.3	Khoua		134	100	115	3	20	100	136	43	18
		2.4	Semphern		96	100	144	108	48	100	146	26	19
		2.7	Bon Nolie		89	100	709	3	3	100	148	10	3
			TOTAL	6	522	116	30	30	100	106	26	9	
3	Luang Namtha	3.1	Namtha		79	100	77	57	118				
		3.2	Sing		105	100	82	25	20				
		3.3	Long		134	51	29	16	17				
		3.4	Vlangphokha		69	100	43	0	47				
			TOTAL	4	387	83	58	31	59				
4	Oudomsay	4.1	Xay		183	100	104	26	18	100	102	31	4
		4.2	La		73	100	77	33	11	100	95	24	1
		4.3	Noma		118	100	118	59	28	100	98	36	3
		4.4	Berg		106	100	111	117	75	100	99	6	4
		4.5	Hourn		171	100	105	27	30	100	87	33	2
			TOTAL	5	651	100	106	47	32	100	86	28	3
5	Bokeo	5.1	Houslasy		144	73	73	12	5		73	10	2
		5.2	Tharoung		56	96	86	7	11		84	0	0
		5.3	Phekia		24	100	98	0	0		86	0	0
			TOTAL	3	223	82	51	3	3		74	6	1
6	Luang Prabang	6.1	Luang Prabang		128	100	99	13	12	100	103	17	12.
		6.2	Xlang Ngaun		103	100	69	37	23	100	68	82	13
		6.3	Nang		80	100	51	73	41	100	97	86	6
		6.4	Pak Ou		80	100	108	103	27	100	110	79	11
		6.5	Nambak		105	100	100	79	71	100	93	86	9
		6.6	Ngay		167	100	100	41	72	100	97	62	8
		6.8	Phanasay		91	100	118	87	70	100	103	84	3
		6.9	Champrat		86	100	90	60	20	100	106	47	13
		6.11	Phokoon		47	100	59	93	86	100	158	114	18
			TOTAL	9	960	100	95	67	43	100	99	59	10
7	Houaphan	7.1	Samnaure		147	84	94	42	10	51	100	12	6
		7.2	Xlangkho		248	35	79	0	9	39	94	36	0
		7.4	Vlengxay		134	36	113	12	10	93	107	5	3
		7.5	Honamauang		100	52	71	74	55	52	43	38	6
			TOTAL	4	629	56	90	24	16	62	92	23	4
8	Sayabouli	8.1	Sayabourt		116	100	104	45	54	100	116	27	5
		8.2	Plang		86	100	112	89	94	100	106	53	7
		8.3	Paklay		90	100	64	92	76	100	113	76	15
		8.4	Kanathao		58	100	51	41	21	100	87	44	10
		8.5	Botane		32	100	67	44	19	100	57	38	6
			TOTAL	5	360	100	79	63	69	100	100	60	11
9	Xieng Khouang	9.1	Pak		113	100	94	63	16	100	54	18	6
		9.2	Kam		74	100	93	11	7	66	76	7	0
		9.3	Nonghat		115	69	77	14	16	59	54	9	2
		9.4	Khoun		132	87	79	14	11	81	69	13	6
		9.5	Phoukhout		81	77	68	41	33	77	68	107	20
		9.6	Phaxay		40	86	78	42	189	85	71	48	10
			TOTAL	5	638	86	86	30	14	78	64	21	6

NATIONAL IMMUNIZATION DAYS 1994

No.	Province	Code	District	No.	Number villages	Results Round 1				Results Round 2			
						% village reached	OPV Coverage under 6	OPT Coverage under 1	Messies Coverage under 2	% village reached	OPV Coverage under 6	OPT Coverage under 1	Messies Coverage under 2
10	Vientiane P.	10.1	Phons Hong		107	100	88	63	61	100	91	90	20
		10.2	Touiakhom		77	100	88	79	36	100	88	88	31
		10.3	Kao Oudom		30	100	63	59	26	100	163	144	3
		10.4	Kasy		79	100	83	115	36	100	88	109	29
		10.5	Vangvisng		903	100	93	24	14	100	88	24	10
		10.6	Saythany		123	100	63	34	13	100	52	19	6
		10.7	Ham		45	100	39	33	22	100	86	59	62
		10.8	Fauang		58	100	80	62	105	100	92	84	30
		10.9	Sarakham		55	100	75	57	46	100	86	46	10
			TOTAL	9	578	100	80	81	46	100	59	74	28
11	Bolikhamsay	11.1	Pakaeme		75	100	70	27	14	100	70	25	12
		11.2	Thapaond		32	100	87	46	60	100	49	14	2
		11.3	Pakkadng		68	100	68	39	4	100	52	31	2
		11.4	Bankhane		60	85	85	76	18	100	89	77	15
		11.5	Khamakauth		230	92	88	25	16	100	105	65	8
			TOTAL	5	456	94	78	38	18	100	77	41	8
12	Khammouane	12.1	Thakhak		133	100	99	87	64	100	96	90	3
		12.2	Marabay		161	100	82	65	44	66	37	31	4
		12.3	Nang Bak		69	100	56	63	40	100	76	64	35
		12.4	Hiboun		178	57	75	49	15	100	100	123	26
		12.6	Nommalath		111	100	79	70	75	100	64	48	13
		12.7	Sabonglay		54	100	111	61	69	100	57	43	17
			TOTAL	6	70	97	88	86	48	92	78	76	16
13	Savannakhet	13.1	Khanthabound		134	100	88	62	21	100	86	48	14
		13.2	Outamphone		105	100	96	3	1	100	92	0	0
		13.3	Atsaphnthong		127	100	93	66	63	66	63	33	4
		13.4	Phun		147	88	53	10	1	97	61	22	7
		13.6	Saponh		260	63	49	14	6	62	40	8	6
		13.7	Thapanthong		88	93	84	15	11	81	74	0	0
		13.8	Sangkhone		182	100	90	32	8	100	74	27	2
		13.9	Champone		182	100	89	62	12	100	73	48	9
		13.10	Xonnbuy		95	100	73	18	19	100	66	8	3
		13.11	Xayboury		81	100	90	16	5	100	71	6	0
			TOTAL	10	1361	89	83	34	14	90	72	28	6
14	Saravane	14.1	Seravana		177	100	98	58	6	100	91	35	4
		14.3	Toumiana		88	100	97	70	51	100	142	55	10
		14.4	Lakhonpheng		93	100	9o3	48	36	100	100	45	4
		14.5	Vapy		63	100	99	9	6	100	95	75	7
		14.6	Khongsadone		105	100	99	9	3	100	94	22	2
		14.7	Laongam		110	100	97	20	24	100	94	40	0
			TOTAL	6	617	100	98	33	15	100	92	43	4
15	Sekong	15.1	Luang Prabang		128	100	99	13	12	100	103	17	12
		15.3	Nang		80	100	51	73	41	100	97	86	6
		15.4	Pak Ou		80	100	108	103	27	100	110	79	11
			TOTAL	9	960	100	95	67	43	100	99	59	10
16	Champassak	16.1	Pakas		62	100	90	12	7	100	92	9	6
		16.2	Sanamsomban		83	100	100	2	2	100	99	6	2
		16.3	Baorisng		95	100	99	2	13	100	99	7	2
		16.4	Paksong		102	100	71	3	2	100	61	3	2
		16.5	Pathonouhone		95	94	89	8	6	94	79	6	3
		16.6	Phanthang		115	100	90	61	11	100	91	4	1
		16.7	Champasseck		92	100	75	83	29	100	96	6	2
		16.8	Champone		182	100	89	62	12	100	73	8	9
		16.9	Mourispamak		84	100	74	3	10	100	99	5	2
		16.10	Khong		131	100	76	4	5	100	79	6	1
			TOTAL	10	591	99	85	20	9	99	89	6	2
17	Attopeu	17.1	Saysetha		32	88	58	0	0	88	53	0	0
		17.2	Samkysay		23	100	56	0	0	100	74	0	0
		17.3	Sanamoay		49	61	36	0	0	61	67	0	0
		17.4	Phunong		23	39	38	0	0	39	34	0	0
			TOTAL	4	127	71	47	0	0	71	58	0	0
18	Xienghon-Hongsa	18.1	Xl;anghone		82	24	13	23	24	37	10	19	5
		18.2	Hongsa		75	42	18	21	23	55	14	20	14
			TOTAL	2	168	33	18	22	23	46	11	20	10
	TOTAL			104	9923	91	81	40	24	85	79	31	7

