Table 6-7. Stool surveys of healthy children:

Dates of the survey	Location	# of children	Laboratory conducting analysis	Results	
				Polioviru s	NPEV*
1998		933	13	0	181
1997		964	16	13	167
1996		763	13	2	104

*Non polio enterovirus

7. Laboratory services and results

The Laboratory of Enteroviruses, Department of Virology II, National Institute of Infectious Diseases (NIID) (former National Institute of Health) is the National Polio Laboratory of Japan. The department has three other laboratories (Laboratory of Diarrhea Viruses, Laboratory of Hepatitis Viruses and Laboratory of Tumor Viruses). The organogram of NIID is illustrated in **Annex 7-1**.

The department was first established in 1961 by the name of Department of Enteroviruses, when the biggest outbreak of poliomyelitis occurred. Since then the laboratory has been functioning as the national polio laboratory both in virological surveillance as well as polio vaccine control and basic research laboratory for enteroviruses including polioviruses.

This laboratory has been WHO Collaborating Center for Virus Research and Reference (Enteroviruses). It has been designated as a Regional Reference Laboratory as well as Specialized Laboratory for the Global network on Polio Eradication Program of WHO. Furthermore, it is now the National Polio Laboratories for Cambodia and Laos, and was for North and South Vietnam. Samples from Mongolia are now divided into two and the half of them are now examined in NIID. Altogether about 800 stool samples in average per year were sent to NIID.

As a Regional Reference Laboratory, NIID had received annual proficiency tests in 1998 and 1999 for isolation /identification and ITD. The score was always 100%. It also got on site review from the head quarter from Geneva and the scores were 97% in 1998 and 98% in 1999, respectively.

The following table (Table 7-1) summarizes the specimens submitted from Japan for poliovirus studies since 1996.

Table 7-1

Year	AFP* case specimens	Specimens from AFP* contacts	Other stool specimens	Other clinical specimens	Environment specimens	Total
2000	2	0	2	0	2	6
1999	3	0	4	4	0	11
1998	10	1	4	5	14**	34
1997	5	0	8	5	2**	20
1996	1	0	19	7	7***	34

* in non-endemic countries where AFP surveillance cannot be established countries should report specimens from suspected poliomyelitis cases or contacts here (please specify if suspected poliomyelitis cases).

** actually submitted numbers of isolated polioviruses to NIID for intratypic differentiation

*** isolated from healthy children

In the following table, the results of ITD of Japanese samples are shown. The discrepancy of numbers with that of above table is sometimes one sample contain two types of polioviruses.

Table 7-2. ITD of polioviruses in Japan (1997-1999)

year	Poliovirus				
	Total	wild	Sabin 1	Sabin 2	Sabin 3
1997	23	0	8	10	5
1998	35	0	11	18	6
1999	11	0	5	4	2
Total	69	0	24	32	13

Summary tables of the results examined at NIID are illustrated **Annex 7-2** (1993-1999). The detailed results were published in the Laboratory and Epidemiology Communications in Jan.J.Infect.Dis. (**Annex 7-3, Annex 7-4**).

As mentioned above, the laboratory of Enteroviruses of Department of Virology II, NIID has been functioning as National polio lab for other countries in WPRO region. To show the laboratory function, the results of ITD test are summarized and shown in the following table (Table 7-3)

Table 7-3. Isolation of poliovirus from AFP patients (1997 – 1999)

Country	Year	Samples		Isolation (cases) of						
		specimens	cases	Poliovirus						Non-poliovirus
				Total	Wild (P1)	Sabin				
						Total	Sabin 1	Sabin 2	Sabin 3	
Cambodia	1997	348	177	22	8	14	5	4	5	48
	1998	341	175	12	0	12	2	5	5	83
	1999	296	149	4	0	4	2	0	2	46
Laos	1997	166	83	2	0	2	1	1	0	29
	1998	144	73	4	0	4	1	2	1	23
	1999	176	89	5	0	5	1	3	1	37
Vietnam	1997	471	253	24	1	23	5	10	8	71
	1998	634	320	10	0	10	3	6	1	98
	1999	69	32	9	0	9	3	4	2	1
Mongolia	1999	4	1	1	0	1	0	0	1	3
Korea	1999	1	1	1	0	1	1	0	0	0
TOTAL		**2650**	**1353**	**94**	**9**	**85**	**24**	**35**	**26**	**439**

