REPORT ON
FIELD STUDY IN INDONESIA OF
POLIO EXPERT TRAINING COURSE

March 1991

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 25th March to 20th April, 1991 in Indonesia. This field study followed the 2nd International Polio Expert Training Course held in Kumamoto in October, 1991 and four Japanese course graduates participated in the study.

As stated in WHO briefing, concerning Polio Eradication Program, Japan is requested to provide human resources. We are expected to study Indonesian system and to consider possible technology or system transfer into the countries where polio is still endemic and where we will be dispatched.

This field study was organized by the Institute for International Cooperation (JICA) in cooperation with the Indonesian government.

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

Training Secretariat of IFIC

C O N T E N T

I. SCHEDULE OF FIELD TRAINING

February	25 (Mon)	• Departure from Japan for Philippines
	26 (Tue)	• JICA Philippines Office
		• Alabang Biologicals Products
	27 (Wed)	• WPRO Briefing
	28 (Thu)	• Departure for Indonesia
March	1 (Fri)	• Department of Health, Communicable Diseases Control (CDC) Section General Information
		• JICA Indonesia Office
	2 (Sat)	• CDC Section Central Vaccine Storage etc.
	3 (Sun)	• National Training Center in Ciroto, West Jawa
	4 (Mon)	• CDC
		• NIH Research & Development Communicable Diseases Research Center
		• UNICEF
	5 (Tue)	• BKKBN Jakarta
		• Puskesmas Tebet
		• Departure for Bandung
	6 (Wed)	• Bio Farma, JICA Vaccine Project Site
		• Meeting with Bio Farma Staff
	7 (Thu)	• Bandung District Health Office
		• Puskesmas Pasirkaliki
		• Posyandu Sukaraya
		• Bio Farma, Project Site
		• Laboratory
		• Dinner on Meeting
	8 (Fri)	• Bandung to Semarang
		• BKKBN Semarang, JICA Family Planning Project Office
		• West Semarang, Kuningan Village to see PKK activity
	9 (Sat)	• Central Jawa Provincial Health Office General information
		• Provincial Health Services Cold chain
		• Laboratory of Public Health
		• Dinner on Meeting

March	10 (Sun)	· Holiday
	11 (Mon)	· Wonosobo District Health Office
		· Puskesmas Kertek
	12 (Tue)	· Puskesmas Jatinom, Klaten District
		· Posyandu Puluhan
		· Klaten District Health Office
	13 (Wed)	· Bandjarnegara District Health Office
		· Puskesmas Mandiraja
		· Posyandu Kaliwungu
		· Puskesmas Purwaredja, Klampok
	14 (Thu)	· CBR (Community Based Rehabilitation) Development & Training Center, Solo
		· YPAC (Indonesian Society for Disabled Children) Solo Center
		· Social Work Office, Solo to see the 1st meeting of disabled people
		· Orthopaedic & Prothese Prof. Dr. Soeharso Hospital
		· Lunch on Meeting
		· CBR
		· for general information
	15 (Fri)	· Provincial Health Office, CDC Section for final report
		· Dr. Kariadi, General Hospital, Pediatric Department
		· YPAC, Semarang Center
	16 (Sat)	· Report Preparation
	17 (Sun)	· Holiday
	18 (Mon)	· JICA Indonesia Office
		· Department of Health, CDC Section
		· Farewell Party
	19 (Tue)	· WHO Indonesia Office
		· Departure for Japan
	20 (Wed)	· Arrival at Narita

II. WHO/WPRO BRIEFING

On 27th February 1991, the polio expert training team visited WHO/WPRO in Manila, Philippines to be informed about regional polio eradication plan.

According to Dr. Omi (officer in charge), the guidelines on the regional plan of action are as follows;

(1) to eradicate polio by 1995 from the region
(2) to achieve 90% routine immunization coverage under one year of age
(3) to introduce national campaign strategy for the immunization under five years of age
(4) to use limited mopping-up method, in large populated country like China by identifying pocket area
(5) to use stepwise campaign or geographical expansion method for immunization in countries where infrastructure is not organized.

To reach the goal, the priority of program components are as follows;

(1) vaccine supply and cold-chain
(2) surveillance
(3) laboratory services

WHO estimates that US$100 million is necessary for the regional polio eradication program and 60% of that is for vaccine supply.

To organize regional effort for the program, WPRO Polio Task Group, which is composed with five WPRO members including Dr. Omi, is holding TAG meeting in April, 1991 in Tokyo, Japan.

Varied donor agencies and organizations will be invited, such as JICA, USAID, Rotary International, UNICEF, SIDA, World Bank, Asian Development Bank, UNDP, CDC/USA, WHO Headquarter and so on.

The following subjects will be discussed at the TAG meeting;

(1) adoption of regional plan of action
(2) assurance of fund and technical support
(3) coordination of donors

(4) constitution of regional polio technical advisory committee

Japan will be requested to be a major donor of human resources. (Concerning vaccine, Japan has no capacity to supply polio vaccine to the problem countries)

At present, WPRO is expecting that Japan can dispatch following experts;

(1) One or two short-term consultants for epidemiological survey in problem countries
(2) WPRO medical officer
(3) JICA expert to China, Philippers and Laos.

Further will be discussed at TAG meeting.

III. FIELD STUDY IN INDONESIA

(1) BACKGROUND INFORMATION

GEOGRAPHY

The Republic of Indonesia is the largest archipelago in the world. It's geographical location is at a cross roads between the world's biggest oceans, the Pacific and the Indian Ocean, Asia, and Australia continents.

The islands have a land area of 1,905,443 sq kms and its 13,667 islands stretch 5,120 kms from east to west and 1.760 kms from north to south. The six main islands of Indonesia are Sumatra, Java, Kalimantan, Sulawesi and Irian Jaya. Indonesia's horizontal geographical spread is greater than that of U.S.A. Total number of population in 1990 is estimated at 180 million people. Java is the principle island in terms of population, land use, and site of Jakarta, the capital of the Republic of Indonesia. It is almost the most densely populated island and 63% of the population live on Java. In Indonesia, population of 20% live in urban areas and 80% live in rural areas.

The islands of Indonesia lie along the equator, its climate is tropical with high humidit, and has only slight changes in temperature and heavy rainfall. Temperatures generally range from 20 to 30 degrees Celcius. Humidity is 60% to 90%.

ADMINISTRATION

Indonesia divided into 27 provinces for administration by the Central Government. Sumatra has eight provinces. District of Aceh, North Sumatra, West Sumatra, Riau, Jambi, Bengkulu, South Sumatra and Lampung. Java is divided into five provinces: Jakarta Raya, West Java, Central Java Yogyakarta and East Java. Kalimantan is divided into only four provinces due to its small populations: West Kalimantan, Central Kalimantan, East Kalimantan and South Kalimantan, while Sulawesi's four provinces comprise North Sulawesi, Central Sulawesi, Southeast Sulawesi and South Sulawesi. Other provinces are bali, West Nusa Tenggara, East Nusa Tenggara, East Timor, Maluku and Irian Jaya. Each province is administered by a governor

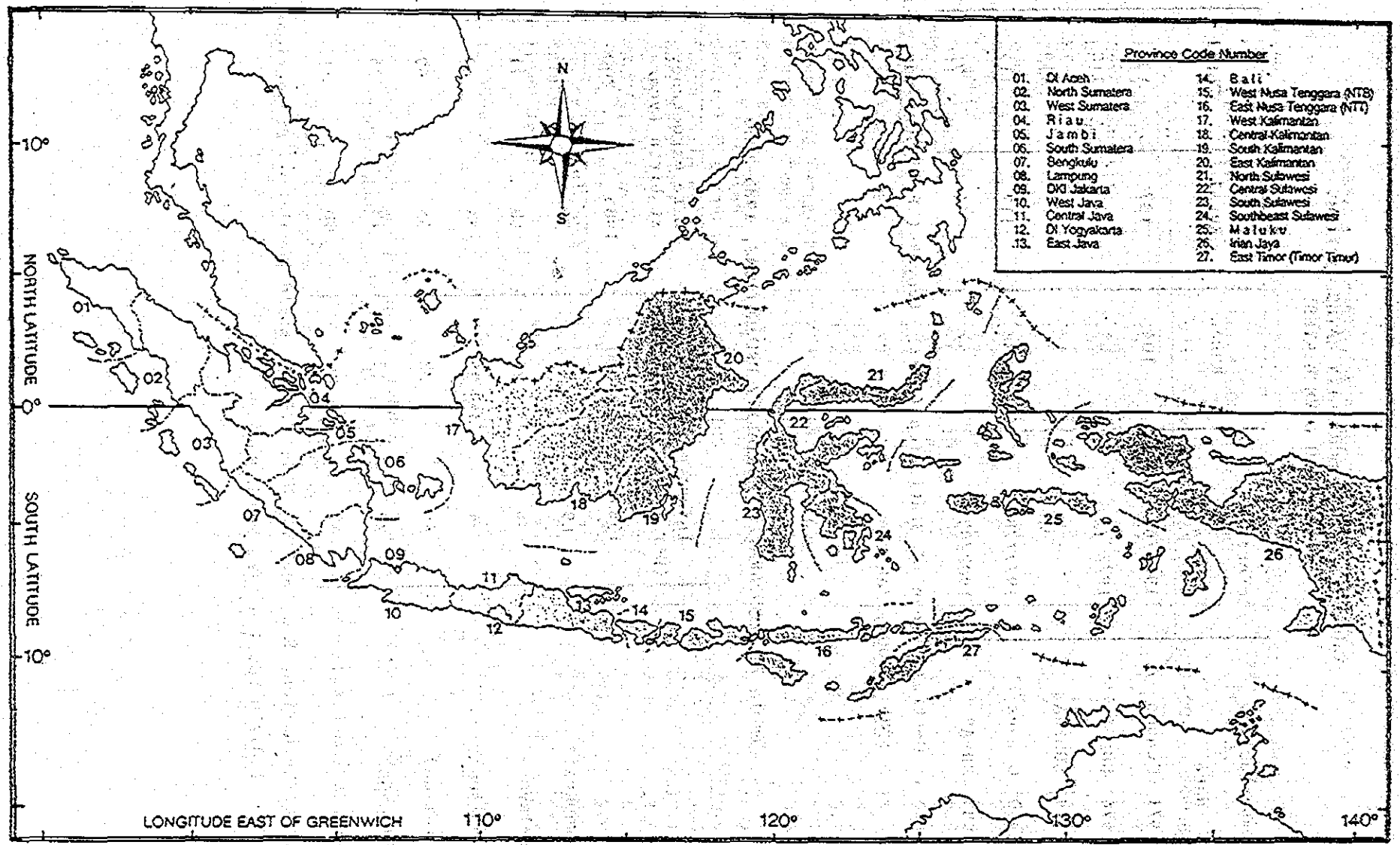
appointed by the Central Government (as shown in map).

RELIGION

The majority of people, 94% are Moslem, the rest are Catholics, Protestants, Hindu and Buddhist.

HEALTH CARE (Infant Mortality and Morbidity)

The infant mortality rate has been roughly halved from around 132 per 1,000 live births in the late 1960s to about 71 in the early 1980s. (See Table 1, 2, 3, 4, 5 and Fig. 1)


Province Code Number
01. Di Aceh
02. North Sumatera
03. West Sumatera
04. Riau
05. Jambi
06. South Sumatera
07. Bengkulu
08. Lampung
09. DKI Jakarta
10. West Java
11. Central Java
12. Di Yogyakarta
13. East Java
14. Bali
15. West Nusa Tenggara (NTB)
16. East Nusa Tenggara (NTT)
17. West Kalimantan
18. Central Kalimantan
19. South Kalimantan
20. East Kalimantan
21. North Sulawesi
22. Central Sulawesi
23. South Sulawesi
24. Southeast Sulawesi
25. Maluku
26. Irian Jaya
27. East Timor (Timor Timur)
N
S
10°
NORTH LATITUDE
0°
SOUTH LATITUDE
10°
LONGITUDE EAST OF GREENWICH
110°
120°
130°
140°

INDONESIA

Table 1 INFANT MORTALITY RATES, 1971-85
(PER 1,000 LIVE BIRTHS)

Census/survey date	Referance date	Ruban	Rural	Total
1971 Census	1968/69	104	137	132
1976 SUPAS	1972/73	95	113	110
1979 SUSENAS	-	93	121	114
1980 Census	1977/78	88	112	112
1985 SUPAS	1982/83	57	74	71

Source : Central Bureau of Statistics (1987), Proyeksi Penduduk Indonesia 1985 - 2005, Jakarta

Table 2 COMPARATIVE MORTALITY PROJECTIONS, 1985-2000

	Infant mortality (per 1,000 live births)		Life expectancy at birth (years)	
	1985	2000	1985	2000
Indonesia	89	57	56	63
Malaysia	36	25	68	71
Philippines	54	35	64	69
Thailand	49	32	65	69
Singapore	20	15	73	75
East & South Asia	45	30	68	71

Source: Zachariah, K.C. and Vu, M.T. (1988), World Population Projections; 1987/88 Edition, The World Bank.

Table 3 INFANT MORTALITY RATES BY PROVINCE, 1971-85

Province	Per 1,000 live births			Average Rate of Decline (% P.A.) /a	
	1971	1980	1985	1971-80	1980-85
D.I. Aceh	141	91	47	4.8	13.2
North Sumatra	120	89	64	3.2	6.6
West Sumatra	151	121	76	2.4	9.3
Riau	141	113	55	2.4	14.4
Jambi	155	116	60	2.9	13.5
South Sumatra	151	118	71	4.8	10.2
Bengkulu	166	106	62	5.0	10.7
Lampung	147	97	59	4.5	9.9
DKI Jakarta	126	80	36	4.9	16.0
West Java	165	129	89	2.7	7.4
Central Java	143	96	65	4.4	7.8
D.I. Yogyakarta	98	62	29	5.1	15.2
East Java	119	99	74	2.0	5.8
Bali	127	88	58	4.0	8.3
West Nusa Tenggara	219	187	145	1.7	5.1
East Nusa Tenggara	151	124	74	2.2	10.3
East Timor	-	-	69	-	-
West Kalimantan	143	116	57	2.3	14.2
Central Kalimantan	128	100	58	2.7	10.9
South Kalimantan	165	121	83	3.3	7.5
East Kalimantan	151	99	40	0.7	18.1
North Sulawesi	114	94	50	2.1	12.6
Central Sulawesi	146	128	94	1.4	6.2
South Sulawesi	159	108	69	4.2	9.0
Southeast Sulawesi	191	114	73	5.6	8.9
Maluku	145	124	68	1.7	12.0
Irian Jaya	113	106	38	0.8	20.5
Indonesia	143	107	70	3.2	8.5

/a Reference periods are: 1968-69 for the 1971 census, 1977-78 for the 1980 census and 1982-83 for SUPAS 1985.

Source: Central Bureau of Statistics

Table 4 INFANTILE MOBILITY AND MORBIDITY

Year	1980			1985		
Age	1M<	1-11M	Total	1M<	1-11M	Total
Diarrhea	3.49	19.40	22.89	0.63	10.57	11.20
A.R.I.	4.27	18.23	22.50	0.63	9.43	10.06
Tetanus	17.07	2.72	19.79	10.94	2.89	13.83
Congenital anomary	8.92	-	-	11.70	1.29	12.99
Etiology unknown	0.78	4.27	5.05	0.63	2.64	3.27
Malnutrition	-	0.39	0.39	-	0.76	0.76
Another infectious disease	0.78	3.10	3.88	0.13	2.01	2.14
Abnormal delivery	0.78	0.78	1.56	1.76	1.26	3.02
Trauma	0.78	0.78	1.56	0.63	1.13	1.76
Diphtheria	-	1.16	1.16	0.38	5.78	6.16
Others	1.94	2.72	4.66	0.25	1.76	2.01
Total	39.59	59.15	89.82	27.68	43.54	71.22

Year	'70	'71	'72	'73	'74	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85	'86	'87	'88	'89	'90
Indonesia*	61	45	63	23	66	75	45	114	87	133	205	104	170	95	85	47	21	20	21	16	7(Jan-Sep)
Central Java**								9	3	-	3	5	-	25	11	16	8	2	0	0	0
West Java***																					26****

EPI began (BCG,DPT,TT,V)

OPV began

Measles V. began

New integrated family health planning was issued by President Soeharto

EPI expanded movement

* sourse: YCAP (The society for the care of disable children

** sourse: CDC in Semarang

*** sourse: CDC in Bandung

****Keb Dcrang(8) Keb Karawang(10) Keb Bandung(1)
Keb Garet(2) Keb Tujik(2) Keb Majalengka(1)
Keb Indramayu(2)

Fig. 1 REPORTED POLIOMYELITIS PATIENTS

Table 5 MAIN DISEASE OF URBAN AREAS AND RURAL AREAS (1987)

Area	Urban Areas (20%)		Rural Areas (80%)		Total
Sex	Male	Female	Male	Female	
Tuberculosis (%)	75,028 (12.6)	70,415 (11.8)	259,478 (43.4)	192,611 (32.2)	597,532 (100)
G-I tract disease (%)	102,311 (12.1)	105,704 (12.5)	343,263 (40.5)	295,891 (34.9)	847,169 (100)
Malaria (%)	192,002 (9.0)	161,788 (7.6)	917,543 (42.4)	870,516 (40.6)	2,141,960 (100)
Measles (%)	278,379 (12.8)	274,699 (12.6)	815,226 (37.4)	808,606 (37.1)	2,176,910 (100)
Disease of int medicine (%)	333,246 (13.1)	333,439 (13.1)	955,269 (37.5)	927,864 (36.4)	2,549,818 (100)
Others (%)	1,820,066 (12.8)	1,710,427 (12.0)	4,834,906 (33.9)	5,894,635 (41.3)	14,260,034 (100)
Total (%)	2,801,032 (12.4)	2,656,472 (11.8)	8,125,796 (36.0)	8,990,123 (39.8)	22,573,423 (100)

(2) STRATEGY AND SYSTEM

Interventions to improve health are important policy instrument in the Government's overall strategy to reduce poverty and improve the welfare of the Indonesian people.