V. Active Search

1) Background

There is a national surveillance system for the 4 notifiable diseases; AFP, neonatal tetanus, measles, and cholera. However, it has not been working effectively. Although about 70% of provincial hygiene stations report weekly, their reports don't cover cases at district levels. The purpose of active search is to identify the actual situation of poliomyelitis for the establishment of a reliable surveillance system and to provide EPI staff with clinical knowledge about poliomyelitis.

2) Active Search in Pakkading and Lac Sao districts

Methods

Date: 13 March 1994 to 16 March 1994

Place: Paksane district and Khamket district in Bolikhamxay province

The team of active search consists of a member of staff from the epidemiology section of NIHE and a JICA expert and JICA trainees and a Bolikahamxai provincial EPI manager and Paksane and Khamket district EPI staff. After our brief supervision of the provincial and district EPI activity, we chose villages from each zone 0, 1, 2, 3. We chose 9 villages in Paksane district; Namdon, Viencome, Namsan, Namku, Ponsi, Phomsai, Haxsaikam, Donsai,and Paksane. We chose 9 villages in Khamket; Tompe (Lao Soung's village), Nampe, Nammo, Km 5 (the name of village is unknown, it is 5 km far from Kampe) Km7, Km10, Km12, Koupe, Boo. We went to provincial and district hospitals to obtain information about AFP. We interviewed in each village whether they had any AFP cases or paralyzed cases under 15 years of age. We also chose one village from each zone 0, 1, 2, 3, and investigated the coverage of OPV3 and NIDs by asking mothers. The coverage of OPV3 is considered the indicator of adequate routine immunization. Table 4-1 shows the number of samples in each villages.

Result

Fig. 4-1 indicates the correlation between age and OPV coverage and Fig. 4-2 shows age and NIDs coverage. Fig. 4-3 shows the incident rate in each age group. There was no difference on the coverage in each age.

Fig. 4-4 clarifies the correlation between the zone and OPV coverage and Fig. 4-5 shows zone and NIDs coverage. Average OPV3 coverage was 57% and OPV1 coverage was 83%. OPV3 coverage tended to decrease as the village was far from a fixed center (zone 1-77%, zone 2-63%, zone 3-40%). On the other hand, NIDs coverage was high even in remote areas (zone 1-100%, zone 2-63%, zone 3-80%).

Fig. 4-6 and Fig. 4-7 illustrates the OPV and NID coverage in Tompe (Lao Soung village-zone 2). The OPV and NIDs coverage in Tompe village were much lower than the other zone 2 villages (OPV3 in Tompe-17%, NID2 in Tompe-17%, OPV3 in zone 2-53%, NID2 in zone 2-63%).

Fig. 4-8 reveals dropout rates of OPV in each zone. Average OPV3 coverage was 57% and OPV1 coverage was 83%, which mean 26% in dropout rate. OPV3 coverage tended to decrease from zone1 to zone 3. The dropout rate increased from zone1 to 3. (zone 1-15%, zone 2-23%, zone 3-50%). Fig. 4-9 shows dropout rates of NIDs in each zone. Average NIDs2 coverage was 76% and NID1 coverage was 85%, so the dropout rate was 9%. The dropout rate tended to increase from zone1 to 3.

Fig. 4-10 and Fig. 4-11 indicate the relationship between age and dropout rate of OPV and NIDs. 0 year's dropout rate are higher than that of other ages.

Fig. 4-12 shows the percentage of the children who had vaccination cards. 72% of mothers kept vaccination cards in their house.

Table 4-2 shows the AFP case list through this Active Survey in Paksane and Khamket districts.

Comments

It is natural that the coverage of routine immunization tends to decrease as villages are located further away from the health center. That is why the supplementary immunization should be further emphasized, especially in remote areas. 63% of coverage on NID was not sufficient to eradicate poliomyelitis.

According to the previous investigation carried out by Dr. Chosa and Dr. Kuroiwa, low coverage of routine immunization in zone 0 was one of problems. It seems to be necessary to promote social mobilization. Although this active search couldn't identify the immunizational situation in zone 0, further investigation to understand the reason of low coverage should be needed.