8. Polio immunization activities

8-1. Brief description

The exact number of subjects requiring vaccinations and those actually vaccinated are reported by prefectures to the Ministry of Health and Welfare (MHW). Under this system, the prefectures calculate the exact number of subjects requiring vaccination based on basic resident registers kept by mayors and other heads of towns and villages. Vaccinations are usually given by private practitioners who have vaccination contracts with the municipalities. These practitioners report the number of vaccinations given to their municipalities and bill them. The municipalities then report to the MHW of the number of vaccinations given via the prefectural authorities. The MHW subsidizes half of the costs incurred to the prefectures based on the reported number of vaccinations given. The figures reported can be warranted to be highly precise and reliable as they involve enforcing budgets and delivery of subsidies.

The MHW holds regular meetings several times a year, gathering those in charge of vaccination in prefectures. The ministry makes use of this opportunity to call on prefectures with a low rate/number of vaccinated residents to raise the rate of vaccinations.

8-2. Routine immunization schedule

In its activities to promote vaccination amongst prefectures and citizens, the Ministry of Health and Welfare recommends that infants be inoculated with the polio vaccine between 3 and 18 months after birth. However, in consideration of infants who are unable to receive vaccination during this period for any reason, the ministry will allow a grace period of up to 90 months from birth to prevent them from not being vaccinated.

8-3. National immunization coverage table

National immunization coverage is always over 90 %. Routine immunization rates from 1987-1999 are summarized in the following table.

Year	Round	Vaccine used (OPV and/or IPV)	Target age group	Target population	No. of doses (i.e. OPV3)	Immunization coverage (%)
1987	1	OPV	3 ~ 48 months	1,416,000	1,314,086	92.8
	2	OPV		1,416,000	1,277,909	90.2
1988	1	OPV		1,360,000	1,260,837	92.7
	2	OPV		1,360,000	1,235,891	90.9
1989	1	OPV		1,312,000	1,244,245	94.8
	2	OPV		1,312,000	1,213,813	92.5
1990	1	OPV		1,259,000	1,203,536	95.6
	2	OPV		1,259,000	1,163,810	92.4
1991	1	OPV		1,212,000	1,167,193	96.3
	2	OPV		1,212,000	1,132,954	93.5

1992	1	OPV		1,212,000	1,183,095	97.6
	2	OPV		1,212,000	1,144,540	94.4
1993	1	OPV		1,217,000	1,138,926	93.6
	2	OPV		1,217,000	1,108,147	91.1
1994	1	OPV		1,193,000	1,135,318	95.2
	2	OPV		1,193,000	1,083,963	90.9
1995	1	OPV	3 ~ 90 months	1,170,000	1,188,371	101.6
	2	OPV		1,170,000	1,138,044	97.3
1996	1	OPV		1,190,000	1,186,649	99.7
	2	OPV		1,190,000	1,172,334	98.5
1997	1	OPV		1,190,000	1,120,273	94.1
	2	OPV		1,190,000	1,109,404	93.2
1998	1	OPV		1,200,000	1,153,952	96.2
	2	OPV		1,200,000	1,138,449	94.9
1999	1+2	OPV		1,250,000	1,235,084	98.8
2000	1	OPV			728,787	

8-4. Vaccine coverage rate per prefecture

Coverage rates per prefecture in 1997 and 1998 are shown in the following tables. Data are available for over 10 years but no significant changes noted (data for 1999 and 2000 are in **Annex-8-1**).