Three main factors justify this policy concern with the health sector. First, relief from the burden of illness and premature death satisfies directly a basic consumption need which is an important social policy goal in itself. Second, improvements in health constitute an investment in human capital formation leading to future yields in increased productivity among the poor. And third, reduction in infant and child mortality also contribute indirectly to reducing poverty by helping to reduce high fertility rates; to reduce mortality not only help parents to achieve their desired smaller family size with fewer births.

EPI program also involves this policy in Indonesia. In 1986, President Soeharto issued a public statement for Integrated Family Health Program. And also he gave himself polio vaccine for an infant. We can show this billboard everywhere in this country.

o National Plan of Action

Indonesia developed the national plan of action for polio eradication led from global polio eradication strategy. (See Fig. 17-1)

This booklet is used for training.

o National Governmental Body

Fig. 2 and Fig. 19 show the structure of Ministry of Health and the health system in Indonesia.

Table 6 to 11 show statistics of health facilities.

o POSYANDU (Integrated Health Services Post)

There are 82,688 spots (1986) and about 220,000 members (1990) in Indonesia. This is the center of informations and activities for immunization, maternal and child health, nutrition, diarrhea disease control and Family Planning in village level.

o PKK (Village Volunteer Woman Organization)

This is the main group to enhance community awareness and knowledge in EPI through the organizing of public - information, motivation and educational-campaign. National-wide POSYANDU project has been supported by PKK, local government and village development councils.

o Another Community Member

Karang Taruna (Youth organization)

LKMD/LMD (Village council)

Traditional Birth Attendants

YPAC (The society for the care of disabled children)

o Media

TV spot/every morning

Radio spots/every morning

Newspaper

Leaflet

Billboard

Poster

Speech

Discussion

Traditional show (Wayang etc.)

Entertainment show

Fig. 2 MINISTRY OF HEALTH, INDONESIA

(Presidential Decree No.15/1984, 6 March 1984)

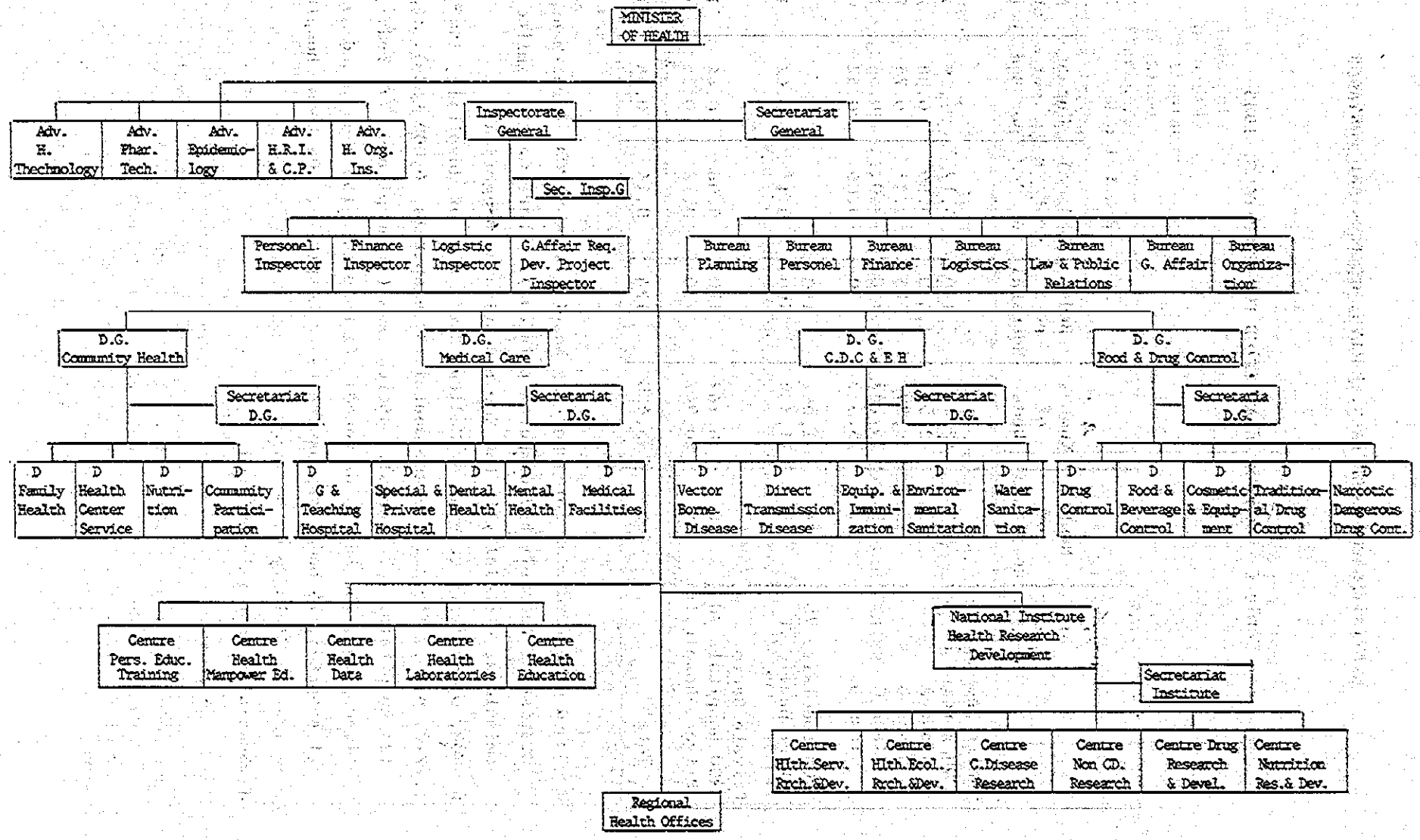


Table 6 SUMMARY STATISTICS FOR HOSPITALS, 1985

	Number of Hospitals	Number of Beds	Ratios			
			Beds per Hospital	Medical doctors per Bed	Nurses per per Bed	All staff per Bed
Public Sector						
MOH general	313	43,140	140	0.17	1.59	1.37
Class A	2	2,918	1,450	0.59	0.88	2.85
Class B	15	9,396	625	0.37	0.75	2.11
Class C	79	25,247	190	0.07	0.51	1.04
Class D	217	15,579	70	0.06	0.52	0.96
MOH specialty /b	74	11,062	150	-	-	-
Other public /c	115	11,539	100	0.1	0.62	1.23
Private Sector						
NGO hospitals /d	80	8,762	110	0.06	0.44	1.07
Private hospitals	175	20,947	120	0.12	0.53	1.49
Total	683	95,450	124	0.14	0.56	1.35

/a Based on information for reporting hospitals from MOH, Department of Statistics (unpublished computer printout). There may be limited omissions, especially in the NGO and private categories.

/b MOH, Directorate General of Medical Care, List of Hospitals, 1982, Table 2.3, p.30. These includes: mental (33 hospitals, 6,000 beds), leprosy (25 hospitals, 3,724 beds), tuberculosis (11 hospitals, 772 beds), eyes (1 hospital, 236 beds), orthopedic (1 hospital, 150 beds), and quarantine (1 hospital, 76 beds) and maternity (2 hospitals, 104 beds) hospitals.

/c Primarily Ministry of Defense.

/d Specialty hospitals omitted.

Table 7 COMPARATIVE HOSPITAL BED RATIOS

	Beds per '000
Indonesia	0.6
Malaysia	2.5
Philippines	2.0
Thailand	1.4
Singapore	5.0
Low income	0.9
Lower middle income	1.3
Upper middle income	2.5
Industrial market economies	10.0

Source: Social Indicators of Development 1987, Socioeconomic Data Division, International Economics Department, The World Bank.

Table 8 HEALTH PERSONNEL AT HOSPITALS AND HEALTH CENTER, 1985

	Number of Facilities	Number Reporting	Number of Employees			
			Medics	Para-medics	Others	Total
MOH Facilities						
Health Center	5,014	5,014	5,745	496,964	20,768	73,477
Hospitals	425	415	8,354	36,822	27,901	73,077
Class A	2	2	1,712	3,012	3,589	8,313
Class B	15	15	3,474	8,048	8,340	19,862
Class C	79	79	1,133	8,696	5,977	15,808
Class D	216	216	915	8,977	5,124	15,016
Special	113	103	1,118	8,089	4,871	14,078
Total			14,099	83,739	48,669	145,554
Other Government & Quasigovt Hospitals	80	79	552	4,508	4,273	9,333
Private Hospitals	175	171	2,510	12,201	16,423	31,134
For comparison Total DEPKES-Appointed Employees:			14,706	84,401	53,741	152,848

Note: Employee counts as reported by health centers and hospitals are supposed to be comprehensive, i.e., include all employees regardless of employee's departmental classification.

Sources: Hospital data: MOH, Yan Med, Information Section, "Performance Estimation of Central Hospital, Indonesia 1985", Health Center data: MOH, Binkesmas, "Cambaran Tenaga Pada Uskesmas Menurut Propinsi di Indonesia Tahun 1985". Total MOH-appointed employees: DepKes, Data Center, BAKN masterfile, January, 1986.

Table 9 COMPARATIVE HEALTH EXPENDITURE RATIOS

	Year	As % of central government expenditure	As % of GDP	US$ per capita
Indonesia	1985	2.56	0.56	3.37
Malaysia	1981	4.39	1.36	23.40
Philippines	1985	5.95	0.63	3.75
Thailand	1985	5.69	1.20	8.98
Singapore	1985	6.47	1.78	122.29

Source: International Monetary Fund, Government Finance Statistics Yearbook: 1987 and World Bank staff estimates.

Table 10 RATIOS OF PUSKESMAS TO POPULATION BY PROVINCE, 1986

Province	1985 Population 000s	3/86 Reported PUSKESMAS	Ratio PUSKESMAS Population	Implied Number 1:30,000
DKI Jakarta	7,829	280	1:27,961	261
Jawa Barat	30,733	615	1:49,972	1,024
Jawa Tengah	26,934	606	1:44,446	898
DI Yogyakarta	2,967	101	1:29,376	99
Jawa Timur	31,039	817	1:37,991	1,035
DI Aceh	2,981	146	1:20,418	99
Sumatera Utara	9,444	285	1:33,137	315
Sumatera Barat	3,666	141	1:26,000	122
Riau	2,514	92	1:27,326	84
Jambi	1,728	76	1:22,737	58
Sumatera Selatan	5,411	167	1:32,401	180
Bengkulu	936	79	1:11,848	31
Lampung	5,987	126	1:47,515	200
Kalimantan Barat	2,815	137	1:20,547	94
Kalimantan Tengah	1,140	92	1:12,391	38
Kalimantan Selatan	2,289	124	1:18,460	76
Kalimantan Timur	1,538	109	1:14,110	51
Sulawesi Utara	2,375	114	1:20,833	79
Sulawesi Tengah	1,539	72	1:21,375	51
Sulawesi Selatan	6,600	222	1:29,730	220
Sulawesi Tenggara	1,083	69	1:15,696	36
Bali	2,638	83	1:31,783	88
Nusa Tenggara Barat	3,047	88	1:34,625	102
Nusa Tenggara Timur	3,029	133	1:22,774	101
Maluku	1,633	100	1:16,330	54
Irian Jaya	1,357	125	1:10,856	45
Timor Timur	624	61	1:10,230	21
Total	163,876	5,060		5,462

Document of the World Bank

Table 11 PROPORTION OF PUSKESMAS WITH DOCTORS BY PROVINCE, 1985

Province	Number of Puskesmas	Percent with Doctor Present
Aceh	146	65.1
N. Sumatra	285	80.4
W. Sumatra	139	94.2
Riau	91	96.7
Jambi	74	89.2
S. Sumatra	165	92.1
Bengkulu	69	97.1
Lampung	123	97.6
Jakarta	278	95.3
W. Java	603	85.4
Yogyakarta	100	97.0
C. Java	602	95.2
E. Java	818	86.2
W. Kalimantan	137	73.0
C. Kalimantan	92	59.8
S. Kalimantan	124	70.2
E. Kalimantan	108	63.0
N. Sulawesi	114	90.4
C. Sulawesi	72	80.6
S. Sulawesi	222	73.4
SE. Sulawesi	68	58.8
Bali	83	98.8
W. Nusa Tengg	87	93.1
E. Nusa Tengg	131	53.4
Maluku	99	57.6
Irian Jaya	124	30.6
E. Timor	61	60.7
Total	5,015	82.6 (Weighted Average)

Source: MOH, Planning Bureau

(3) IMMUNIZATION COVERAGE

1) Current Status

OPV was introduced in 1980-1981. Over this decade, the coverage rate has been increasing steadily (Fig. 3, Table 12). The overall rate in 1989/1990 fiscal year was 77.1%, including seven remote or island provinces with the rate under 65%. More than 90% of eligible children are likely to receive OPV3 in 1990 (Table 13). The (sub)districts where we visited always had graphic displays of the coverage rate of OPV3 by 90%. Jakarta Post, an Indonesian newspaper, reported in March, 1991 that Jakarta city got award for immunization success, including 98.5% polio immunization, higher than the target which set as 85% (Fig. 22). These were just like a contest among them.

The coverage by month in West Java Province (Fig. 4) shows particularly interesting data pointing the low coverage in April or May, the period of Moslem fasting, Ramadan. But, the coverage has increased even in that period, since vaccination is prior to religion. The dropout rate for those receiving OPV1 and DRT1, but not OPV3, has been decreasing from 47% in 1985 to 10% in 1989. Fig. 5 illustrates the dropout rate of each province, including remote ones with the higher rate but less than 30%. The reasons for this dropout are difficulty of access, fear of vaccination, insufficient follow-up as well as sickness or fasting at the vaccination time. Missed opportunity is considered to be happen among hundreds and thousands of unidentified tramp people in the urban area such as Jakarta.

2) Immunization Schedule

The routine immunization of OPV has been included in the regular EPI by WHO recommendations. The schedule is as follows:

OPV is given to an infant in the age ranging from one or two month to 11 months three times with interval of more than four weeks. The contraindication for OPV ought to be none, but some doctors comment that the children with high fever are refused to immunize. The actual vaccination usually begins at two or three months of age, when infants have the first contact with health service. At the same time, the mothers received the child-health care card including column for immunization records (Fig. 12-1 to 3).

3) Immunization Session

The puskesmas or health centers are responsible for immunization activity. And the hospital and private practitioners provide the services without available information.

Integrated family posts (posyandu), operated by the puskesmas, implement the actual outreach immunization session. Over 80% of children are vaccinated by trained full-time staff in their villages through the posyandu on a routine schedule ranging from once a month to every three month.

4) Registration of Immunization and Target Population

Posyandu or villages register the immunization records, sum up the data monthly and report to puskesmas. The reported data are sent not only to district or provincial offices, but also directly to the central office. On the other hand, the registrations of newborns, usually born in their home are made by PKK in the villages and afterward reported to puskesmas. Some puskesmas have no correct data on the total number of newborns in their areas. That is why target population denominators are sometimes underestimated or untrue. The coverage rates are subsequently overestimated or fluctuating, sometimes beyond 100% as shown in Table 13. The coverage rate should be expressed as a percent of the newborns.

5) Local Area Monitoring (LAM)

The recent improvement of the coverage in Indonesia is attributable to local area monitoring (LAM) of immunization, which has been developed since 1984. This monitoring is used as a method to evaluate coverage and dropout at all levels. The organization of LAM, as shown in Fig. 7, consists of feedback and monthly analysis of the data. The principle of LAM is shown on Fig. 8. It makes use of decision tree for evaluating immunization coverage by target (Fig. 14). Check list of immunization program (Fig. 15-1 to 3) is also applicated as supervision for LAM every three month. LAM identifies the level of the achievements as well as the problems, determines the priority areas and selects the appropriate interventions. This has actually made advance on immunizations.

The impact of LAM entailed the increasing coverages (Fig. 10). Fig. 10 also illustrates the effect of LAM, comparing the areas where conduct LAM to the others.