The high dropout rate of routine immunization was one of problems too. 31% of first immunized children didn't complete three time vaccination. Judging from simple interview, inadequate information system and misunderstanding for side reaction of inoculation might be one of reasons. Further studies are necessary to make out the reason of high dropout rate and give all children three time vaccination.

There were a lot of so-called 'Pocket Areas' where the coverage is much lower than that of surrounding areas. In Tompe village, where Lao Soung live, the OPV and NIDs coverage were extremely low. Some mothers had never heard of immunization and NIDs. A district EPI staff didn't understand the minority language.

We found 12 old polio cases under 15 years of age through our active search. The onset of paralysis was from 1983 to 1994. Even if there was the outbreak of poliomyelitis

in Khamket district in 1992, we could not find any new polio cases. In Paksane and Khamket district, all of the 12 cases were not reported. Some doctors in district hospitals didn't have knowledge of the AFP surveillance system. The number of cases reported to NIHE seemed to be underestimated. It is necessary to increase the rate of medical reporting that comes from villages to districts and districts to provinces.

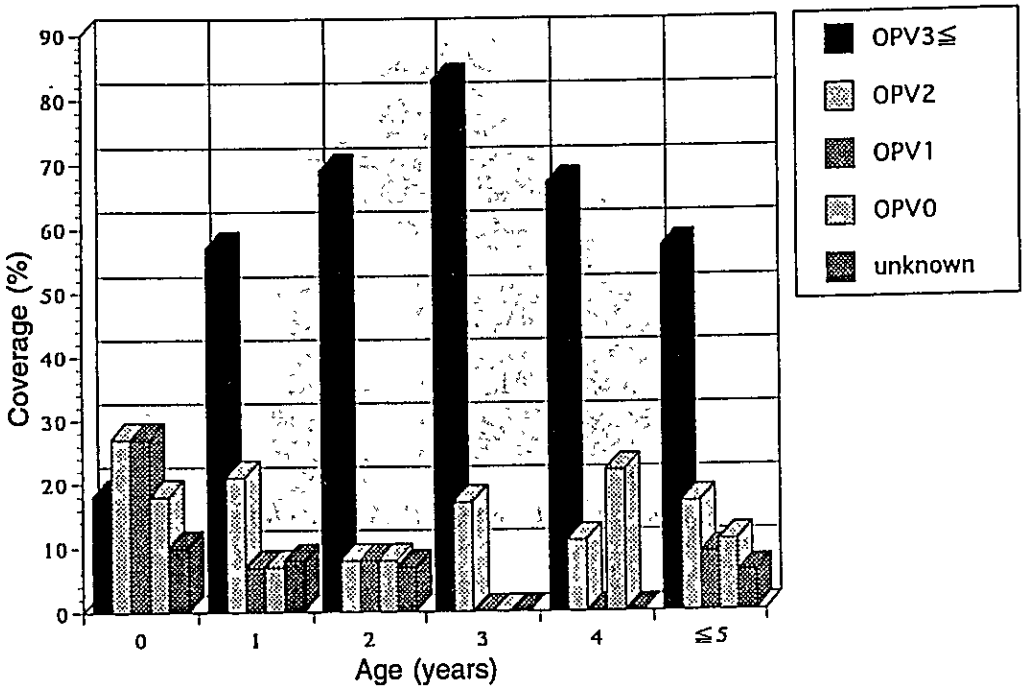


Fig. 4-1. OPV Coverage in Paksane and Khamket Districts

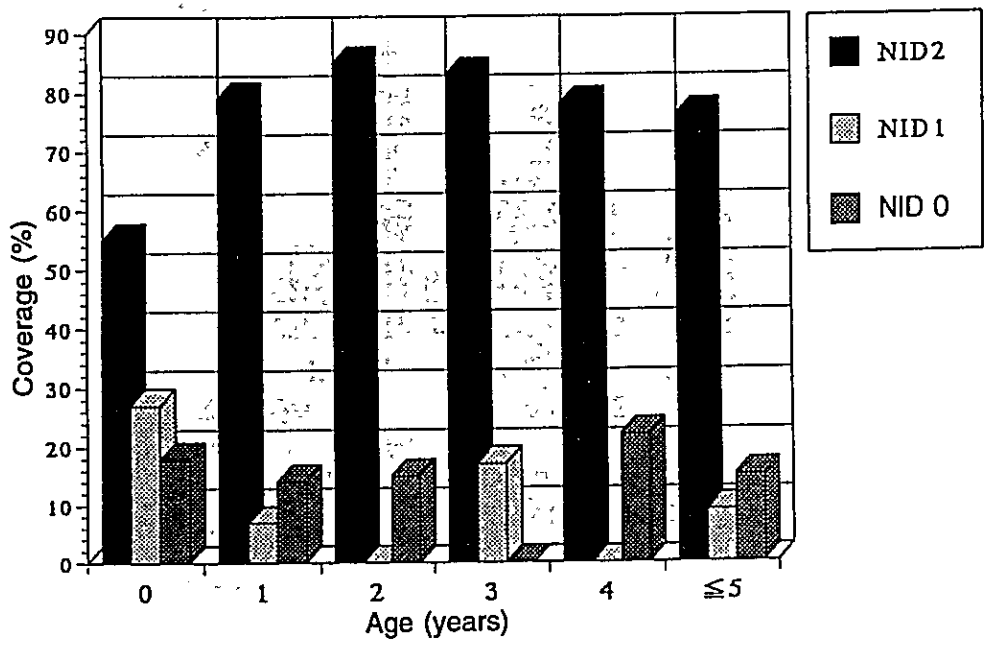


Fig. 4-2. NIDs Coverage in Paksane and Khamket Districts

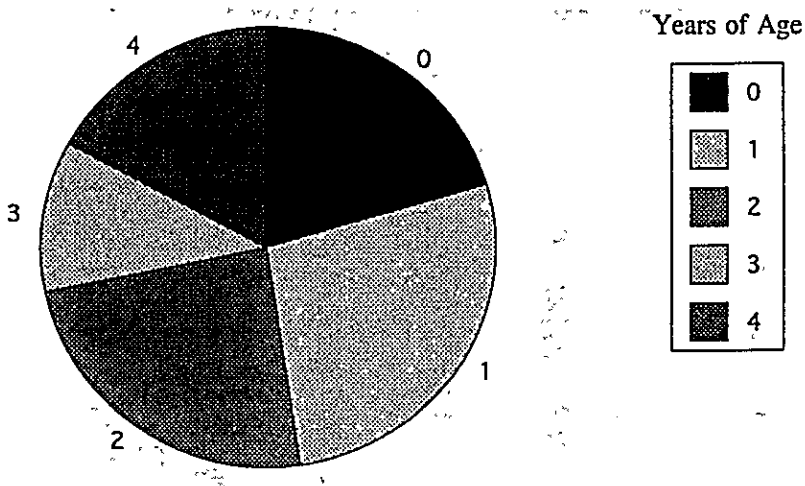


Fig. 4-3. Percentage of each Age Group

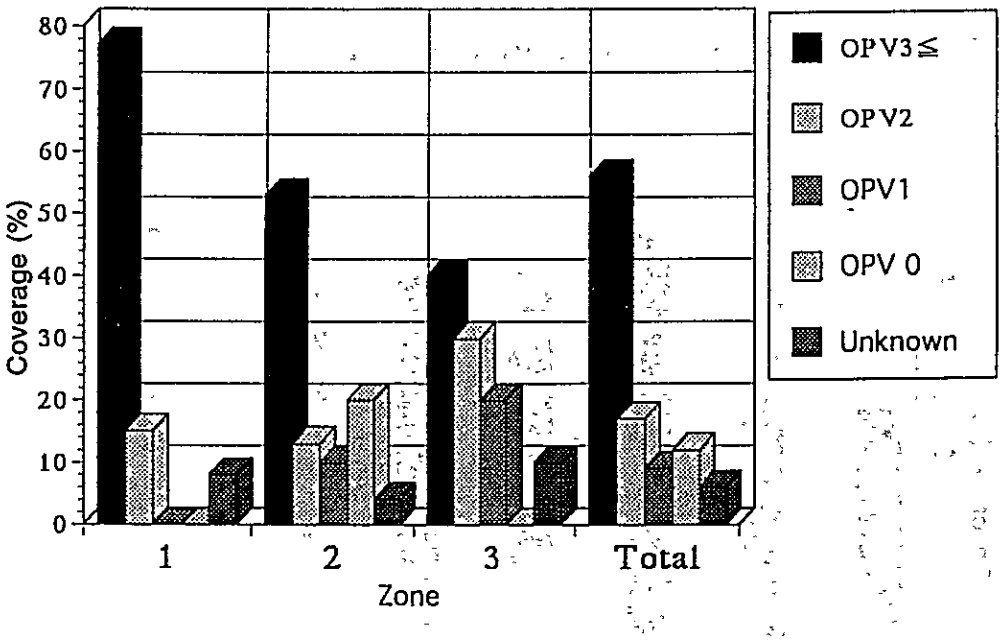


Fig. 4-4. Zone and OPV Coverage in Paksane and Khamket Districts

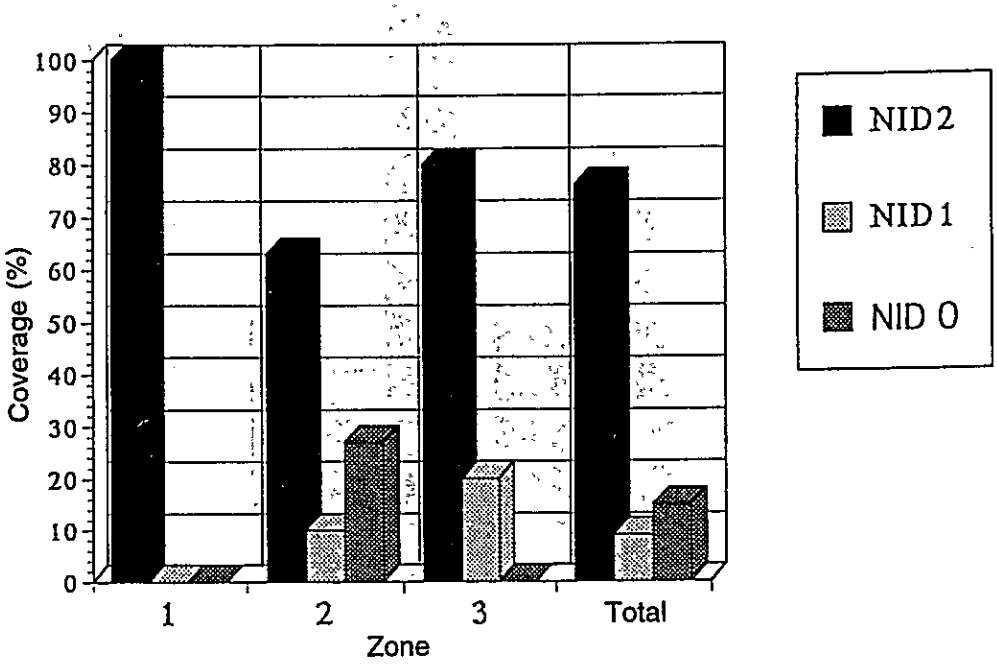


Fig. 4-5. Zone and NIDs Coverage in Paksane and Khamket Districts

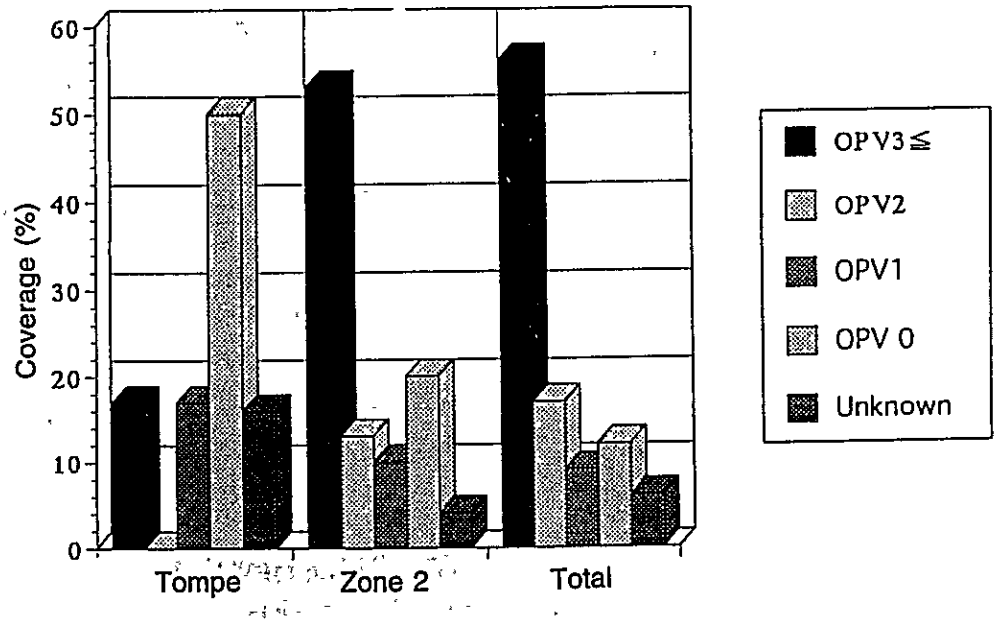


Fig. 4-6. OPV Coverage in Tompe (Lao Soung Village)