Polio immunization coverage by 1st administrative level

Year: 1997

1st Administrative unit	Target population	No. of Doses (i.e. OPV3)		Immunization Coverage (%)	
	Standard Immunization (3～90M)	1st round	2nd round	1st round	2nd round
Hokkaido	44,666	44,666	44,666	100.0	100.0
Aomori	17,442	14,146	13,676	81.1	78.4
Iwate	13,067	12,821	12,752	98.1	97.6
Miyagi	20,816	20,816	20,310	100.0	97.6
Akita	10,194	9,718	9,813	95.3	96.3
Yamagata	10,677	10,677	10,677	100.0	100.0
Fukushima	25,960	20,962	20,213	80.7	77.9
Ibaragi	30,273	28,809	27,930	95.2	92.3
Tochigi	15,951	15,951	15,951	100.0	100.0
Gunma	19,756	19,614	19,270	99.3	97.5
Saitama	65,275	65,275	65,275	100.0	100.0
Chiba	49,170	49,170	49,170	100.0	100.0
Tokyo	84,575	84,575	84,575	100.0	100.0
Kanagawa	81,231	81,251	80,332	100.0	98.9
Niigata	28,331	23,377	22,710	82.5	80.2
Toyama	10,291	10,157	10,096	98.7	98.1
Ishikawa	8,865	8,865	8,865	100.0	100.0
Fukui	7,765	7,765	7,765	100.0	100.0
Yamanashi	9,894	8,678	8,506	87.7	86.0
Nagano	18,132	18,132	18,132	100.0	100.0
Gifu	18,600	18,600	18,600	100.0	100.0
Shizuoka	34,039	34,039	34,039	100.0	100.0
Aichi	63,167	63,167	63,167	100.0	100.0
Mie	14,714	14,714	14,714	100.0	100.0
Shiga	13,046	13,046	13,046	100.0	100.0
Kyoto	20,306	20,306	20,306	100.0	100.0
Osaka	110,553	85,583	84,194	77.4	76.2
Hyogo	52,347	52,347	51,301	100.0	98.0

Nara	16,887	13,307	13,501	78.8	80.0
Wakayama	12,084	9,609	9,610	79.5	79.5
Tottori	4,324	4,324	4,324	100.0	100.0
Shimane	6,945	6,549	6,353	94.3	91.5
Okayama	22,006	19,755	18,517	89.8	84.1
Hiroshima	23,494	23,494	23,494	100.0	100.0
Yamaguchi	13,902	13,128	13,064	94.4	94.0
Tokushima	9,266	7,346	7,376	79.3	79.6
Kagawa	9,193	9,193	9,073	100.0	98.7
Ehime	13,045	13,045	13,045	100.0	100.0
Kochi	9,329	7,035	7,138	75.4	76.5
Fukuoka	41,497	41,497	41,497	100.0	100.0
Saga	10,576	8,728	8,458	82.5	80.0
Nagasaki	14,364	14,364	14,256	100.0	99.2
Kumamoto	17,886	16,960	16,428	94.8	91.8
Oita	13,070	10,980	11,330	84.0	86.7
Miyazaki	15,513	11,409	11,194	73.5	72.2
Kagoshima	19,191	15,153	13,975	79.0	72.8
Okinawa	22,922	17,170	16,720	74.9	72.9
Total	1,194,594	1,120,273	1,109,404	93.8	92.9

Polio immunization coverage by 1st administrative level

Year: 1998

1st Administrative unit	Target population	No. of Doses (i.e. OPV3)		Immunization Coverage (%)	
	Standard Immunization (3～90M)	1st round	2nd round	1st round	2nd round
Hokkaido	46,468	46,468	46,468	100.0	100.0
Aomori	16,069	13,744	13,378	85.5	83.3
Iwate	13,799	12,803	12,769	92.8	92.5
Miyagi	21,622	21,622	21,294	100.0	98.5
Akita	9,877	9,775	9,484	99.0	96.0
Yamagata	10,262	10,262	10,262	100.0	100.0
Fukushima	26,725	20,414	20,125	76.4	75.3
Ibaragi	30,483	29,130	28,204	95.6	92.5
Tochigi	16,598	16,598	16,598	100.0	100.0
Gunma	19,844	19,722	19,021	99.4	95.9
Saitama	65,771	65,771	65,771	100.0	100.0
Chiba	53,817	53,817	53,367	100.0	99.2
Tokyo	85,265	85,265	85,265	100.0	100.0
Kanagawa	70,812	70,812	70,812	100.0	100.0
Niigata	23,815	22,568	22,388	94.8	94.0
Toyama	11,508	10,206	9,901	88.7	86.0
Ishikawa	10,754	10,754	10,754	100.0	100.0
Fukui	8,532	7,955	7,720	93.2	90.5
Yamanashi	10,022	8,712	8,519	86.9	85.0
Nagano	20,275	20,275	20,275	100.0	100.0
Gifu	19,658	19,658	19,658	100.0	100.0
Shizuoka	33,676	33,676	33,676	100.0	100.0
Aichi	78,540	74,638	72,775	95.0	92.7
Mie	20,049	18,532	17,910	92.4	89.3
Shiga	14,263	14,208	13,653	99.6	95.7
Kyoto	24,123	23,852	23,081	98.9	95.7
Osaka	87,787	87,787	87,240	100.0	99.4
Hyogo	54,728	54,471	52,691	99.5	96.3