Fig. 3 Polio Vaccine Coverage over the Decade

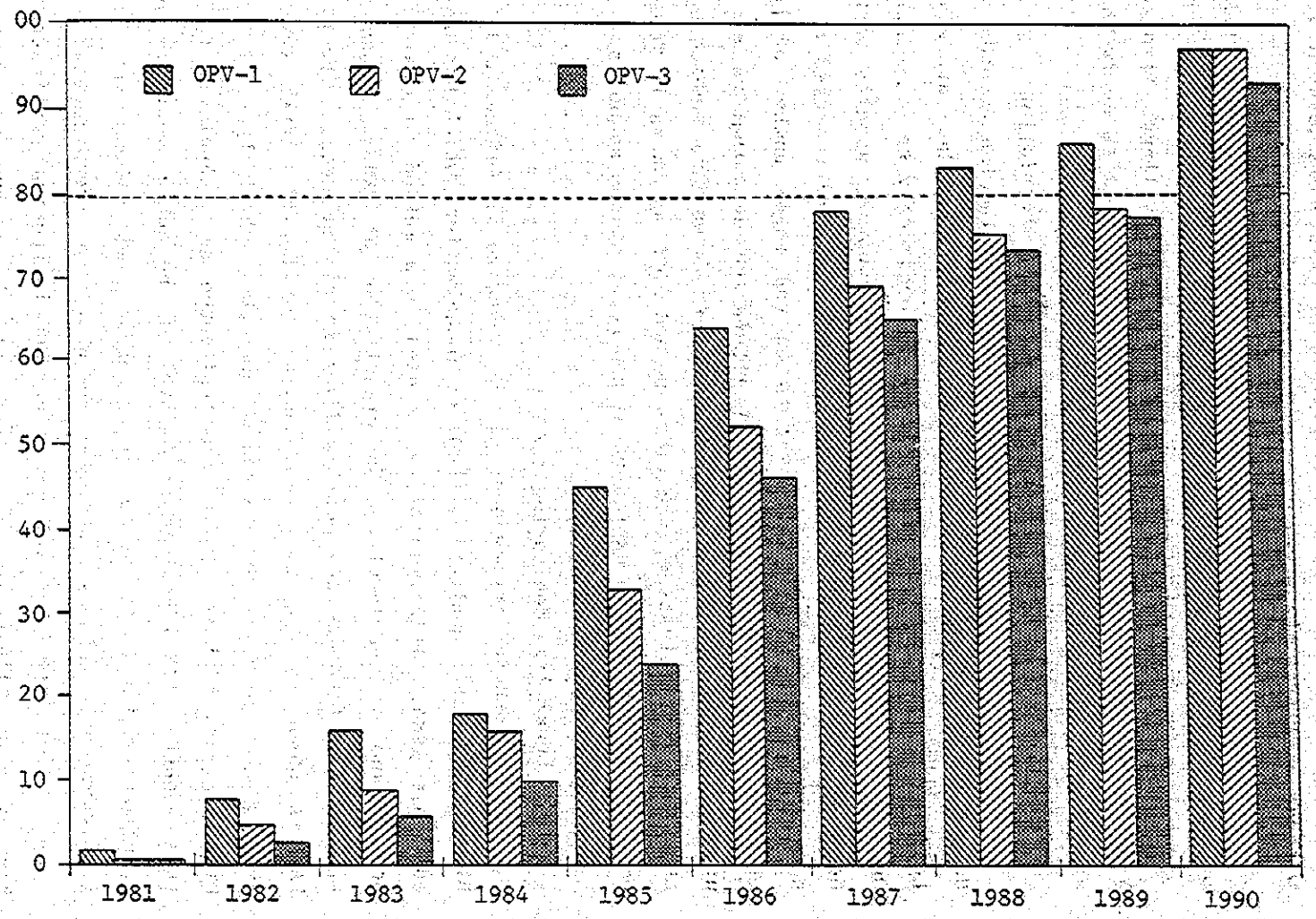


Table 12 PERCENTAGE POLIO-3 VACCINATION COVERAGE BY PROVINCE FROM 1983/81 to 1987/88

No.	Province	1983/84	1984/85	1985/86	1986/87	1987/88
01	D.I. Aceh	0.3	9.6	19.3	29.0	66.7
02	Sum. Utara	3.1	4.7	11.0	36.6	61.9
03	Su. Barat	10.5	21.0	27.9	40.6	79.2
04	Riau	6.8	12.7	24.5	40.8	63.0
05	Jambi	2.5	3.7	6.9	57.9	73.2
06	Sum. Selatan	5.8	12.2	16.1	36.7	51.7
07	Bangkulu	11.4	15.8	41.7	70.1	70.7
08	Lampung	2.8	5.0	12.4	43.1	60.7
09	DKJ Jakarta	18.5	20.6	35.1	44.5	58.7
10	Jawa Barat	2.6	6.5	15.0	45.1	79.4
11	Jawa Tengah	5.2	12.5	36.3	62.3	73.2
12	D.I.Y.	19.6	19.9	46.4	53.2	80.5
13	Jawa Timur	6.7	17.1	39.7	46.9	57.3
14	Kal. Barat	2.8	5.6	9.2	20.8	52.2
15	Kal. Tengah	5.7	14.1	23.2	29.8	53.2
16	Kal. Selatan	2.0	3.9	16.4	31.5	49.8
17	Kal. Timur	5.5	11.8	20.3	26.7	41.7
18	Sul. Utara	7.2	11.1	26.3	39.6	83.4
19	Sul. Tengah	1.3	1.8	5.9	20.7	49.1
20	Sul. Selatan	3.6	7.8	16.4	34.9	58.0
21	Sul. Tenggara	2.7	3.8	5.2	33.4	48.1
22	Bali	23.9	33.6	57.7	58.0	69.0
23	N.T.B.	3.2	4.7	9.2	35.8	54.2
24	N.T.T.	0.9	2.2	2.7	27.3	41.4
25	Maluku	4.2	8.6	7.0	13.9	31.2
26	Irian Jaya	15.3	9.5	11.2	25.2	44.0
27	Timor Timur	2.1	8.0	15.1	22.5	31.4
	Total	5.8	11.5	24.1	44.2	64.6

Table 13 IMMUNIZATION COVERAGE AMONG INFANTS, INDONESIA
January – December 1990

No.	Province	WHO Target Infants	BCG	%	DPT1	%	DPT3	%	Polio 3	%	Measles	%
1	D.I. Aceh	96,365	94,625	98.2	104,481	108.4	84,509	87.7	89,505	92.9	84,205	87.4
2	North Sumatera	310,479	331,922	106.9	360,370	116.1	309,667	99.7	330,133	106.3	322,313	104.8
3	West Sumatera	101,333	107,465	106.1	106,321	104.9	94,197	93.0	65,831	94.6	87,779	86.6
4	Riau	83,559	93,081	111.4	90,491	108.3	79,730	95.4	81,634	97.7	80,538	96.4
5	Jambi	59,737	72,388	121.2	72,325	121.1	73,048	122.3	73,286	122.7	72,124	120.7
6	South Sumatera	178,262	196,534	110.3	199,613	112.0	172,347	96.7	179,332	100.6	159,746	89.6
7	Bengkulu	32,966	32,204	97.7	35,803	108.6	29,473	89.4	31,674	96.1	30,289	91.9
8	Lampung	216,599	234,620	106.3	248,146	114.6	225,744	104.2	231,519	106.9	218,550	100.9
9	DKI Jakarta	218,599	261,116	119.5	266,213	121.8	345,348	107.7	239,121	109.4	202,409	92.6
10	West Java	868,438	983,443	113.2	994,207	114.5	900,213	103.7	940,666	108.3	890,988	102.6
11	Central Java	663,859	608,086	91.6	720,315	108.5	567,106	85.4	665,817	100.3	643,740	97.0
12	D.I. Yogyakarta	58,565	60,022	102.5	59,619	101.8	57,795	98.7	57,713	98.5	55,423	94.6
13	East Java	708,854	732,061	103.3	763,478	107.7	736,563	103.9	748,840	105.6	689,666	97.3
14	West Kalimantan	94,490	92,410	97.8	96,818	102.5	86,086	91.1	89,945	95.2	83,054	87.9
15	Central Kalimantan	35,590	38,318	107.7	36,694	103.1	33,911	95.3	33,863	95.1	31,706	89.1
16	South Kalimantan	59,627	60,083	100.8	61,365	102.9	52,507	88.1	54,526	91.4	51,547	86.4
17	East Kalimantan	49,169	40,053	81.5	38,011	77.3	32,612	66.3	33,288	67.7	29,222	59.4
18	North Sulawesi	49,720	59,159	119.0	59,393	119.5	56,995	114.6	56,766	114.2	55,002	110.6
19	Central Sulawesi	50,475	44,149	87.5	45,916	91.0	40,367	80.0	40,944	81.1	41,367	82.0
20	South Sulawesi	165,856	168,406	101.5	175,666	105.9	157,766	95.1	152,214	91.8	151,971	91.6
21	South-East Sulawesi	45,223	32,119	71.0	32,045	70.9	39,296	64.8	39,350	64.9	26,300	58.2
22	Bali	52,674	54,922	104.3	52,398	99.5	49,562	94.1	49,559	94.1	43,955	83.4
23	West Nusa Tenggara	105,847	109,012	103.0	115,833	109.4	112,232	106.0	111,935	105.8	104,763	99.0
24	East Nusa Tenggara	100,584	75,603	75.2	90,644	90.1	66,435	66.0	85,185	84.7	87,001	86.5
25	Maluku	54,485	30,209	55.4	28,760	52.8	23,085	42.4	22,325	41.0	21,059	38.7
26	Irian Jaya	48,591	38,675	79.6	42,112	86.7	30,770	63.3	32,089	66.0	34,710	71.4
27	East Timor	20.971	18,514	88.3	18,599	88.7	14,097	67.2	14,132	67.4	14,148	67.5
	INDONESIA	4,530,913	4,669,219	100.1	4,915,636	108.5	4,351,461	96.0	4,571,192	100.9	4,313,575	95.2

Fig. 4 Coverage by Month, West Java

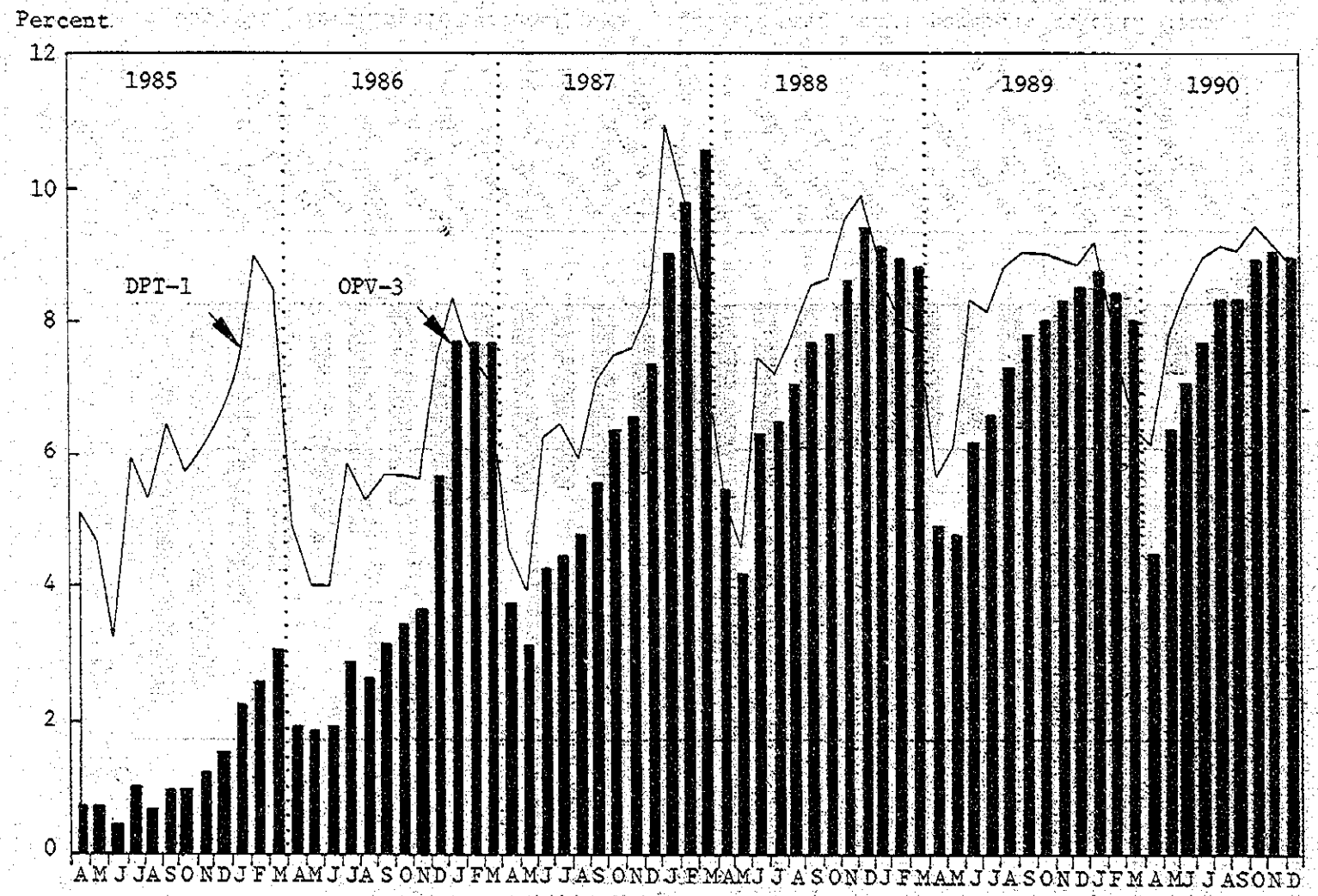
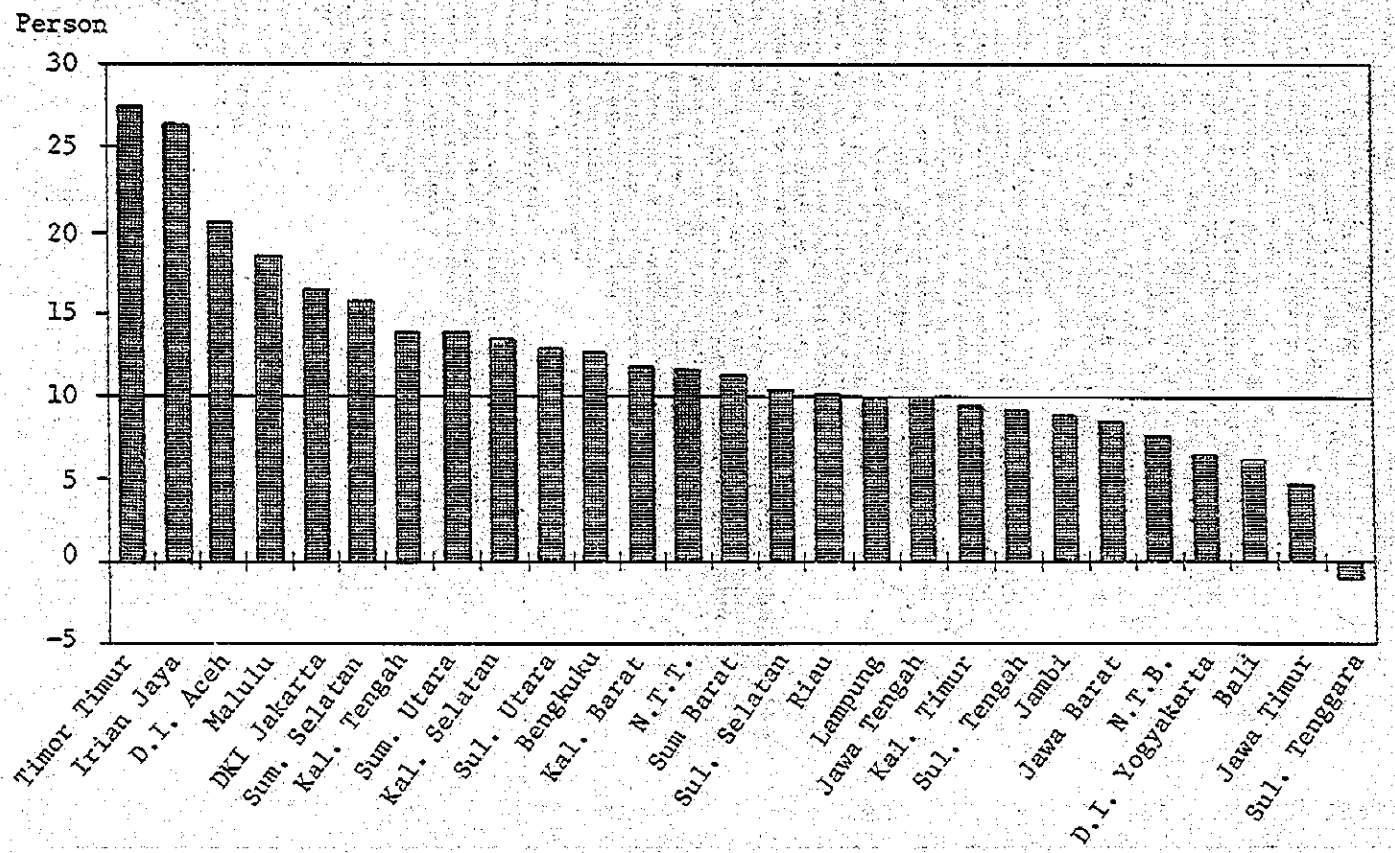


Fig. 5 DROPOUT DPT-1 - POLIO-3
TAHUN 1989/90



Drop Out (DO) lertlinggi terdapal pada propinsi yang punya penduduk relalif kecit. Wataupun lebih banyak propinsi mempunyal D.O. dialas garis yang bisa ditolorir, karena propinsi besar D.O. nya. rendah maka secara nasional D.O. cukup baik. Namun demikian perlu usaha yang karas agar setiap propinsi menurunkan D.O.

(4) SURVEILLANCE AND MONITORING

1) Reported Cases of Poliomyelitis

The reported cases from hospitals by province are shown in Table 15. Table 14 demonstrates the cases in 1990 from Integrated Surveillance System. It reported 225 cases in 1990 in Indonesia.

2) Case Definition

The standard case definition which recommended by WHO is acknowledged among some health staff, but still unclear whether this is practical use or not. The confirmation of poliomyelitis is based on only the clinical observation in 60 days after onset, because of no collection and laboratory diagnosis of specimen.

3) Reporting System

No specific reporting system of poliomyelitis is available by now. The following routine reporting system includes the case report of polio. There had been a multiplicity of reporting system until 1987, followed by development of integrated surveillance system combining to the reports from health centers and hospitals (Fig. 11).

Weekly report from puskesmas is a basic work to know the occurrence of some selected diseases (Fig. 16). The reports are sent to districts, province and also sent as consolidated forms to the CDC. This system provides a passive monitoring of the occurrence and stimulate early warning. The timely and zero reporting including for poliomyelitis is mostly completed.

Monthly report from hospitals are actually more important, because many patients, bypassing puskesmas, visit directly hospitals. The data are reported to puskesmas or district and the central level, but these reports are less completed than the report from puskesmas. Sentinel hospital reporting system also exist, but there is no detailed information.

4) Case/Outbreak Investigation and Control

The formats of case/outbreak investigation are documented in the guidebook for polio (Fig. 17-1 to 3), which is distributed among a variety of relevant facilities such as school, cadres of village and religion. The manual for outbreak control is also published as shown in Fig. 18. However, it is obscure that these systems are practically functioning in any occurrence of poliomyelitis.