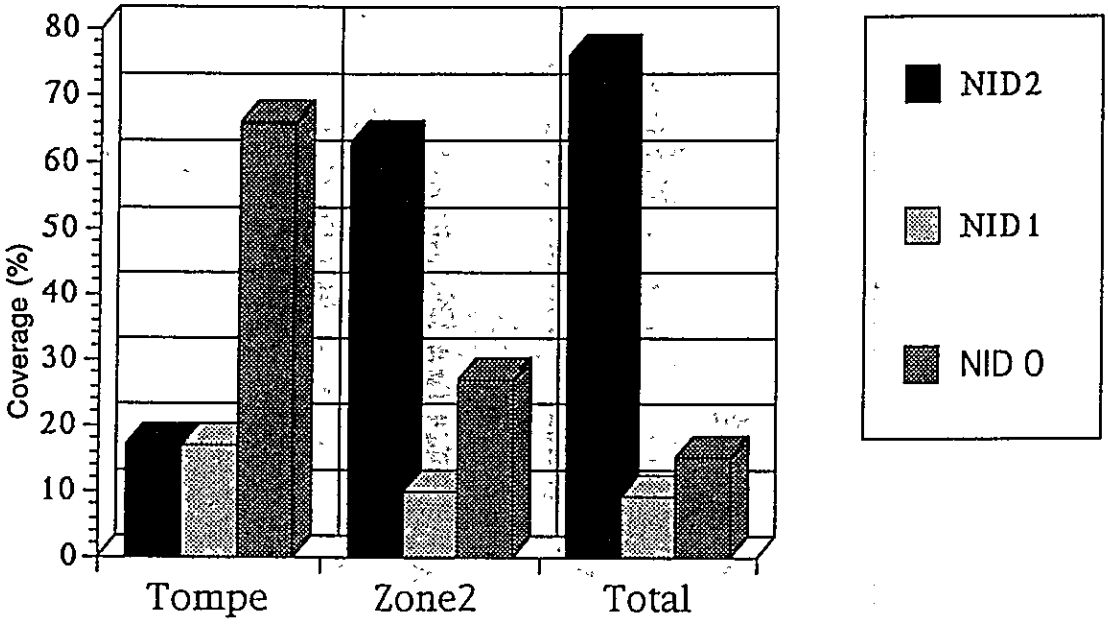


Fig. 4-7. NIDs Coverage in Tompe (Lao Soung Village)