Nara	12,905	12,905	12,905	100.0	100.0
Wakayama	14,135	10,068	9,643	71.2	68.2
Tottori	5,208	5,208	5,208	100.0	100.0
Shimane	6,930	6,366	6,321	91.9	91.2
Okayama	24,065	19,191	18,491	79.7	76.8
Hiroshima	26,411	26,411	26,411	100.0	100.0
Yamaguchi	13,900	13,282	12,993	95.6	93.5
Tokushima	7,725	7,240	7,177	93.7	92.9
Kagawa	9,007	9,007	9,007	100.0	100.0
Ehime	18,820	13,620	13,510	72.4	71.8
Kochi	7,822	6,709	6,786	85.8	96.8
Fukuoka	46,636	45,881	43,667	98.4	97.9
Saga	9,510	8,929	8,586	93.9	90.3
Nagasaki	13,855	13,855	13,855	100.0	100.0
Kumamoto	18,956	17,106	16,651	90.2	87.8
Oita	11,879	11,081	11,000	93.3	92.6
Miyazaki	11,715	10,804	10,763	92.2	91.9
Kagoshima	19,792	16,245	15,297	82.1	77.3
Okinawa	18,578	16,549	15,119	89.1	81.4
Total	1,202,991	1,153,952	1,138,449	95.9	94.6

8-5. Serological surveillance

Polio-neutralizing antibody has been surveyed since 1962 in age groups; 0-1, 2-3, 4-6, 7-9, 10-14, 15-19, 20-24, 25-29, 30-39, and over 40. Each year 10 DPHLs are selected in turn and perform neutralizing antibody tests among randomly selected healthy individuals. In **Annex-8-2**, the data of 1996 are shown. Antibody titers to type 3 are generally lower than types 1 and 2.

8-6. Area of concern

The incidence of VAPP cases in Japan is 1-2 per year in these 20 years. This level is within the range of VAPPs as far as OPV is in use. Polio immunization is free but is not mandatory at present time. Vaccine coverage rates can be affected by hyper-reaction to VAPPs. Precise knowledge and understanding for polio immunization has to be kept and maintained.

9. Detection and response to importation of wild polioviruses

Poliomyelitis is designated as one of the six "second grade" diseases in new infection control law. If any patient is suspected for poliomyelitis the local public health emergency system will immediately start. The patient will be isolated to designated hospital and national committee will be immediately established. Guidelines are prepared and distributed to all medical facilities and public health organizations (**Annex 9-1**).

In June 2000, a 36-year old- father developed typical AFP with high fever. Later this patient was considered to be VAPP infected from his vaccinated daughter, but until laboratory data were completed, this case was considered to be wild case polio and treated as such. Epidemiological and virological active search was performed following the guidelines. Manuscript describing this case including sequence analysis is now in preparation. Detailed information and final results will be distributed upon request.

In the previous session, we described the isolation of wild polioviruses from toilets of airplanes arrived from wild polio endemic area. Wherever they are from, reservoirs of toilets are routinely examined by responsible DPHLs. All airline companies are requested to treat the contents by chlorination and ozonization, following the WHO guideline before they are released to domestic sewage systems.

In Japan, about 3.5 million doses of OPV are prepared annually. Half of them are used for routine immunization. The other half is for non-routine immunization, for example, travelers or additional immunization upon request. Usually more than one million doses are kept for "emergency" cases and they are renewed every year.