5) Problem of Polio Surveillance

Two of the districts we visited reported 16 and 26 cases of poliomyelitis in 1991. However, all the cases without any case investigation turned out to be mostly old paralytic cases and some GBS. The other districts told that they have not had any polio cases since 1975 or 1976, though no immunization had started yet at that time. The weak point of surveillance is not the systems themselves but a lack of understanding of the case definition.

Fig. 6 shows geographical relative risk of polio transmission.

Table 14 POLIOMYELITIS INCIDENCE ALL AGES, 1990

No.	Province	Under 5 Children	Coverage OPV3 (%)	Cases
1	D.I. Aceh	106,986	83.66	49
2	North Sumatera	344,698	95.77	49
3	West Sumatera	112,501	85.72	0
4	Riau	92,768	87.37	1
5	Jambi	66,321	110.51	7
6	South Sumatera	197,909	90.68	0
7	Bengkulu	36,599	87.31	0
8	Lampung	240,471	96.57	3
9	Jakarta	242,687	98.53	0
10	West Java	964,150	96.96	30
11	Central Java	737,024	90.34	0
12	Yogyakarta	65,020	89.06	0
13	East Java	786,978	95.18	0
14	West Kalimantan	104,904	86.48	21
15	Central Kalimantan	39,512	88.75	24
16	South Kalimantan	66,199	84.19	0
17	East Kalimantan	54,588	70.18	0
18	North Sulawesi	55,200	102.84	0
19	Central Sulawesi	56,038	78.18	0
20	South Sulawesi	184,135	90.15	2
21	South East Sulawesi	50,207	71.64	3
22	Bali	58,479	84.66	1
23	West Nusa Tenggara	117,513	95.13	35
24	East Nusa Tenggara	111,670	76.61	0
25	Maluku	60,490	44.38	0
26	Irian Jaya	53,613	63.8	0
27	East Timor	23,282	68.95	0
	National	5,029,942	91.62	225

Resources: SUBDIT IMUNISASI 1990

Table 15 REPORTED CASES OF POLIOMYELITIS FROM HOSPITALS BY PROVINCE FROM 1979–1988

No.	PROVINCE	1979 Cases	1980 Cases	1981 Cases	1982 Cases	1983 Cases	1984 Cases	1985 Cases	1986 Cases	1987 Cases	1988 Cases
1.	D.I. ACEH	–	–	–	–	2	–	3	2		11
2.	SUMATERA UTARA	5	–	1	–	–	–	1	–		45
3.	SUMATERA BARAT	–	–	4	1	–	1	1	2		49
4.	RIAU	–	3	–	–	–	–	–	–		1
5.	JAMBI	3	–	4	2	3	–	–	...		6
6.	SUMATERA SELATAN	13	6	21	6	8	7	8	1		3
7.	BENGKULU	3	5	1	1	2	–	–	...		2
8.	BANDAR LAMPUNG	5	2	–	1	1	1	–	1		0
9.	D.K.I. JAKARTA	5	2	7	3	1	–	–	–		20
10.	JAWA BARAT	2	7	28	4	12	11	7	6		33
11.	JAWA TENGAH	2	1	...	–	22	–	15	–		66
12.	D.I. YOGYAKARTA	4	–	–	2	3	5	2	–		21
13.	JAWA TIMUR	26	19	65	16	57	54	13	16		56
14.	KALIMANTAN BARAT	1	–	1	2	2	–	1	–		35
15.	KALIMANTAN TENGAH	–	1	1	1	–	–	–	–		7
16.	KALIMANTAN SELATAN	1	1	–	–	–	–	–	...		1
17.	KALIMANTAN TIMUR	2	...	...	...	–	–	1	...		6
18.	SULAWESI UTARA	1	–	–	1	–	–	2	1		0
19.	SULAWESI TENGAH	–	2	1	–	–	–	–	–		0
20.	SULAWESI SELATAN	–	9	–	8	3	1	–	3		3
21.	SULAWESI TENGGARA	1	–	2	–	–	–	–	–		0
22.	BALI	20	36	55	25	4	3	11	–		6
23.	NUSA TENGGARA DARAT	1	–	–	–	–	–	1	–		9
24.	NUSA TENGGARA TIMUR	–	...	...	–	2	1	–	–		0
25.	MALUKU	–	–	–	–	1	–	7	1		9
26.	IRIAN JAYA	–	1	–	6	1	–	–			2
27.	TIMOR TUMUR										2
	T O T A L	94	96	179	79	124	84	73	33		393

– = Nil
... = No reports

Fig. 6 Relative Risk - Polio Transmission 14

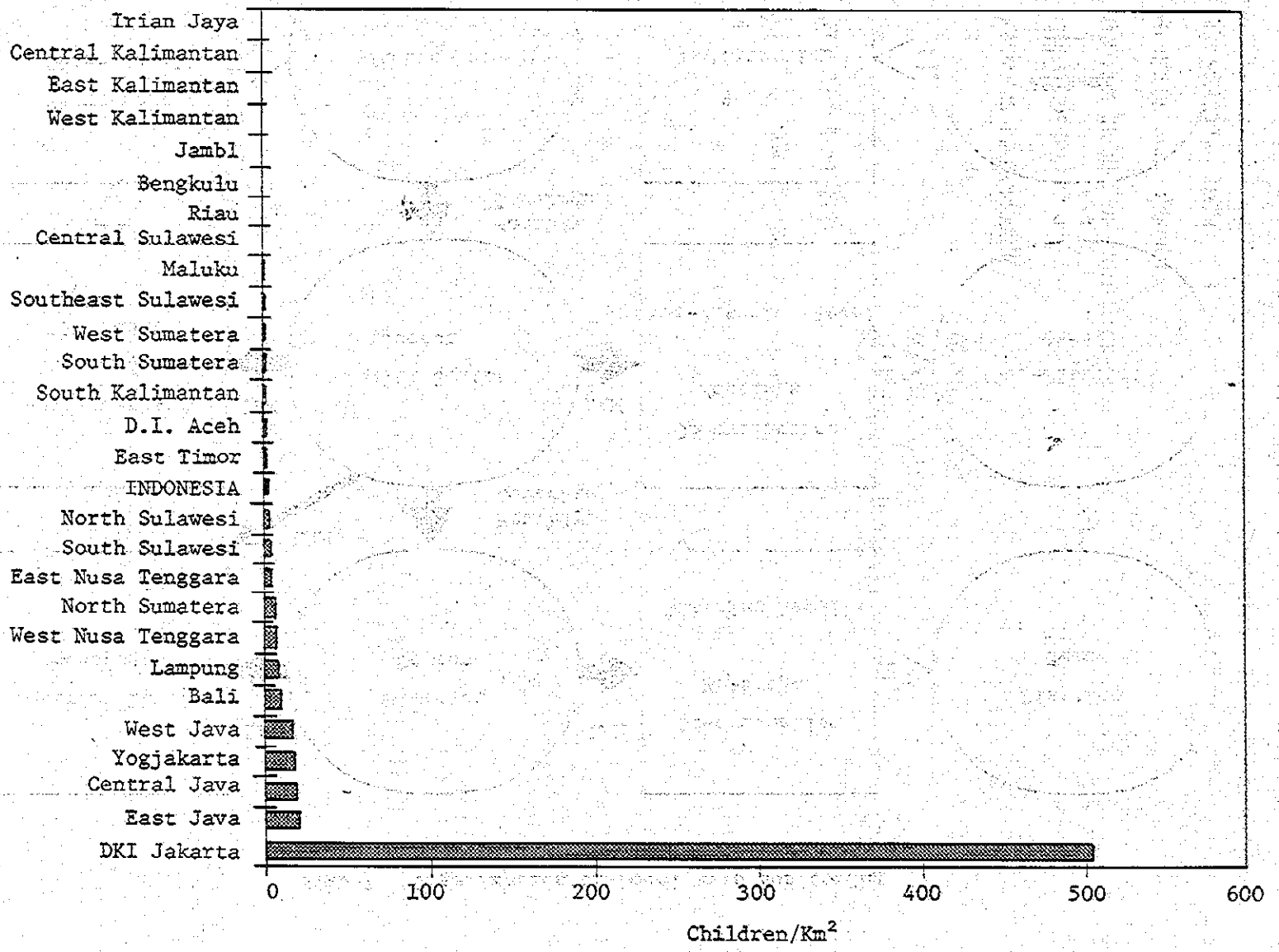


Fig. 7 Organization of Local Area Monitoring

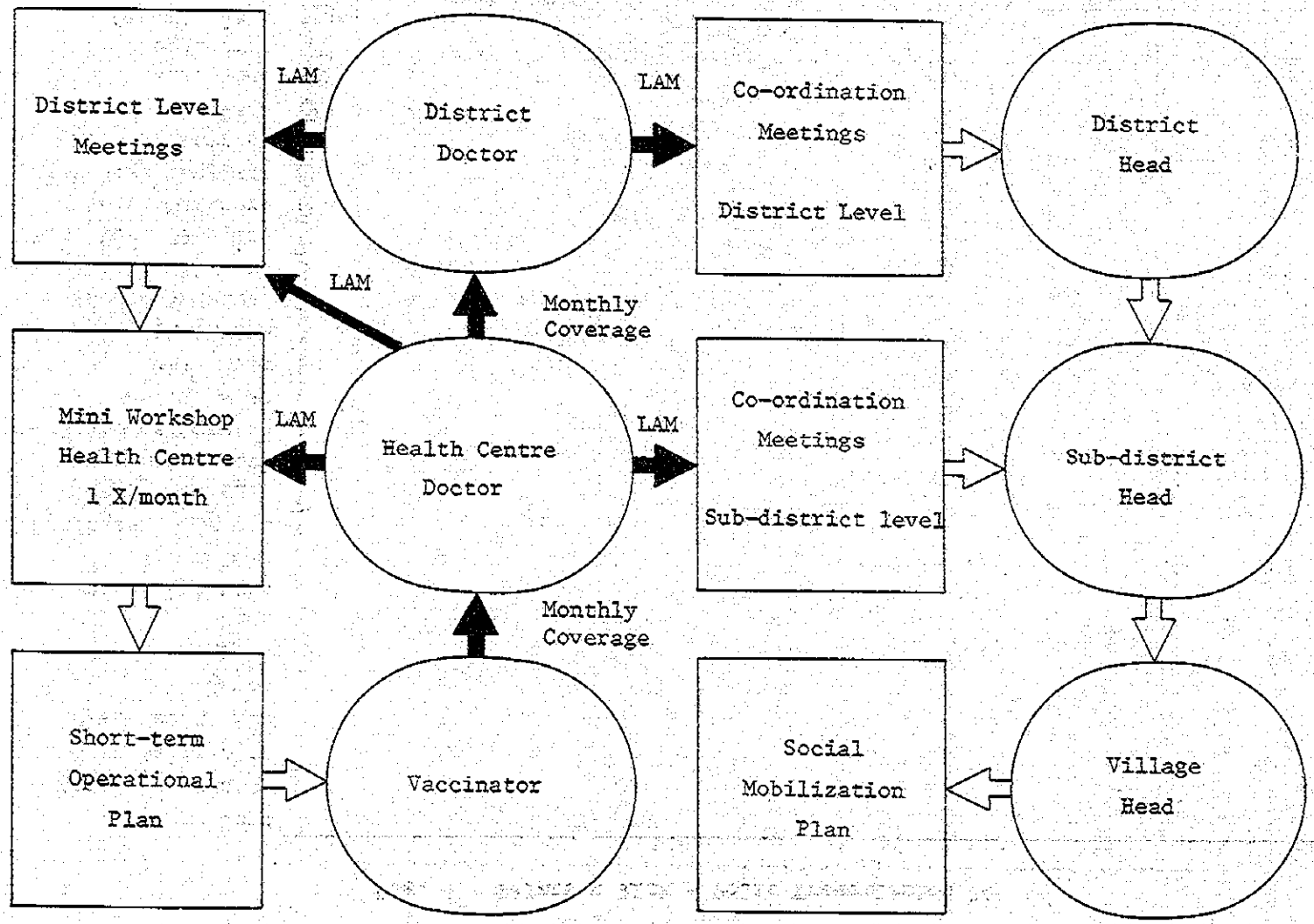
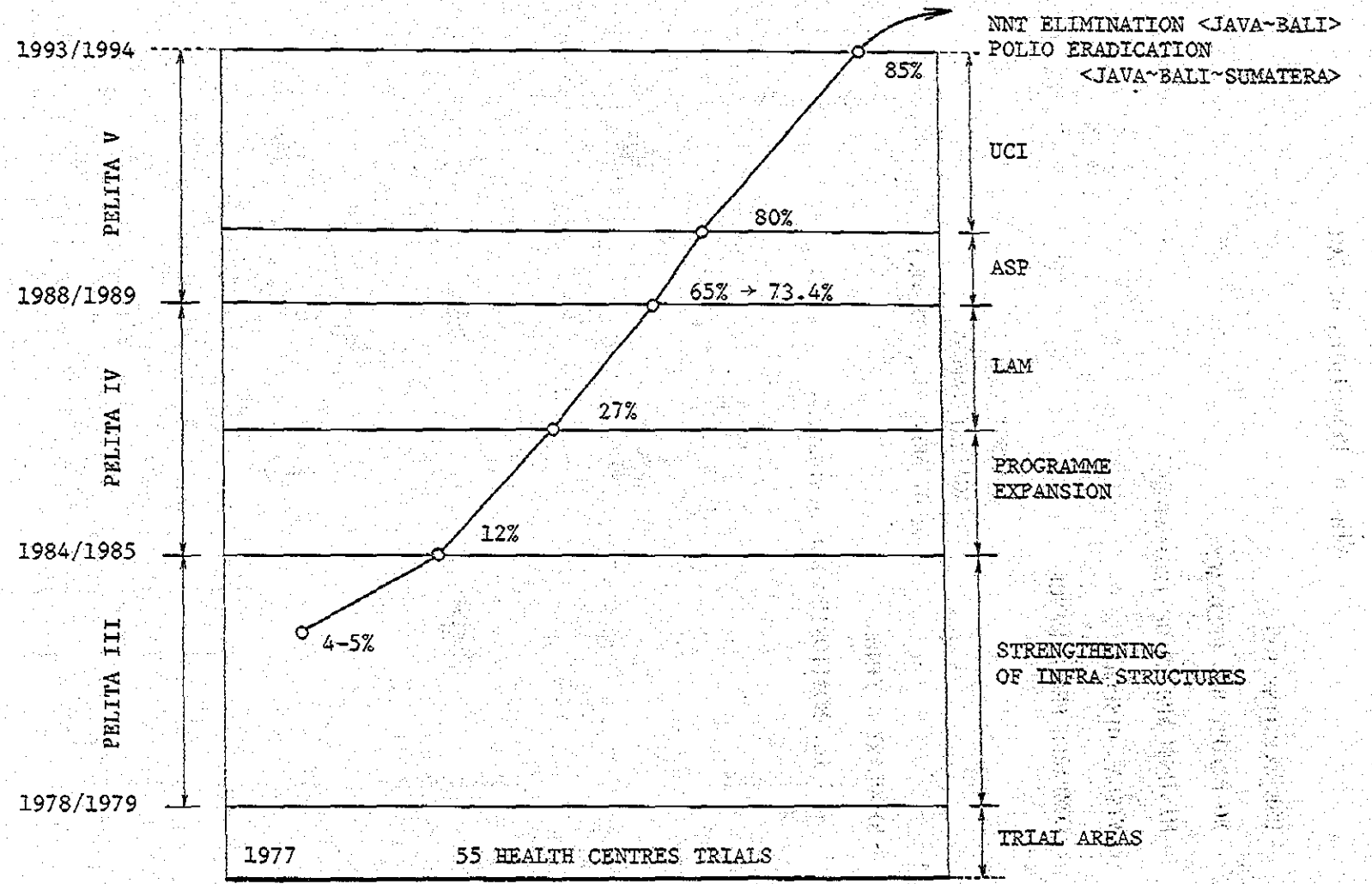


Fig. 8 Principles of LAM

- USE EXISTING DATA
- NO REPORT but FEEDBACK
- MINIMUM NUMBER OF INDICATORS
- VISUAL DISPLAY
- COMPARES PERFORMANCE
  - AGAINST TIME
  - AGAINST TARGET
  - BY AREA (ie. PERSON)
- REGULARY & TIMELY

  ie. MONITORING not evaluation

Fig. 9 EPI Progress and Development From PELITA III - PELITA V.