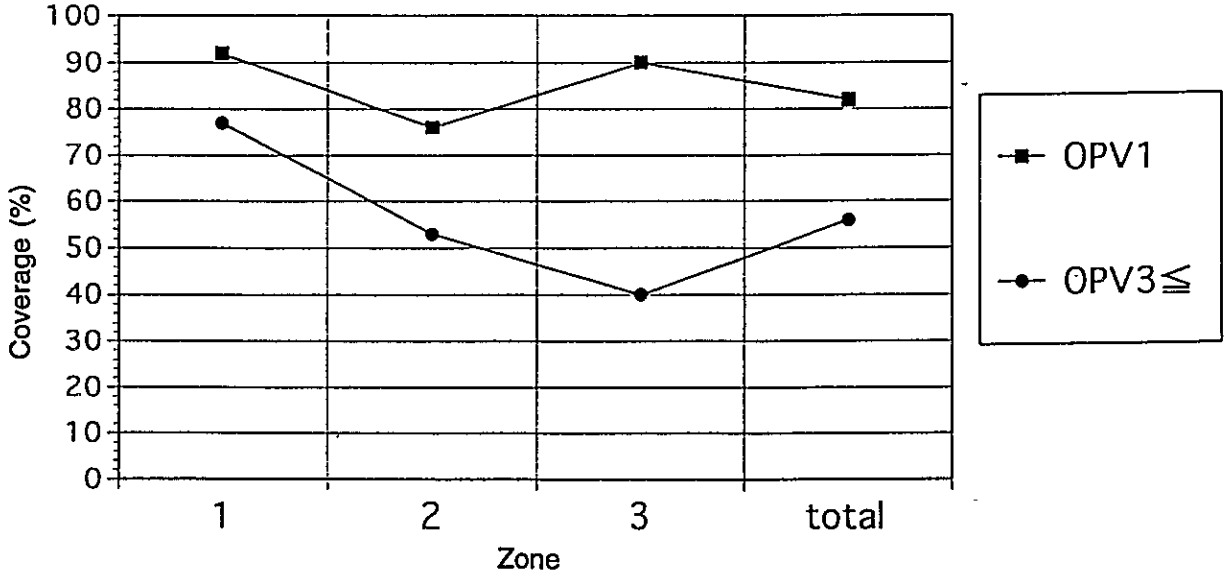


Fig. 4-8. Zone and Dropout Rate on OPV in Paksane and Khamket Districts

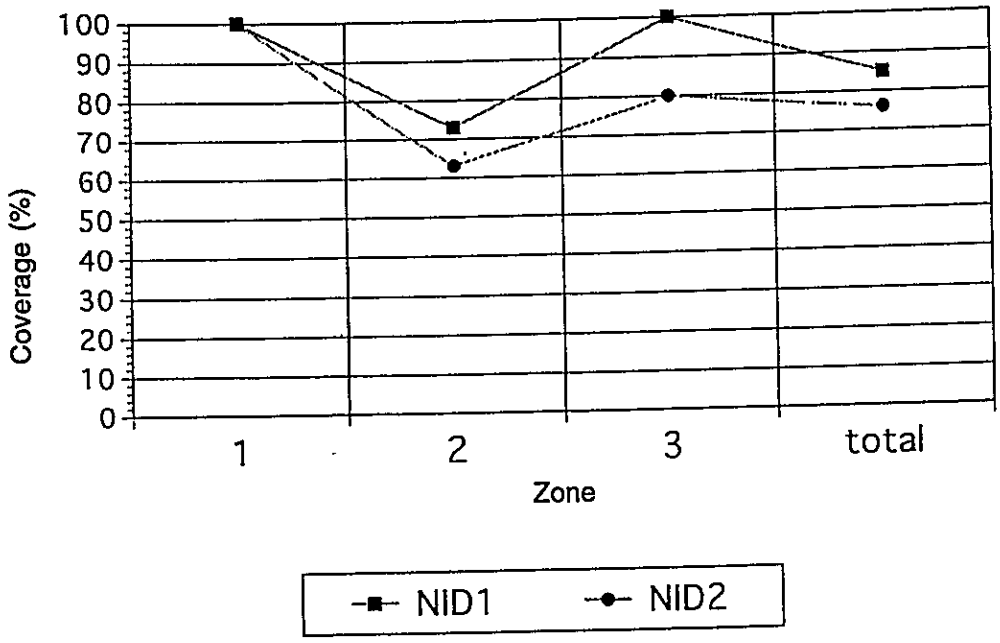


Fig. 4-9. Zone and Dropout Rate on NIDs in Paksane and Khamket Districts

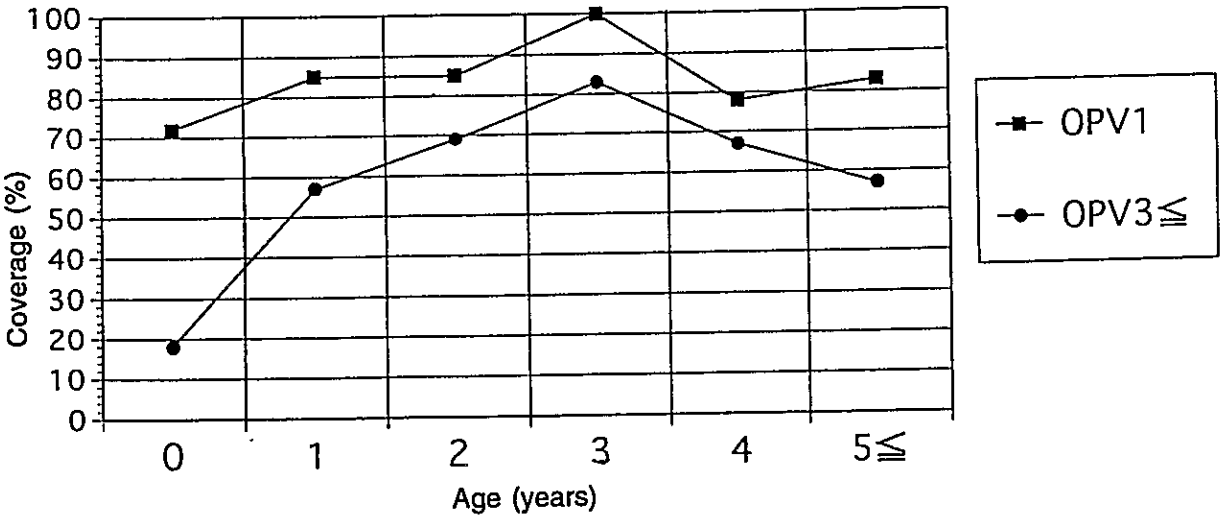


Fig. 4-10. Dropout Rate on OPV in Paksane and Khamket Districts

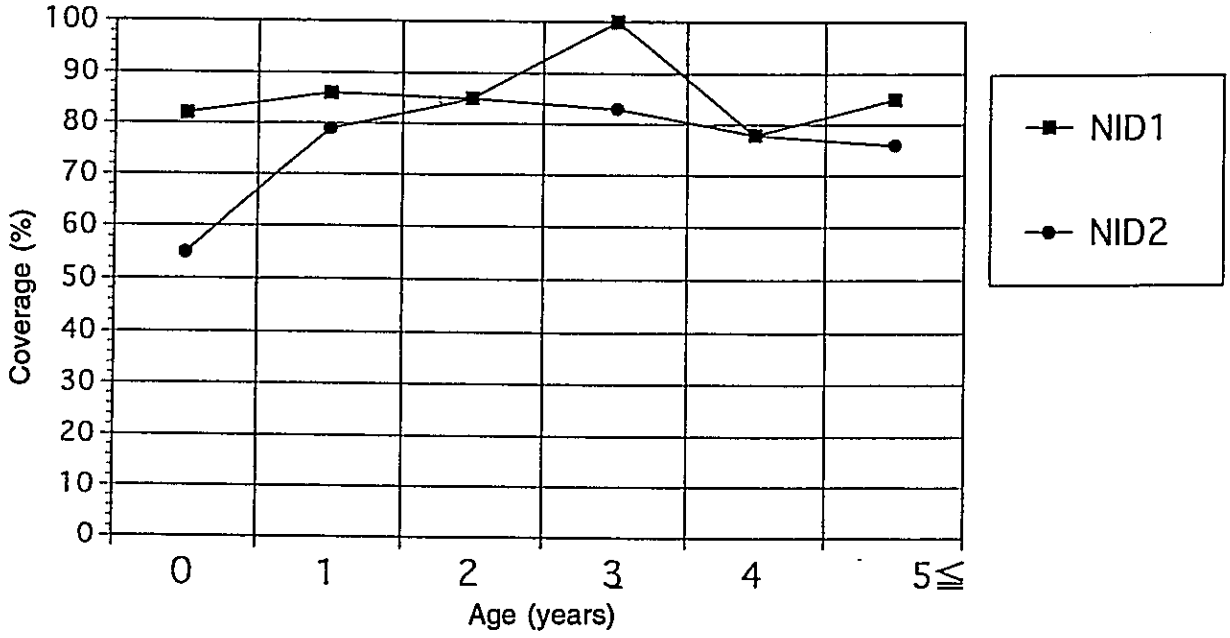


Fig. 4-11. Dropout Rate on NIDs in Paksane and Khamket Districts

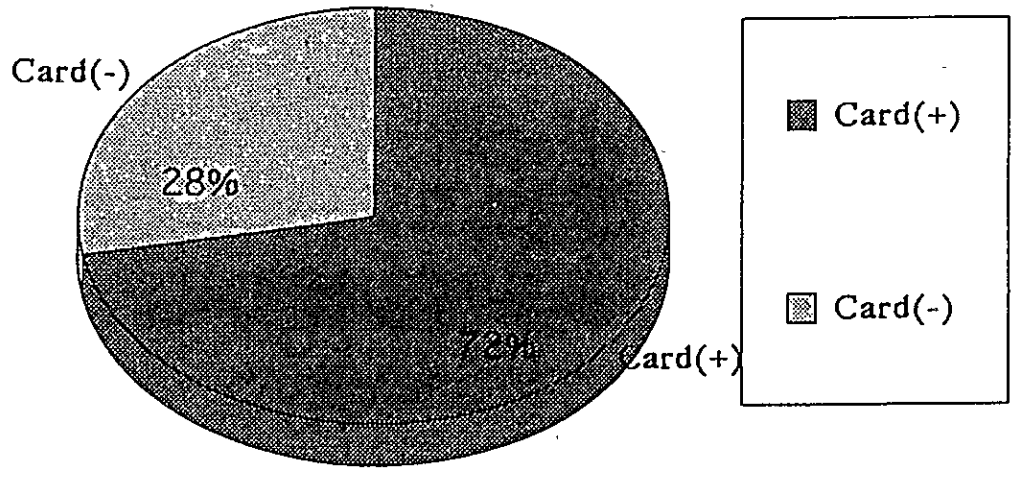


Fig. 4-12. Percentage of the Children who have Vaccination Cards

Table 4-1. The Number of Village Samples in Bolikhamxai

	Village number			Population
	Paxan	Khamket	Total	Paxan
zone 0	2	0	2	1300
zone 1	1	5	6	> 400
zone 2	1	4	6	> 300
zone 3	5	0	5	4600

* Khamket district has no map and we couldn't get any information about population.

Table 4-2. AFP Case List through Active Survey

Case	onset year	district	village	age	onset	sex	paralysis site	treatment	report	OPV
1	1983	Paxsan	Namdon	13	11M	M	LL+RL	0	0	?
2	1984	Paxsan	Viencom	13	2Y	M	LL+RL	0	0	?
3	1985	Khamke	Lac sao	10	6M	M	LL+RL	Injection	0	?
4	1986	Paxan	Viencom	12	3Y	F	RL	0	0	?
5	1988	Paxan	Ponsi	8	1Y	F	RL	Injection	0	?
6	1990	Paxan	Ponsi	10	5Y	M	RL+LL	0	0	0
7	1990	Paxan	Ponsi	7	2Y	M	RL	0	0	0
8	1992	Paxan	Namdon	6	3Y	M	LA	?	0	?
9	1992	Khamke	Teompe	3	6M	M	LL	0	0	?
10	1992	Khamke	Lacsao	3	9M	M	LL+RL	Injection	0	0
11	1992	Khamke	Kuope	3	1Y	M	RL	Injection	0	?
12	1993	Paxan	Namsan	6	4Y	M	RL	0	0	1