10.Areas of special concern

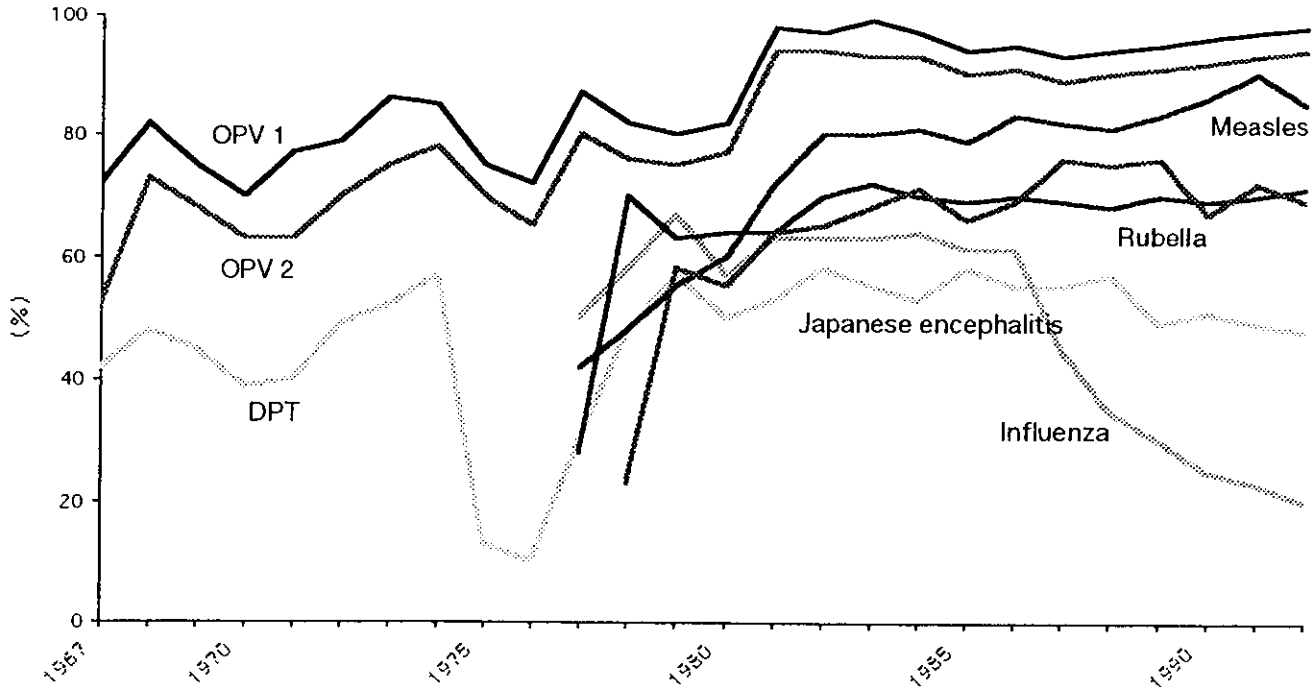
Two concerns, one is the importation from still endemic countries. Geographically Japan has neighboring countries with wild polioviruses. Traffics to and from African countries are more efficient than any other Asian countries. Incidental isolation of origin unknown wild polioviruses from non-polio patients raises special concern. Children from foreign countries receive routine OPV immunization in the same manner as Japanese.

The other is OPV derived revertant. Pathogenic revertant vaccine strains can be excreted to environment, and be a possible source for secondary infection. Direct secondary infection from a vaccinee to an unimmunized adult was recently shown. However, to date, in spite of the rather high frequency of appearance of revertant viruses, the frequency of such vaccine associated- cases is low.

Only method to deal with these concerns is to keep high community level immunity. J-NCC has now additional terms of reference, that is to set up national polio control strategy after wild poliovirus - free status declaration.

So far high level of OPV coverage has been maintained. However, like other developed countries, there is some skepticism to vaccines in general. As shown in the following figure, exceptionally high level of OPV coverage compared to other viral vaccines (for example measles, influenza etc) is sustained. This is based upon public consensus for efficacy and safety of OPV. Low incidence of VAPPs in Japan may affect this confidence in OPV.

Vaccine coverage rate



Wild polioviruses kept and used for experiments in virology laboratories (academic and diagnostic) are generally adequately handled in P2 facilities and will be easy to be registered. However, there are uncountable amounts of stool specimens collected in polio endemic countries for various different purposes. Those stool specimens kept in non-virological laboratories in Japan seem to be very difficult to be controlled.

11. Post polio free activities for sustainability

Nation wide polio surveillance backed up laboratory net work is continued. Poliomyelitis is still designated as second grade infectious diseases and will be responded as such.