PELITA: Five Year Development Plan

Fig. 10 The Impact of Local Area Monitoring

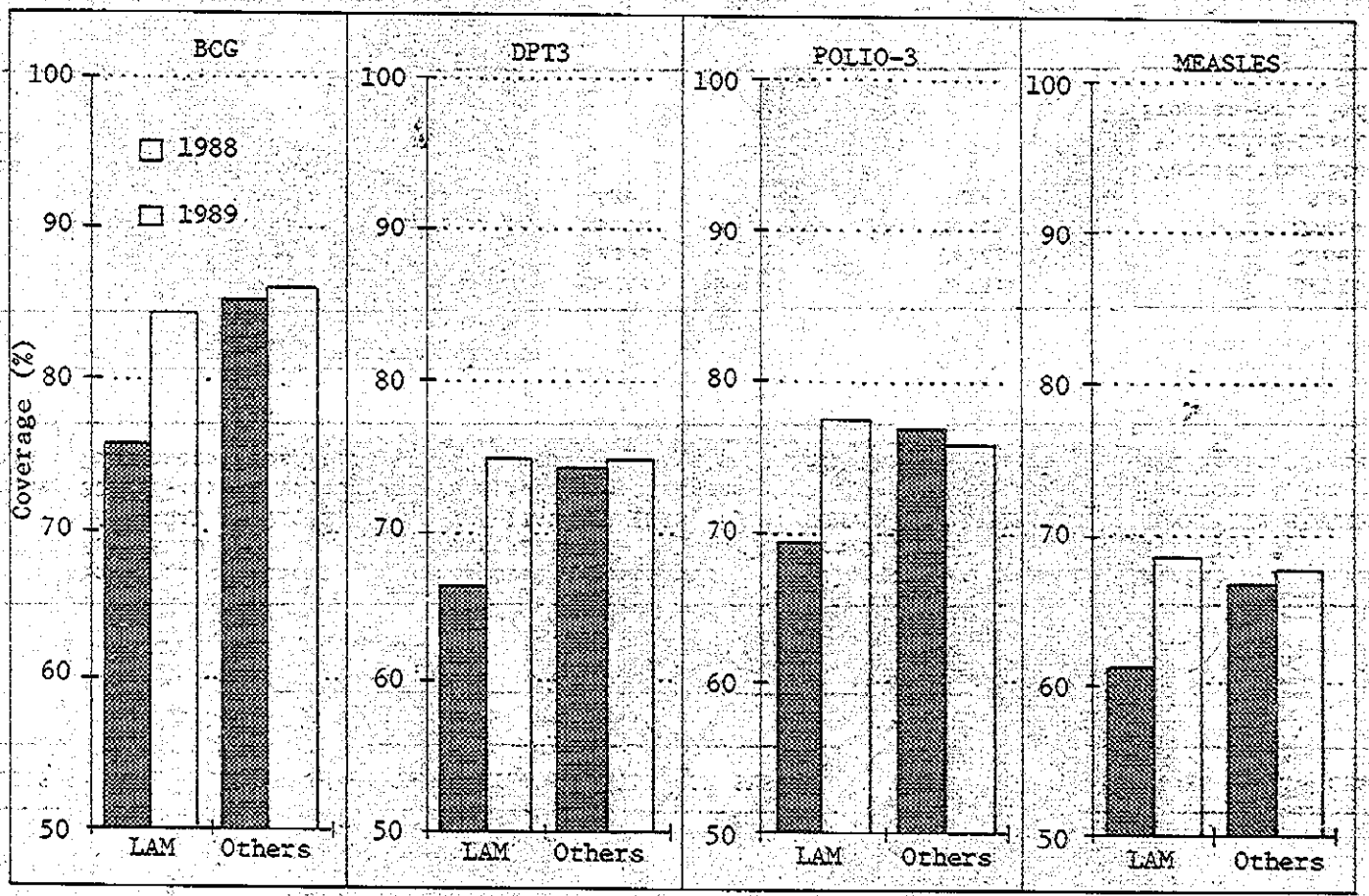
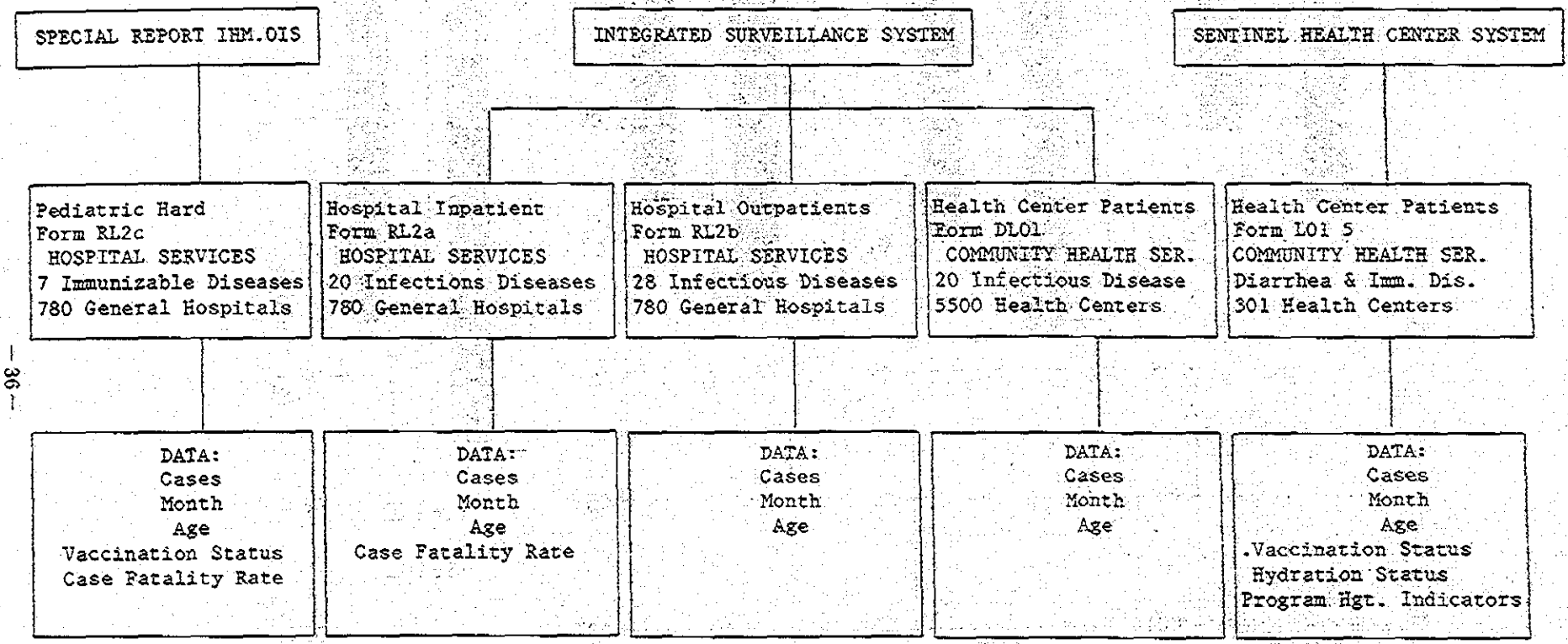


Fig. 11 SURVEILLANCE SYSTEMS OF THE DIRECTORATE GENERAL COC & EH



OTHER ACTIVITIES OF COC
- OUTBREAK INVESTIGATIONS
- SURVEYS AND STUDIES

PETUNJUK
PEMBERIAN MAKANAN YANG SEHAT

Selain
Air Susu Ibu
berikanlah
makanan tambahan

umur 4-6 Bulan

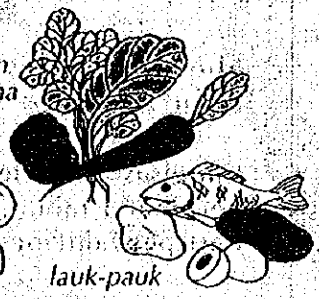
makanan lumat

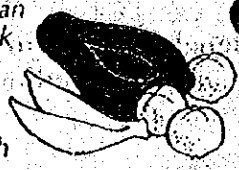
buah

umur 7-12 Bulan

makanan lembik

sayuran berwarna tua





buah

lauk-pauk

CONTOH BAHAN MAKANAN SEHAT

TIDAK DIPERDAGANGKAN

KMS

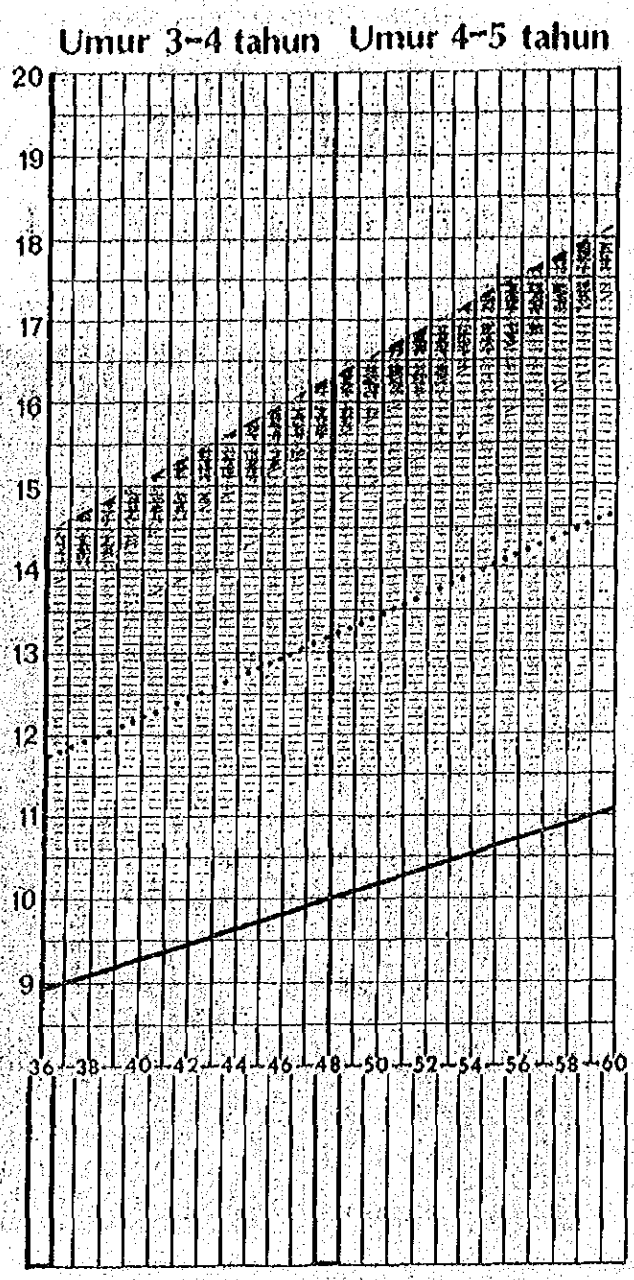
KARTU MENUJU SEHAT

Nama Anak: . . . . . No. Pendaftaran : .....

AIR SUSU IBU
makanan bayi terbaik

Dibuat oleh
Departemen Kesehatan Republik Indonesia
dalam rangka kerja-sama dengan UNICEF
1987

Fig. 12-1



- Bawalah KMS setiap kali berkunjung ke Posyandu dan Sarana Pelayanan Kesehatan.
- Boleh di cetak dengan se-izin Dep.Kes.

CATATAN PEMBERIAN IMUNISASI BAYI UMUR 2 BULAN SAMPAI SEBELUM 1 TH.

Jenis Imunisasi	Tgl. diberikan Imunisasi		
	I	II	III
B.C.G.		■	■
D.P.T.			
Polio			
Campak	■	■	

- Mintakan imunisasi untuk bayi sejak umur 2 bulan.
- Imunisasi harus lengkap sebelum bayi berumur 1 tahun agar bayi terlindung dari penyakit berbahaya.
- Penyakit ringan seperti panas, batuk, pilek dan mencret bukan halangan bagi bayi untuk memperoleh imunisasi.

KAPSUL VITAMIN A-DOSIS TINGGI:

(Diberikan hanya kepada anak balita kecuali bayi sampai umur 1 tahun, satu capsul setiap 6 bulan).

Tanggal diberikan ke 1:
ke 2:
ke 3:
ke 4:
ke 5:
ke 6:
ke 7:
ke 8:

Fig. 12-2

Fig. 12-3

DIISI OLEH PETUGAS

Pos Pelayanan Terpadu (Posyandu) .....

Tanggal Pendaftaran

Nama Anak

Laki-laki		Anak yang ke	Tanggal Lahir
Perempuan			

Berat Badan Waktu Lahir ..... gram

Nama Ayah

Pekerjaan .....

Nama Ibu

Pekerjaan .....

Alamat

CATATAN PENYAKIT YANG DIDERITA

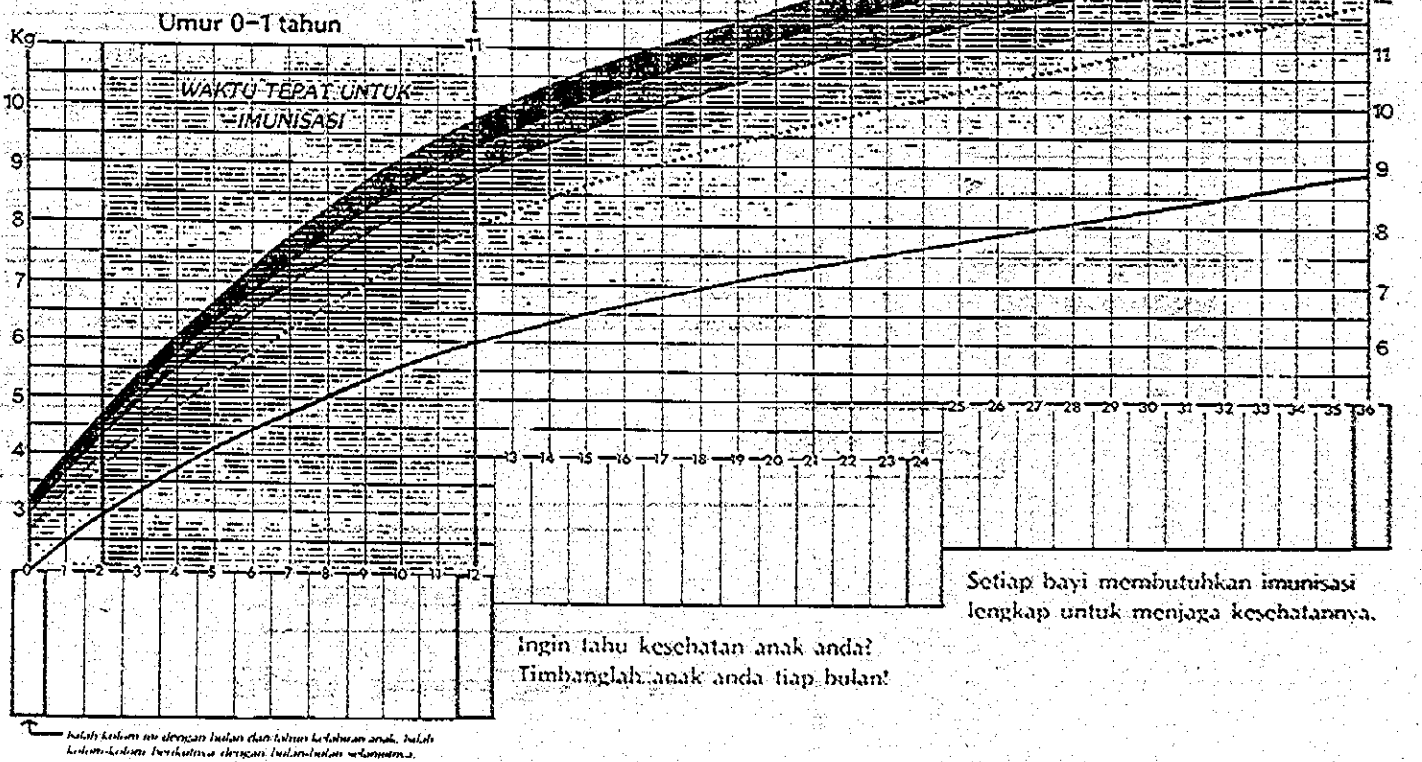
No.	Tanggal	Gejala

I. Bila anak mulai mencret :

- Berikan segera minuman yang ada, misalnya air teh, air kelapa, air sayur, larutan gula garam.
- Teruskan pemberian ASI dan makanan biasa.

II. Bila mencret terus berlangsung dan anak lemas tidak mau bermain:

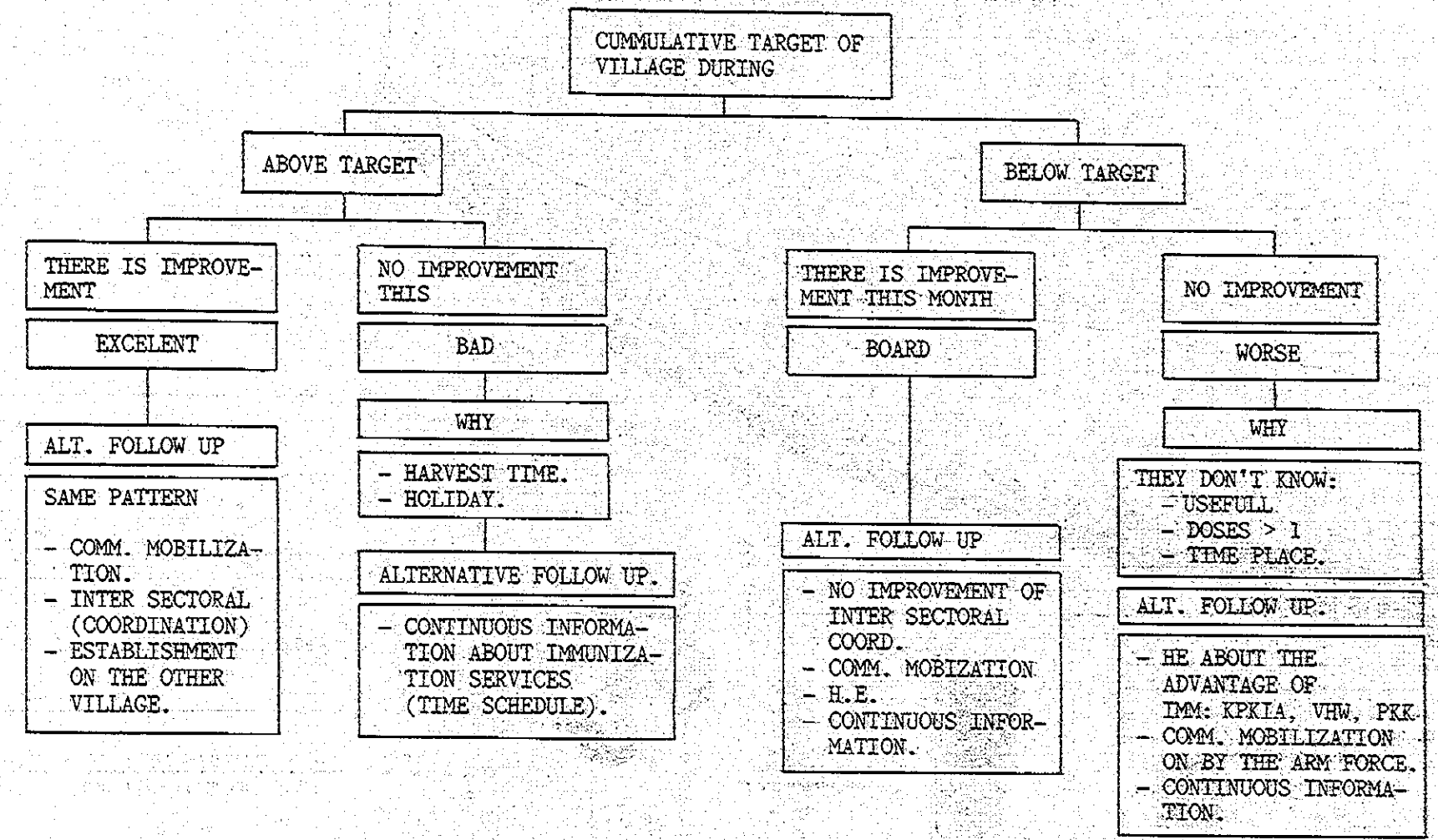
- Berikan segera Oralit.
- Teruskan pemberian ASI dan makanan biasa.