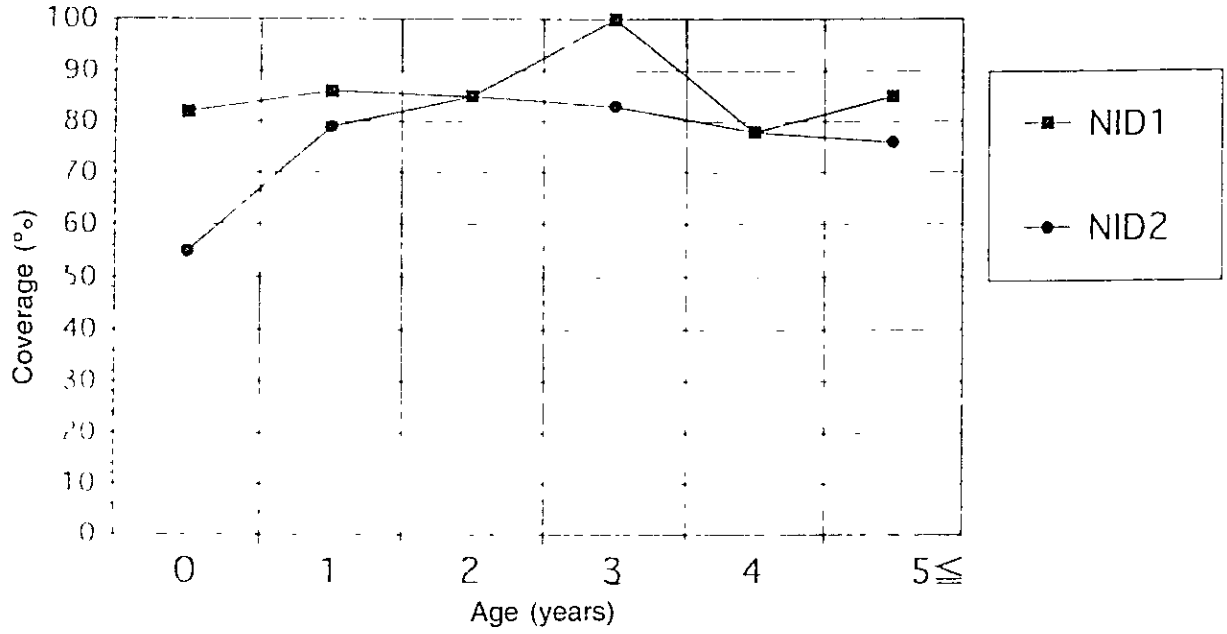


Fig. 4-11. Dropout Rate on NIDs in Paksane and Khamket Districts

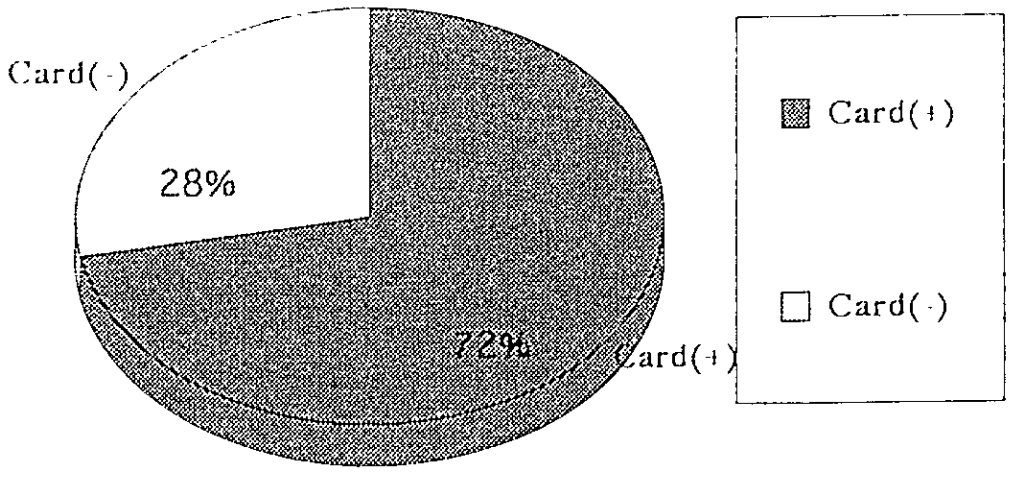


Fig. 4-12. Percentage of the Children who have Vaccination Cards

Table 4-1. The Number of Village Samples in Bolikhamxai

	Village number			Population
	Paxan	Khamket	Total	Paxan
zone 0	2	0	2	1300
zone 1	1	5	6	> 400
zone 2	1	4	6	> 300
zone 3	5	0	5	4600

* Khamket district has no map and we couldn't get any information about population.

Table 4-2. AFP Case List through Active Survey

Case	onset year	district	village	age	onset	sex	paralysis site	treatment	report	OPV
1	1983	Paxsan	Namdon	13	11M	M	LL+RL	0	0	'
2	1984	Paxsan	Viencom	13	2Y	M	LL+RL	0	0	'
3	1985	Khamke	Lac sao	10	6M	M	LL+RL	Injection	0	'
4	1986	Paxan	Viencom	12	3Y	F	RL	0	0	'
5	1988	Paxan	Ponsi	8	1Y	F	RL	Injection	0	'
6	1990	Paxan	Ponsi	10	5Y	M	RL+LL	0	0	0
7	1990	Paxan	Ponsi	7	2Y	M	RL	0	0	0
8	1992	Paxan	Namdon	6	3Y	M	LA	'	0	'
9	1992	Khamke	Teompe	3	6M	M	LL	0	0	'
10	1992	Khamke	Laesao	3	9M	M	LL+RL	Injection	0	0
11	1992	Khamke	Kuope	3	1Y	M	RL	Injection	0	'
12	1993	Paxan	Namsan	6	4Y	M	RL	0	0	1

VI. Summary

The countries of the Western Pacific Region have been making strenuous efforts to eradicate poliomyelitis toward the goal in 1995. However it may be difficult to declare the achievement of polio eradication this year in Lao PDR, because they have faced many serious problems in EPI activities such as low immunization coverage in zone 0 area, high dropout rate of routine immunization, and the existence of pocket areas. The shortage of human resources and EPI budget makes low quality of surveillance system. Low accessibility to health facilities, low social infrastructure, low population density, and ethnic diversity are obstacles to raise the coverage of routine immunization.

As WHO emphasizes, the supplementary immunization of OPV is the key strategy to eradicate poliomyelitis. The second NIDs was arranged in 1995. The coverage in Vientiane Municipality at first round was 94%. The high coverage in NIDs was brought by political commitment, intersectoral cooperation with MCH and other organization, and international and bilateral technical assistance.

Throughout our short term active search in Pakkading and Lac Sao district, we discovered 12 old polio cases that had not been reported to NIHE. Some doctors at district hospitals did not have knowledge of the AFP surveillance. According to the line list of 1994 it took 50 days to report AFP cases to NIHE. In four out of ten AFP cases stool specimens were not collected. Setting up the good surveillance system is the urgent and indispensable task not only for the eradication of the poliomyelitis but to tackle other communicable diseases towards the next century.

VII. Comment

Norio Sakurai

We visited many villages throughout our field training. On the way to rural areas, we travelled along many narrow, dirt roads by car, which enabled me to clearly understand the difficulties of outreach immunization activity. We saw ten or more children with paralysed extremities, some of them were diagnosed as old polio cases. I was very impressed by one disabled boy riding his bicycle and operating the pedals with his hands. He seemed to be proud of his skillful driving. I hope that he make a good living in the local community.

Kazuko Manabe

Three years ago, Laos' overall immunization coverage rate was 30% - the lowest in Asia. Laos has had a lot of difficulties; low GDP, lack of resources, low population density, shortage of manpower, low level of infrastructure. The many villages in zones 2 and 3 are isolated completely for as long as 6 months during the rainy season, and national roads are frequently destroyed owing to heavy rain and floods. However, the

number of poliomyelitis cases has been decreasing since 1993. In 1994, only 6 poliomyelitis cases were confirmed through the active search and the weekly reporting system. These results suggest the effectiveness of NIDs which started in 1994. NIDs are quite effective to cut the transmission of polio virus and to promote the development of infrastructure and training the personnel. Keeping high NIDs coverage is the most effective way to prevent the outbreak of poliomyelitis. As for immunization coverage, it is also necessary to get the higher coverage in zone 0 and to prevent dropout on OPV and other immunization.

The good AFP surveillance system is the other important key for polio eradication. The new national surveillance system, established in 1994, has not been working well. About 70% of provincial hygiene health offices report weekly but their reports aren't covered district level. To obtain reliable AFP surveillance system is important in Laos.

It is expected that the district EPI staff receive sufficient training in the clinical training course which is held from April in 1994.

In order to eradicate poliomyelitis in Laos by the year 2000, the continuous donation from UNICEF, WHO and Japan and Collaboration with mass organizations are necessary.

VIII. Acknowledgment

I would like to express our appreciation to all the people who contributed to our highly productive field training. - especially Dr. Somthana, Dr. Phenta, and Dr. Nypun of National Institute of Hygiene and Epidemiology: Dr. Chosa a former JICA expert, Department of International Cooperation, National Medical Center who gave us valuable data and suggestions: I would also like to give special thanks to Dr. Kuroiwa, JICA expert who planned our visit and gave us clinical training.