Other activities like enterovirus surveillance will be kept. The government started a working task force group for new vaccination strategy in Japan. This will be the solid committee for the polio control in Japan after polio free declaration. Adoption of IPV is seriously considered. The key point is how to keep the high level immunity to polioviruses.

The Centers for Disease Control and Prevention's (CDC) Epidemic Intelligence Service in the United States has had 50 years of experience in training public health epidemiologists. The European Union started a similar training program, European Program for Intervention Epidemiology Training (EPIET) in 1995. The Japanese equivalent, FETP-Japan, was established and started its function in September 1999. This section at NIID has a task force of training experts for active epidemiological and virological surveillance. Non-polio enterovirus infection for example, EV71 is targeted.

12. Containment of wild poliovirus infectious/potentially infectious materials

In accordance with the resolution of the World Health Assembly held in May 1988, strategies are presently being promoted to eradicate polio (poliomyelitis, acute anterior poliomyelitis) on a global scale. Thanks to efforts focusing on surveillance and immunizations in the WHO Western Pacific Region, there have been no cases of indigenous wild polio reported since March 1997, when a girl was found to be infected in Cambodia. If no further indigenous cases are reported, WHO is planning to declare the WHO Western Pacific Region free of the wild poliovirus in autumn 2000.

The final polio eradication phase aims to contain the wild poliovirus kept by laboratories for the purpose of tests and research. WHO has been calling on the governments of member countries to ensure thorough containment of the poliovirus at institutions and organizations (hereafter referred to as "laboratories, etc.") which may be keeping the poliovirus in their countries.

As the first step of its efforts in this global polio eradication initiative, the Ministry of Health and Welfare of Japan has disseminated the importance of the containment of the wild poliovirus or specimens and samples (hereafter referred to as "specimens, etc.") that may contain the wild poliovirus to laboratories, etc. in Japan, and conduct a survey on the storage state. (**Annex 12-1**)

12-1.Provisional schedule on containing wild poliovirus

A. Disseminating the purpose of the wild poliovirus containment initiative should be ensured and list of facilities, institutions, etc. that possess wild poliovirus compiled (by October, 2000)
   a) Establish a post-polio eradication affairs preparation committee: early July
   b) Briefing by Ministry of Health and Welfare to related governmental authorities: mid July **<Annex 12-2>**
   c) Sending notification (on ensuring the disseminating purpose of wild poliovirus containment initiative and the survey of storage conditions) by related governmental authorities to the institutions, organization, etc. concerned late July (**Annex 12-1**)
   d) Setup of a website for thoroughly disseminating the purpose of the wild poliovirus containment initiative. early August (**Annex 12-3**)
   e) Setup of a website for surveying storage conditions mid August
   f) Deadline for response to the storage conditions survey mid September
   g) Compilation of summary and list on storage conditions survey results late September
   h) Report to WPRO late October
   i) Establish a post-polio eradication affairs committee November

B. Verification of Storage Conditions Details (by the end of 2001)
   Secondary surveys will be conducted on institutions and organizations that have responded

Affirmatively to the survey on storage conditions to verify detailed storage conditions.

C. Implement thorough destruction (2002 to 2003)

D. Verify states of destruction (by the end of 2004)

E. Complete destruction (2005)

12-2. Head of national taskforce coordinator

J-NCC assigned Dr.Hiroki Nakatani as the coordinator for this containment survey. Director, Infectious Disease Control Division, Health Service Bureau, Ministry of Health and Welfare

12-3.Notice to the authorities concerned

"Containment of the wild poliovirus" process described above is summarized as follows; The Ministry of Health and Welfare shall first explain to the authorities concerned about the details of the containment initiative, the related authorities shall then send a notice on thorough disseminating of the purpose of the wild poliovirus containment initiative and survey of storage conditions to related institutions and organizations (**Annex 12-1**). The replies from the institutions and organizations involved shall be collected and reported by the authorities concerned. (The solicitation and collection of replies via the Internet is currently being considered.) The results of the survey shall be summarized by the Infectious Disease Control Division, Health Service Bureau, Ministry of Health and Welfare and National Institute of Infectious Diseases. (**See diagram of Annex 12-2)**

12-4.Findings and results of activities so far.