Setiap bayi membutuhkan imunisasi lengkap untuk menjaga kesehatannya.

Ingin tahu kesehatan anak anda?
Timbanglah anak anda tiap bulan!

Fig. 14 Decision Tree L.A.M.



FORM A: CHECK LIST OF IMMUNIZATION PROGRAME

SUPERVISION FORM AND FOLLOW UP
FOR SOLVING THE PROBLEM OF IMMUNIZATION PROGRAME
IN HEALTH CENTER

Health Center : ..... Sub District : .....
Name of Phycisian : ..... Regency : .....
Date : ..... Province : .....

I.A. ANALYZING OF LOCAL AREA MONITORING IN SUBDISTRICT

Is there any correct graph of local ara monitoring of last month per village/catching area in Health Center?

	Yes	No
1) DPT 1	☐	☐
2) Polio 3	☐	☐
3) Drop-out (DPT1-Polio3)	☐	☐
4) Measles	☐	☐
5) TT1 + booster for pregnant women (community/pregnant women mobilization)	☐	☐
6) TT2 + booster for pregnant women (protection level for pregnant women)	☐	☐
7) Drop out (TT1-TT2)	☐	☐

I.B. ESTABLISHMENT OF LOCAL AREA MONITORING IN SUBDISTRICT

8) Did he discuss local area monitoring in the last monthly-meeting of Health Center?	☐	☐
9) Did he send the last month graph of immunization coverage (DPT1, POL3, and TT2 + booster) to Head of subdistrict (check document) ?	☐	☐
10) Did he inform and discuss LAM in the last month coordination meeting at subdistrict (check document) ?	☐	☐
11) Did he send the last month graph of immunization coverage (DPT1, POL3, and TT2 + booster) to Social welfare movement (PKK) (check document)?	☐	☐
12) Did he analyse and discuss the last LAM with PKK for improving social mobilization for the next month?	☐	☐

13) Was he able to visit Posyandu in the planned schedule (if no, how many % : .... %) ? Yes ☐ No ☐

I.C. RECORDING AND REPORTING

14) Is record of recapitulation of immunization activity recorded in the subdistrict recapitulation (blue book) equal to record book of immunization for babies and record book of immunization for pregnant women (red book). Use the following table to confirm Yes/No. ☐ ☐

Village/catching area	Blue book			Yellow book & red book		
	DPT1	3Pol.	3TT1	DPT1	3Pol.	3TT1

15) Is target of immunization reported under one year of age ? ☐ ☐
Use the following table to confirm Yes/No.

Village/catching area	Pol.3 < 1 Year (Yellow book)	Pol.3 > 1 year (Yellow book)	No. of vaccinee

16) Are No. of vaccines in the refrigerator equal to that are recorded in the stock record? (Check at least two kind of vaccines.) ☐ ☐
Use the following table to confirm Yes/No.

Vaccines	No. of Vaccines	Stock Record	Explan.

17) Do vaccum of stock of vaccines never happened during the last three months? ☐ ☐
(Refer to stock vaccine record)

18) Is the temperature of refrigerator recorded in the monitoring temperature card every day in the last month? Yes ☐ No ☐

I.D. VACCINES AND COLD CHAIN

19) Isn't there any vaccine expired in the refrigerator? ☐ ☐

20) Isn't there any vaccine (DPT, DT, TT) freeze? ☐ ☐

21) Isn't there any used vaccine in the refrigerator? ☐ ☐

22) Is the temperature in each refrigerator kept at right temperature (+2 - +8 degree C) ☐ ☐

II. RESUME

No.	Activity	No. of question	Yes		No	
			No.	%	No.	%
A.	Analyse of LMA	7				
B.	LAM establishment	6				
C.	Recording and reporting	5				
D.	Vaccines and cold chain	4				
	TOTAL	22				

III. FOLLOW UP

Write it according its priority of problem.

No.	Problem from answer "No"	Direct action follow up	Indirect action follow up

Comment :

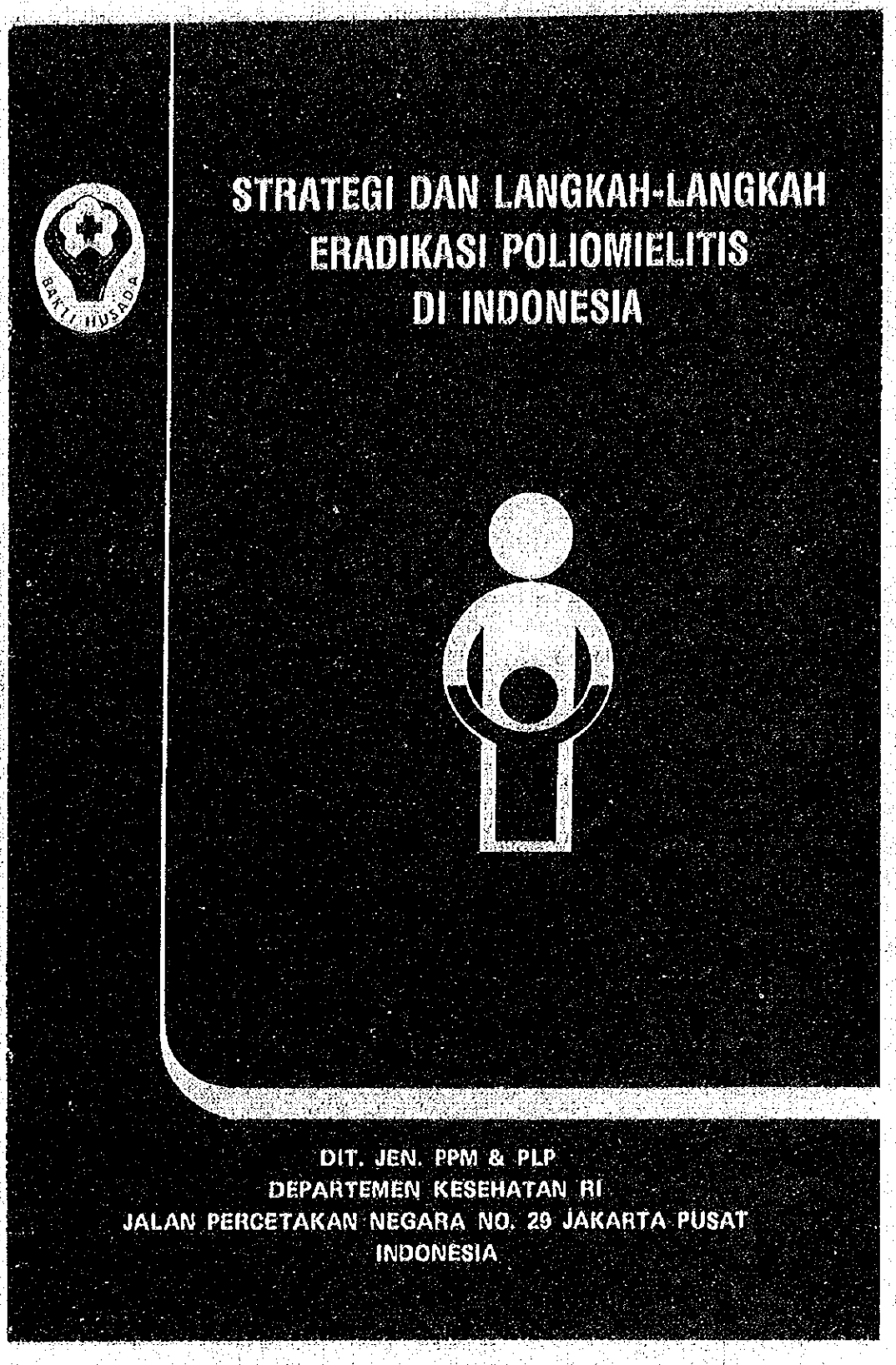

STRATEGI DAN LANGKAH-LANGKAH
ERADIKASI POLIOMIELITIS
DI INDONESIA
DIT. JEN. PPM & PLP
DEPARTEMEN KESEHATAN RI
JALAN PERCETAKAN NEGARA NO. 29 JAKARTA PUSAT
INDONESIA

Fig. 17-1

FP–O

FORMAT LAPORAN SUSPECT PENYAKIT POLIO.

Kepada Yth.
Kepala Dinas Kesehatan Tk. II/
Puskesmas .....
.....
di
TEMPAT

Telah ditemukan tersangka penderita polio/kelumpuhan sebagai berikut :

Nama tersangka : .....
Nama Orang Tua : .....
Alamat/tempat tinggal : .....
Rt/Rw : .....
Jenis kelamin : .....
Umur/tanggal lahir : .....
Mulai Lumpuh tanggal : .....

PELAPOR,

(.....)

Fig. 17-2

FP–i

Field Workers
Reporting Form
PUSKESMAS
Dr.
Health Workers

PELACAKAN/PENCARIAN KASUS TAMBAHAN
DI LAPANGAN

Propinsi : ..... Kab./Kodya ..... Tahun 19....

1. Nama anak .....
   laporan dari : – RS .....
   – URM .....
   – Masyarakat .....
   – Lain-lain.
2. Nama Orang Tua/Wali : .....
3. A l a m a t : .....
4. Umur/Tanggal Lahir : .... tahun .... bulan / Tgl. .....
5. Tanggal mulai Sakit : .....
6. Tanggal Berobat : .....
7. Gejala Klinis waktu serangan akut (beri lingkaran pada jawaban yang dimaksud) :
   a. Panas ..... hari.
   b. Peradangan jalan nafas bagian atas (Pilek, batuk).
   c. Gangguan alat pencernaan (mual, muntah, diare).
   d. Kaku kuduk.
   e. Kelumpuhan.
   f. Lain-lain : (diisi) .....
8. Lokasi Kelumpuhan : 1. Tungkai kanan 4. Lengan kiri
   2. Tungkai kiri 5. Lain-lain
   3. Lengan kanan (Jelaskan)
   .....
9. Kelumpuhan sudah sejak lahir : ya/tidak.
10. Kelumpuhan disebabkan karena kecelakaan/jatuh/suntikan. *)
11. Kelumpuhan didahului oleh sakit yang mendadak : ya/tidak.
    Jika Ya, jelaskan sakit apa .....
12. Sifat kelumpuhan yang ditemukan : *)
    1. Layuh (Flaccid) / Kaku (spastis).
    2. Hilang rasa raba : ada/tidak
    3. Atrophy : ada/tidak
    4. Jalannya Penyakit : progresif : ya/tidak

*). Coret yang tidak benar.

Fig. 17-3

13. Derajat kelumpuhan : Tungkai : 1. Kelumpuhan tampak jelas, bisa berjalan tanpa alat bantu.
2. Bisa berjalan dengan menggunakan alat bantuan.
3. Tidak bisa berjalan.

Lengan : 1. Bisa bergerak, tetapi tidak sekuat lengan satunya.
2. Tidak bisa bergerak.

14. Status Imunisasi Polio :

	TANGGAL	TEMPAT
a. Polio I	.....	.....
b. Polio II	.....	.....
c. Polio III	.....	.....
d. Belum Pernah	.....	.....
e. Tidak Tahu	.....	.....

RIWAYAT KONTAK PENYAKIT.

15. Sebutkan tempat-tempat di luar tempat penderita tinggal, yang dikunjungi oleh penderita kira-kira 2 minggu sebelum terjadinya lumpuh?

LOKASI	ORANG YANG DIKUNJUNGI	KAPAN DIKUNJUNGI
.....	.....	.....
.....	.....	.....
.....	.....	.....

16. Apakah penderita berkunjung ke rumah tetangga atau anak-anak yang baru mendapat imunisasi Polio dalam waktu 2,5 bulan sebelum menjadi lumpuh? a : Ya b : Tidak

NAMA	ALAMAT	TGL. DIIMUNISASI
.....	.....	.....
.....	.....	.....

17. Keadaan Lingkungan.

a. Penyediaan Air : a. Air sumur d. Air kali
b. Air ledeng e. Air hujan
c. Air pompa

b. Pembuangan Air Kotor :
a. Riol-riol
b. Selokan
c. Comberan

c. Tempat pencuci alat-alat dapur terpisah/tidak dengan tempat mandi.
a. Terpisah
b. Tidak terpisah.

d. Pembuangan saluran kakus (Saluran tinja) :
a. Menuju septic tank.
b. Menuju selokan yang terbuka.

18. Specimen-specimen Index kasus dan kontak tersangka.

NO. URUT	NAMA KONTAK/ TAMBAHAN	SEX	UMUR	TGL. MULAI SAKIT	GEJALA				SPESIMEN			STATUS VAKSINASI
					PANAS	MENGERET	PARINGITIS	PARALYSE	SERUM	FAECES	LAIN-LAIN	
									1 2	1 2		

KETERANGAN : * Diisi bersama jika ia Index kasus
— Status Vaksinasi diisi :
Vak. 1, Vak. 2, Vak. 3, belum, tidak tahu.

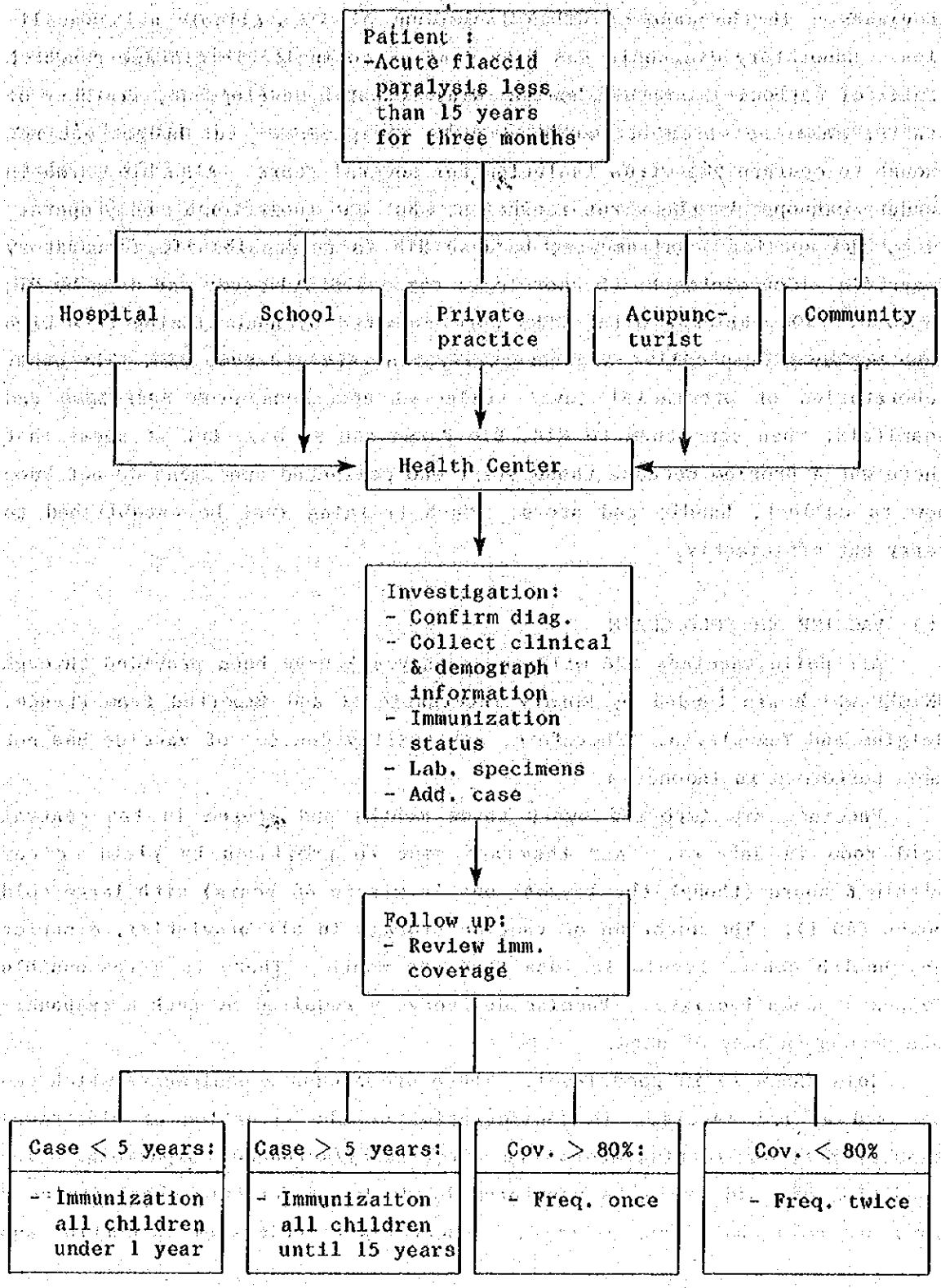
19. Penderita tersebut telah diperiksa dokter/supervisor pada tanggal ..... dengan diagnosa :
1. Paralyse akibat Poliomyelitis
2. Trauma
3. Lain-lain (sebutkan) .....