As of July 20, 2000 the following list is obtained. Details on which authorities and isntitutions contacted are available

List of Wild Polio Viruses

Name	Affiliation	Strain
Dr. Akiko Nomoto	Department of Microbiology, University of Tokyo	Type I Mahoney Type II MEF-1 Type III Leon
Dr. Yoshiko Hasegawa	Infectious Diseases Surveillance Center, NIID	isolates from Pakistan
Dr. Kyoko Konishi	Department of Viral Disease and Vaccine Control, NIID	Type I Mahoney Type II MEF-1 Type III Suwa Strain
Dr. Bo Ami	Division of Experimental Animal Research, NIID	Type I Mahoney Type III Suwa Strain and ts mutants of Suwa Strain
Dr. Noriyo Nagata	Department of Pathology	Type I Mahoney Type II Lansing
Dr. Kenji Sakae	Aichi Prefectural Institute of Public Health	
Dr. Tetsuo Yoneyama	Laboratory of Enteroviruses, Department of Virology II, NIID	Field isolates from; Cambodia (1992-1997) China (1983-1999) Japan (1960-1993) Laos (1996) Mongolia (1982-1994) Pakistan (1990-1991) Philippines (1992) Viet Nam (1992-1997) Type I Mahoney Type II MEF 1, Lansing Type III Saukett, Leon, Suwa
Dr. Satoshi Koike	Department of Microbiology, Tokyo Metropolitan Institute for Neuroscience	Type I Mahoney

12-5.Comment on regular future updates until global certification is achieved

J-NCC will report annually to RCC on the real time registration status.

13. Conclusions and recommendations

In Japan, wild polioviruses have not been detected since the last type 1 polio case in 1980. Transmission of wild poliovirus is completely interrupted since then. Types 2 and 3 were eradicated much earlier. Good sanitation, establishments of good laboratory practice and nation wide surveillance system back up the above conclusion.

Alert to importation should be emphasized. To sustain the high quality polio control system in Japan is necessary. To maintain high vaccine coverage is also essential. National level wild polio search has started.

14. Annex list

Annex 2-1: criteria for differential diagnosis of poliomyelitis

Annex-2-2: Investigational record of patients with poliomyelitis-like diseases

Annex-2-3: Site of regions participated for supplementary AFP surveillance

Annex-2-4: Institutions and responsible doctors for supplementary AFP surveillance

Annex-5-1 Hara et al., Microbiol. Immunol. 27, 1057-1065, 1983.

Annex 5-2 Yoneyama et al., Jpn.J.Med.Sci.Biol. 48, 61-70, 1995.

Annex-6-1 47 DHPLs

Annex 6-2 Investigational report of patients with poliomyelitis-like diseases

Annex 6-3. Extensive polio survey since 1998

Annex-6-4. Tokunaga report

Annex 6-5. Line listing of AFP cases by retrospective surveillance.

Annex 6-6 Line listing of compatible AFP cases by prospective study 1999-2000

Annex 6-7 Locations of DHPHs in map

Annex 6-8 Results of enterovirus surveillance

Annex 6-9. Akiyama et al. Jpn.J.Infect.Dis.52, 179, 1999.

Annex 6-10 Summary of environmental study

Annex 7-1 The organogram of NIID.

Annex7-2 Summary of results tested samples and ITD in NIID.

Annex 7-3, Yoneyama et al. Jan.J.Infect.Dis. 52, 19-20, 1999.

Annex 7-4. Yoneyama et al. Jan.J.Infect.Dis. 53, 90, 2000.

Annex 8-1. OPV coverage rates per prefecture in 1999 and 2000.

Annex8-2 Polio neutralizing antibody by age group

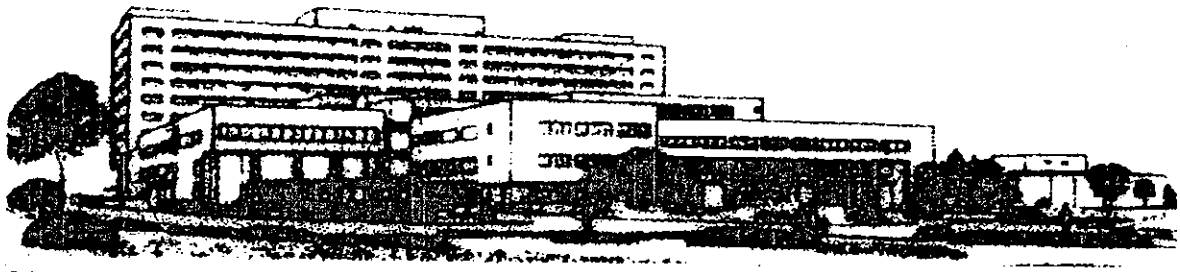
Annex 9-1 Poliomyelitis as a "second grade" infectious disease in new Infection control Law

Annex 12-1. Distributed documents from MHW "Containment of wild poliovirus in laboratories for global polio eradication"

Annex 12-2. Procedure for conformation of possesion of wild poliovirus specimens.

Annex 12-3. Website for Wild poliovirus registration

Annex 2-1



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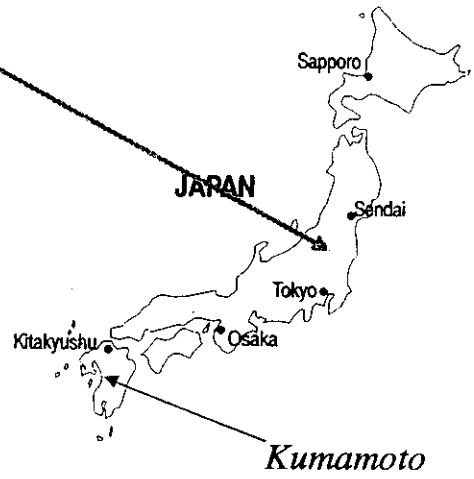

DIFFERENTIAL DIAGNOSIS OF ACUTE FLACCID PARALYSIS (AFP)

An introduction for EPI Staffs and Those Responsible for Polio Eradication

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Introduction

This manual has been written through the experience of the author who has had unusual opportunities to observe many children suffered from diverse paralytic disorders in China. The major experience includes those cases of poliomyelitis in Shandong Prefecture during 1991-95 periods. Also, I have added recent experiences in Yunnan and Shinjan Provinces in 1995-9.

The clinical diagnosis of poliomyelitis depends largely on clinical neurological impression, virus isolation and epidemiological assessments. However, laboratory virological studies require at least a few weeks to obtain results and thus are not suited for prompt actions and for those who are directly dealing with regional EPI and patient care. Moreover, clinical differentiation of polio from AFP (acute flaccid paralysis) of other causes is of importance for the epidemiological surveillance of the region and country.

Clinical diagnosis of poliomyelitis is *to differentiate non-polio paralytic disorders from "true" polio.* There are a variety of disorders in children, which are listed in the category of AFP by Ministry of Health of China. Here, the manual describes several more important disorders among many listed and its differentiation.

It is noteworthy that clinical differential diagnosis of AFP is of ever-increasing importance in China as the outbreaks of polio has been largely controlled and the polio cases have been converged into very small numbers in each province and during 1996 surveillance there has been no domestic case of poliomyelitis with wild polio virus isolation. A case of clinically definite polio thus implies it be a case by a wild polio strain or vaccine-related. If there were a single case of polio by a wild strain identified, things would be very much different with regard to the polio-eradication strategy of a country. This did occur in November 1999, when two children were discovered to have wild strain poliovirus in a same village after several years without recovery of wild virus throughout China. In order for better understanding of AFP, a brief introduction of basic neuroanatomy and physiology are first described and then several clinical categories of AFP will be explained in order.

I. Neuroanatomy and Physiology of the Motor System

The volitional motor activity starts at the motor cortex of the cerebral hemisphere (frontal lobe) that is contralateral to the side of motor execution by the limbs. The motor cortex (area 4 of the Broadmann's cortical map) contains a large number of giant pyramidal-shaped cells that serve the first order (upper) motor neurons. The long axons descend from the cortex to the brainstem and cross to the contralateral side at the level of the medullary pyramid (Fig 1). Then, the axons further descend to the spinal cord where those axons responsible for the upper limb movements merge into the anterior horn gray matter at the cervical spinal cord enlargement. Those fibers destined to support the lower limb movements further descend to the lumbar enlargement and merge into the anterior horn at the corresponding level.