....., Tgl ..... 19...

DOKTER/SUPERVISOR
YANG MEMERIKSA,

(.....)

Fig. 18


Patient :
-Acute flaccid paralysis less than 15 years for three months
Hospital
School
Private practice
Acupunc-turist
Community
Health Center
Investigation:
- Confirm diag.
- Collect clinical & demograph information
- Immunization status
- Lab. specimens
- Add. case
Follow up:
- Review imm. coverage
Case < 5 years:
- Immunization all children under 1 year
Case > 5 years:
- Immunizaiton all children until 15 years
Cov. > 80%:
- Freq. once
Cov. < 80%
- Freq. twice

(5) LABORATORY SERVICES

Laboratory services in Indonesia are not enough. All provinces have laboratory services, but serologic test is available at 5 facilities in 27 provinces. In the case of virus isolation, it is available at 2 facilities. Laboratory diagnosis has been done at communicable disease research center of national institute health (NIH) research development, ministry of health, Jakarta, which has some adequate equipments. But budget was not enough to operate the virus isolation for several years. Also Bio Farma in Bundung can operate the virus isolation. But the isolation is only operated by the special requirements, because NIH is responsible for laboratory diagnosis. Concerning to the serologic test, a field study was done by NIH in 1990. 400 children after OPV3 were examined by neutralizing test with Java monkey kidney cell. The seroconversion rate was over 95%. The other laboratories of provincial level collected specimens from Puskesmas and hospitals, then sent them to NIH, Bio Farma and so on. But it seems that there was a problem because those staff who collected specimens do not know how to collect, handle and store. Such training must be established to carry out efficiently.

(6) VACCINE AND COLD CHAIN

All polio vaccines (26 million doses/year) have been provided through UNICEF which are funded by Rotary international and imported from France, Belgium and Yugoslavia. Therefore, any quality control of vaccine has not been performed in Indonesia.

Vaccines are imported every three months and stored in the central cold room in Jakarta. And they are sent to provinces by plain or car within 6 hours (though the longest one is within 48 hours) with large cold boxes (40 l). The duration of vaccine storage in all provincial, district and health center levels is less than one month. There is a responsible person at each facility. Vaccine delivery is required by such a responsible person in case of need.

Cold chain is in good level. There are adequate equipments which can be used at all levels. In consideration of the situation of electrical supply, most of refrigerators are electricity/kerosene compatible. The condition of cold chain is monitored by daily temperature chart (twice a day) and cold chain monitor card. Concerning to cold room in central and

provincial level, automatical temperature recorders with alarm system are used. Cold chain is adequately monitored in all facilities where we visited. (Table 16)

Vaccine potency test is operated by CDC. But we could not see the results of OPV this time.

Bio Farma has launched "live vaccine production project of polio and measles" which is supported by JICA. OPV production in Indonesia will start by 1993.

With the decrease in polio cases, the role of laboratory services will be more important. I think there are two ways to reinforce laboratory services. One is the enforcement of national laboratory (only one), and another one is the reinforcement of transportation system of sending speciemens to the reference laboratory. And I think such reinforcements are depending on national plan.

Table 16 DATA COLD CHAIN DI PROPINSI TAHUN 1988/89 (DATA BALI)

No.	PROPINSI	VACCINE DEPOT OF PROVINCE			KABUPATEN		PUSKESMAS		KETERANGAN
		COLD ROOM	FREEZER	MODIFIKASI	REFRIGE	FREEZER	REFRIGE	FREEZER	
1	D.I. ACEH	-	3	4	29	16	137	-	Type Freezer & Modifikasi
2	SUMATRA Utara	1	5	1	25	20	264	-	- SCF 1550
3.	SUMATRA BARAT	-	2	7	28	14	278	-	- SCF 2850
4.	RIAU	-	2	5	15	7	145	-	Type Refrigerator
5.	JAMBI	-	4	3	8	7	90	-	- Sanyo SR 140 AK
6.	SUMATRA SELATAN	1	3	1	11	10	250	-	- Sanyo SR 141 AK
7.	BENGKULU	-	2	4	8	5	121	-	- Sanyo SR 1405 W
8.	LAMPUNG	1	4	8	8	4	182	-	- Slextrolux RCW 42 BK
9.	D.K.I. JAKARTA	-	4	3	15	7	268	-	
10.	JAWA BARAT	1/1	8	3	130	24	760	-	
11.	JAWA TENGAH	1/1	6	-	72	35	577	-	
12.	D.I. YOGYAKARTA	1-	1	12	11	5	108	-	
13.	JAWA TIMUR	1/1-1	7	-	48	37	1104	-	
14.	KALIMANTAN BARAT	-	4	3	7	7	112	-	
15.	KALIMANTAN TENGAH	-	4	7	23	11	126	-	
16.	KALIMANTAN SELATAN	-	3	4	22	11	149	-	
17.	KALIMANTAN TIMUR	-	1	8	12	7	85	-	
18.	SULAWESI UTARA	-	3	9	24	7	121	-	
19.	SULAWESI TENGAH	-	4	9	8	4	93	-	
20.	SULAWESI SELATAN	1	4	-	23	25	155	-	
21.	SULAWESI TENGGARA	-	4	6	12	4	69	-	
22.	BALI	1	4	2	24	8	76	-	
23.	NUSA TENGGARA BARAT	-	2	7	12	6	108	-	
24.	NUSA TENGGARA TIMUR	-	3	8	25	12	67	-	
25.	MALUKU	-	1	3	10	5	82	-	
26.	IRIAN JAYA	-	2	2	26	9	103	-	
27.	TIMOR TUMUR	-	1	10	26	-	40	-	
	T O T A L	8/3	91	129	662	307	5522	-	

(7) SOCIAL MOBILIZATION

1) Community Involvement

The health system of Indonesia is based on Integrated Health Services Post (Posyandu). (See Fig. 19 and 20.) Posyandu is voluntary-based community and its activity is strengthened by the government. Its target is comprehensive community on health development such as EPI, CDD, Nutrition, MCH and Family Planning. It is organized by three or four voluntary village health promoters who are usually members of community women's association. There by the wives of political leaders of villages another one is Dharma Wanita which means general women's association.

These village health promotors are conducted by an official health worker of health center of sub-health center. They have a monthly health session and implement five activities mentioned above. (Actually Posyandu means this session.)

Concerning EPI, Posyandu takes charge of the registers of a birth and supplies MCH card including EPI record, also immunizes according to the immunization schedule. Vaccinator is usually the same official health worker mentioned above. He/she is sent from health center or Sub-health center called PUSKESMAS or Sub-PUSKESMAS. Posyandu activity has a strong connection with Puskesmas. Although vaccination is available everyday at Puskesmas, in point of accessibility, Posyandu plays an important part. Vaccination at Posyandu is free of charge. Usually, one Posyandu covers more than twenty families at sub-village level. There are three to seven Posyandus in a village. In Indonesia, there are about 220,000 Posyandu which are supervised by about 5500 Puskesmas. (See Fig. 20)

Through field study, it seemed that people are highly motivated, and enthusiastic to join Posyandu, as a result, the coverage of immunization is very wide. It is presumed that political consideration has been taken at national level to carry out the immunization program.

2) Political Consideration

Posyandu activity is under the Indonesian National Program. Therefore, the immunization including polio eradication is also national program. The government carries out many enlightment project to strengthen

this program. (Fig. 22, Fig. 24)

For example, the photograph of President Soeharto and polio vaccination to a baby, can be seen every where in Indonesia on billboard, leaflet and book. Another example is a TV spot CM about immunization. It is two minutes program and broadcasted everyday. In addition, PKK, which is the association of wives of political leaders and major human resource for Posyandu, is strongly supported by the government. To encourage people, the local government at each level conducts health activity contest based on immunization coverage etc. Finally, the government holds national level contest and gives award to the winner community.

3) Health Education and Enlightment

To implement the health education for the people, the local government has made their own plans. The Table 18 shows the activities which were planned and carried out by the District Health Office, Klaten District, Central Jawa during 1989-1990. It is a good example for Health promotion.

Health information is disseminated through many media - TV, radio, slide, printing media and so on.

Fig. 23-1 and 23-2 show the promotion consultation card which village health promotors use during Posyandu activity. The words "Ayo ke POSYANDU" mean "Visit Posyandu" and can be seen on the billboard anywhere throughout Indonesia.

Fig. 19 Organizational Structure for EPI and Polio Eradication

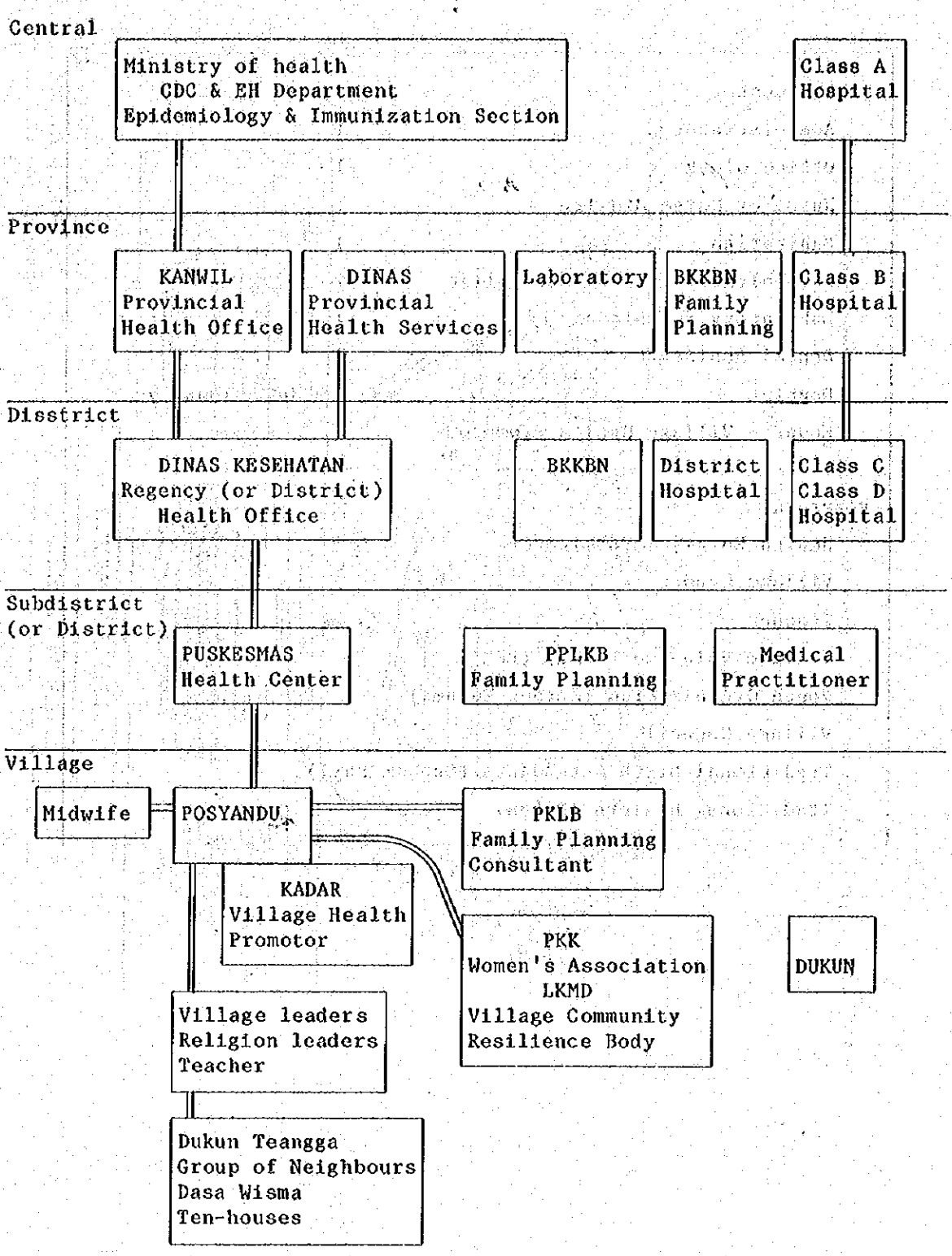
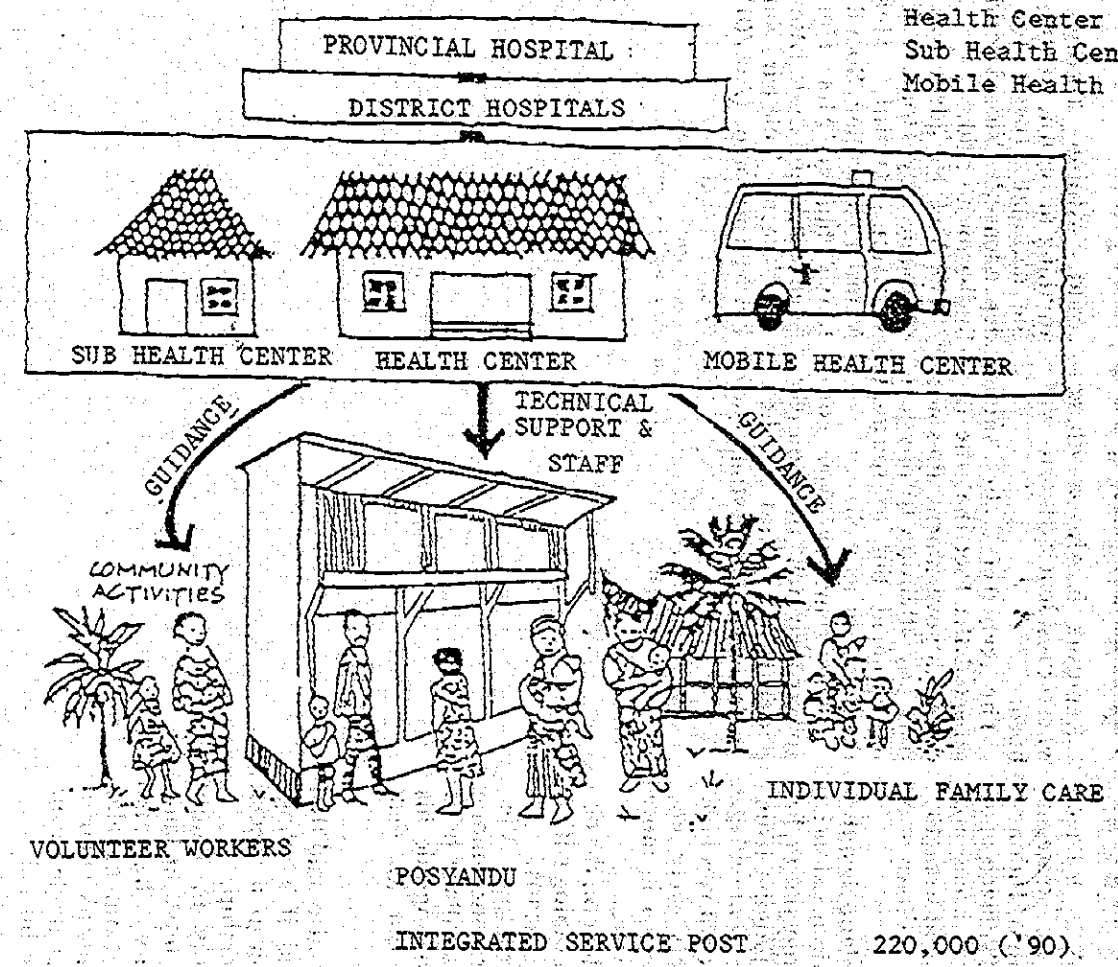


Table 17 Manpower

Health Center	
Administrator	1
Office Clerk	1
Nurse or Nurse Midwife	1
Sanitarian	1
Communicable-Disease Controller	2
Laboratory Technician	1
Dental Assistant	1
Dentist	1 - Occasionally
Kadar = Village Health Promotor	1
Posyandu	
Health Worker = Vaccinator	
Village Leader	
Teacher	
Village Volunteer Woman (PKK)	
Youth Organization (Karang Taruma)	
Village Council	
Traditional Birth Attendants (Dunkum Bayi)	
Traditional Healers (Dukun)	



Health Center 5,639 ('88)
Sub Health Center 19,636 ('89)
Mobile Health Center 4,000 Cars
67 Boats

Fig. 20 The Position of Health Centre in the Health Service Network

Village development plays strategic role, Sudharmono says

YOGYAKARTA -- Village development plays a strategic role since 70 percent of Indonesian population are villagers and the country's rural areas are also a basis of national strength, Vice President Sudharmono said here Friday.

When officially launched the national rural civic mission in Bantul regency, Yogyakarta, he further said that judging from the strategic role that village development played, it was high time that villagers were encouraged to take part in more development activities.

The Vice President on the occasion also held a dialog with a number of village heads.

During the dialog, Vice President Sudharmono among others said that a village head must continue to upgrade his ability to carry out his task smoothly.

However, he also said that it would be good if a village head could undergo a special training on leadership.

During his stay in Bantul regency for the mission launching ceremony, he also dedicated the Somenggalan Cemetery in Kemusuk villagers died during the struggle for independence were buried.

Kemusuk is also a village where President Soeharto was born.

The cemetery, he said, reflected the fact that the Indonesian government does not only pay attention to physical development but to spiritual development as well.

"The cemetery was constructed to tell the younger generation that their predecessors did everything they could, without asking for anything in return, to support the national struggle for independence," Vice President Sudharmono said.

The Vice President was accompanied by Home Affairs Minister Rudini, Health Minister Adhyatma, Social Affairs Minister Mrs Haryati Soebadio," and State Minister for Women's Role Mrs Sulasikin Murpratomo. (Ant/01)

Fig. 21

JAKARTA POST 6 March

Jakarta gets award for immunization success

JAKARTA (JP): The city administration Tuesday received a certificate of appreciation from Health Minister Adhyatma for reaching the immunization target set under the Universal Child Immunization 1990 scheme.

Nationwide, UCI's target was reached last November, when 80 percent of all children under one year old had been immunized for diphtheria, (DPT), polio and measles.

DPT immunization in Jakarta was 99 percent, 4 percent higher than the target. Polio immunization was 98.5 percent, higher than the 85 percent target, while measles immunization was 83.4 percent or 3.4 percent higher than the target.

Accepting the award yesterday, Governor Wiyogo Atmodarminto said the achievement was the result of good cooperation among government agencies and public involvement, particularly at district level.

The city administration will, therefore, present awards to 18 districts throughout the city for making it possible for the city government to reach the national target, said Wiyogo.

The governor admitted however, that despite the success in reaching the target, there was still the problem of unequal distribution of immunization at sub-district and district levels.

"There were areas with small coverage and others with extremely good coverage, so we will focus our attention on having the target reached equally in all areas," said Wiyogo.

"All sub-district and district heads will be expected to supervise the immunization program so that there will not be one baby below one year old who has not been immunized," he said.

Fig. 22

Table 18 Health Promotion Activities in Klaten District, 1989-90

I. Health Information			
Radio	30 times	Poster Session	10 times
Advertising	1	Cassette	29
Slide	10	Traditional Media	2
Film	3	Billboard	1
Printing Media	5,243 number	Group Discussio	20,406
II. Community Participation			
Village Health Promotion	6	Villages	
Family Planning Promotion	2		
Teacher Training	-		
Health Worker Training	6		
*Little Doctor Training (*Health education program for elementary school pupils)	6,692	pupils	
Youth Organization	1	Village	
Village Health Contest Event	6	times	
Nutrition Education Contest	6		
Village Health Promotor Training	800	persons	
Promotion Consultation Card	1,750	books	
III. Training of Mid-level Health Workers			
Posyandu Health Promotors	38	times	
Puskesmas Health Workers	38		
District Health Officers	1		
IV. Health Contest			
School Health Promotion Elementary School	6	times	
Healthy Teeth Promotion	58		
Under 5 Babies Contest	26		
Knowledge Contest of Little Doctors	26		
Knowledge Contest of Health Promotors	26		
V. School Health Services Screening			
Elementary School	2,440	pupils	
Secondary School	2,339		
High School	-		

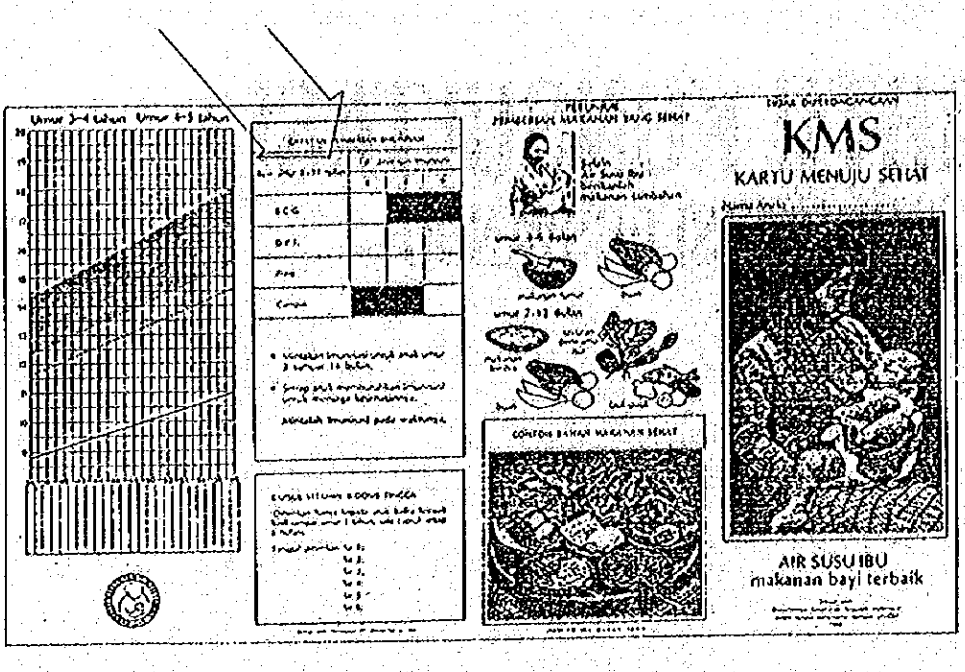
KARTU KONSULTASI
PROMOSI POSYANDU

DEPARTEMEN KESEHATAN R.I.
PUSAT PENYULUHAN KESEHATAN MASYARAKAT

Ayo ke
POSYANDU
Menjaga anak sehat tetap sehat

1989

Fig. 23-1


KMS
KARTU MENUJU SEHAT
AIR SUSU IBU
makanan bayi terbaik


TBC
DIFTERI
BATUK REJAN
TETANUS
POLIO
CAMPAK

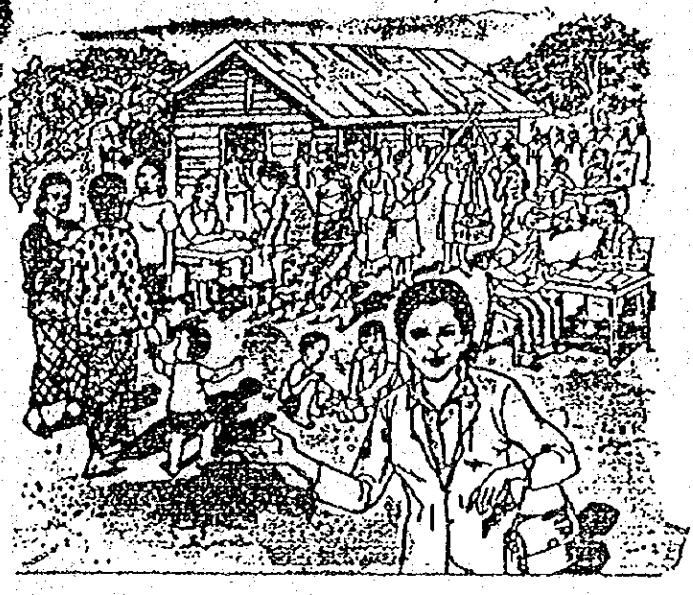


Fig. 23-2

PEDOMAN
MOTIVASI DAN PENYULUHAN IMUNISASI
MELALUI
JALUR KEGIATAN AGAMA ISLAM

DEPARTEMEN AGAMA
DIREKTORAT JENDERAL BIMBINGAN MASYARAKAT ISLAM
DAN URUSAN HAJI

لَوْلَا أَنْ أَشُقَّ عَلَى أُمَّتِي لَأَمَرْتُهُمْ بِالسِّوَاكِ عِنْدَ كُلِّ وُضُوْءٍ
- رواه مالك الشافعي والبيهقي والحكم -

Artinya: "Kalaulah tidak memberatkan umatku, niscaya aku wajibkan mereka menggosok gigi setiap hendak melakukan wudhu" (H.R. Al Baikhaqi Malik, Assyafii, dan Hakim).

Islam mengatur cara berwudhu dengan mendahulukan membasuh kedua belah tangan, dimaksudkan agar dapat diketahui keadaan air tersebut sebelum mengenai anggota wudhu lainnya. Di samping itu dimaksudkan juga agar kotoran dan bakteri yang mungkin ada di kedua tangan tersebut dapat dibersihkan terlebih dahulu. Dalam hal menjaga kebersihan makanan, agar tidak terkena hama penyakit, Rasulullah bersabda:

Fig. 24

(8) TRAINING

Training courses are carried out at national and local level. (Fig. 25)

1) At the national level, national health training center is responsible for training of doctors. In Indonesian medical curriculum, there are 17 major preventive medicine programs including EPI, and medical students must be trained in the center. The duration of course is varied in each program.

Concerning EPI and Polio Eradication, trainees (usually doctors working at provincial level) are sent to national training center. Course is usually conducted once a year.

2) Provincial health office is responsible for the training of vaccinators, midwives and doctors of district and subdistrict level at the provincial training center.

The training course is held yearly and in 1991, 2000 vaccinators will be trained in Indonesia.

3) At the district level, district health office holds staff meeting monthly and simultaneously holds routine training for health workers of Puskesmas.

4) At the health center (Puskesmas) staff hold meeting for microplanning of community health development weekly.

Besides, Puskesmas conducts village health promoter (Kader) monthly (every 35 days) meeting and necessary training is taken place there.

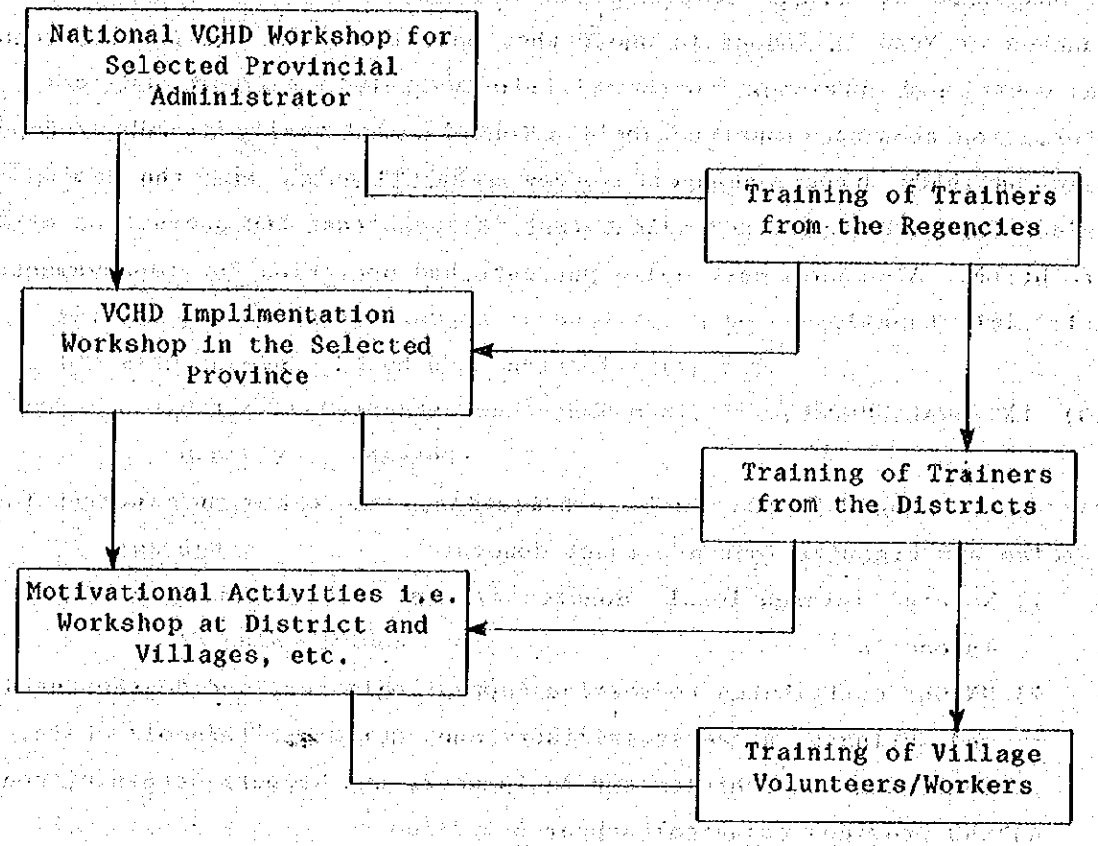
5) Puskesmas is responsible for Posyandu activity through Kaders who educate people. Through this channel, Puskesmas can supervise village leaders meeting, religion authority meeting and school teachers meeting.

This kinds of meeting are held every 35 days (Selapanan meeting) and doctors of Puskesmas can train these opinion leaders about health programs including EPI and polio eradication.

Cold chain management is taken care of by vaccinators. Training course for them includes this program.

Laboratory network is not established yet in Indonesia. Therefore, training courses for specimen collection, transport, virus isolation and diagnosis are not available now.

Fig. 25 Systematic Approach to VCHD Implementation



(9) REHABILITATION

The rehabilitation in Indonesia mainly based on community based rehabilitation (CBR) activities supported by PKK as volunteer resource. We visited CBR development and training center in Solo. This center implements CBR program, monthly training, development of CBR tools, some studies, provision of medical equipment to district hospitals and so on. Actually rehabilitation program has been carried out in YPAC (the society for the care of disable children which is a part of CBR. There are 15 branches of YPAC in Indonesia where they have their own equipments, school and vocational training course. Unfortunately we could not get the information about national rehabilitation plan. Actually a number of post polio patients have a chance to get rehabilitation and the number of trained CBR workers is increasing. But it seems that the activities of CBR were brisk. Also some post polio patients had operation for improvement of their limb's function.

(10) EXTERNAL SUPPORT

Concerning EPI and Polio eradication, the following international agencies and organizations are major donors;

1) Rotary International donates polio and measles vaccines to Indonesia
2) UNICEF contributes to vaccine supply logistics, and donates needles and syringes, steam strerilizers and equipments for cold chain.
3) USAID donates vehicles and equipments, and supports training course
4) WHO provides technical supports
5) JICA cooperates under polio and measles vaccines production project in Bandung
6) Australia supports Hepatitis B prevention project
7) OECF
8) NGOs like CONCERN, CARE and PATH

While, IGGI, World Bank and UNDP are the major donors for economic development. However, in the meaning of EPI and polio eradication, their activities are relatively low.

The percentage of health budget of GNP in Indonesia is 2.0 to 2.4%. This figures is not so high. Considering economic situation, external support is necessary for a while.

IV. CONCLUSION

(1) Toru CHOSA

Considering polio eradication by 1995 from our region, there are two possible strategies.

One is the method based on mass-campaign and mopp-up operation, which is being introduced in American region. It is obviously effective. However, it requires a huge budget, especially for vaccine supply. Concerning China, it seems difficult to introduce this method there without any modification.

Another one is the method utilizing comprehensive voluntary based community health system which has been introduced in Indonesia.

Each strategy which mentioned above has advantages. With respect to Asian countries, alternative strategy led from the above strategy should be adapted.

EPI and polio eradication in Indonesia can be characterized as folows:

1) High coverage based on routine immunization
   - daily at Puskesmas and other medical facilities
   - monthly at Posyandu
2) High coverage due to the participation of well-informed community residents
   - through Posyandu activity
   - through various media
3) Highly motivated health volunteers
   - mobilization of women's association
4) Well developed coverage report system
5) Strong support by political consideration
   - national program
   - enlightment activity by the government
   - PKK (association of wives of political leader) commitment
6) Relatively less developed surveillance system
   - especially outbreak control methodology due to long-term absence of polio cases in urban area
   - case definition format
7) Well-organized training system
8) No laboratory services

These facts remind me the experience of polio vaccine introduction

into Japan in middle 1960s. After one or two years of the introduction, poliomyelitis was not any longer endemic in Japan.

This fact suggests that, if infrastructure is well organized, high immunization coverage can be achieved. Only thing which program officer must concentrate is vaccine supply.

In the meaning, Indonesia can eradicate polio by the year 2000 (their national target) even if they do not have well-developed surveillance system or national laboratory network. Based on these data, the strategy, which have to be introduced in Asia, can be prioritized as follows;

They make possible to carry out following limited area containment immunization.

1) to develop simple guideline for the case definition
2) to train health personnels and to inform community residents
3) to develop prompt reporting system like using telegram
4) to install active surveillance team to health center or more upper level
5) to organize containment immunization team at least at district level

Laboratory Services

If regional reference laboratory is available, they do not have to use budget for national or provincial laboratory establishment. What we should consider is only to train people for specimen collection and transport.

This is my conclusion for the field study in Indonesia.

I would like to thank Indonesian government and JICA for their arrangement and cooperation. I also would like to recommend JICA to take next year polio year polio expert training here in Indonesia. Because based on the experience of this year, it would be managed better and would be more fruitful.

(2) Yasuhiko KAMIYA

Indonesia has been keeping systematic health service activity for the sake of all the children and people. Particularly, immunization activity is well established and organized based on both administrative structure and community voluntary activity. The success of this activity is mainly due to a remarkable community cooperation which we can recognize everywhere

and everyday during our stay in Indonesia.

As compared with the success of positive activity for the people, the negative or passive activity like a surveillance is probably one of weakpoints. Hospitals and private doctors are requested to be involved in the health program even more. In the case of Polio eradication in Indonesia, especially urban floating people are bigger problem rather than people in remote islands.

Finally, sincerely thank to the people who arranged and supported this field study.

(3) Akira SUTO

1) There is high level EPI in Indonesia.
2) PUSKESMAS - POSYANDYU system keep these high level EPI.
3) PKK assists POSYANDU system everywhere.
4) Nevertheless, it is difficult to expand immunization program for remote island where is far away from Java. They may need some help of Indonesian army.
5) Urban street people are increasing in Jakarta. How to immunize for these peoples?
6) They should use disposable needles and syringes to prevent from hepatitis B.

(4) Toshiro TAKEZAKI

There is already high coverage of OPV3 in Indonesia. I thought this high coverage is due to the development of well organized government system and brisk activities of community. We looked around many Puskesmas and Posyandus. The staff of those places are well trained and understand the importance of immunization. Further they have LAM system for the purpose of feedback rising coverage. They investigates not only absolute coverage rate, but also a trend of coverage in LAM to evaluate the program. I think it is very important to know the trend, because it is usually difficult to know the exact number of newborns.

Comparing with Brazilian way (mass campaign), it is very impressive that Indonesia chose the development of routine coverage at first. To succeed in the immunization program with Indonesian way, a well organized

government system is necessary. Indonesian way can develop public health at the same time, too. In this point of view, Indonesian way is recommendable for other countries in Asia.

It goes without saying that a good cold chain is needed to achieve a high coverage rate. It is very useful that I could look around cold chain system in a field.

There are still some problems in Indonesia: surveillance, laboratory services, urban floating people and a lot of remote islands. But I believe Indonesia will be able to succeed in polio eradiction.

At the end, I am extremely thankful to many Indonesian people and JICA officers for their help for this field study.

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