SEA-Immun-43
Distribution: General

Joint National/International Acute Flaccid Paralysis (AFP) Surveillance Review (Indonesia)

The Report
21 July – 3 August 2006

World Health Organization
Regional Office for South-East Asia
New Delhi, January 2007

CONTENTS

Page

Executive Summary

Key findings

- The review team recognizes the extraordinary challenges (tsunamis, earthquakes, volcanoes, avian influenza, polio outbreak) recently faced by the people and the Government of Indonesia. In spite of these national calamities, Indonesia remains committed to the national and global polio eradication effort and has vigorously combated the polio outbreak following importation of wild poliovirus and joined with partners to implement supplementary immunization activities (SIAs) and National Immunization Days (NIDs) throughout the country. Indonesia should be commended for effecting improvements in the oral polio vaccine (OPV) coverage which has increased with each subsequent NID round.

- At the national level, Indonesia currently meets the minimum surveillance quality indicator of two non-polio acute flaccid paralysis (AFP) cases per 100 000 children under the age of 15. Its laboratory system for testing specimens is also working well. However, adequate specimen rates are borderline, at the sub-national level the sensitivity of AFP case detection and reporting is variable and frequently sub-optimal, and delays in reporting are evident. Given enough reported AFP cases, an outbreak in Indonesia would eventually be detected. However, to mount an early and massive response, it is critical to detect the first cases in the chain of transmission. The ability to rapidly detect wild poliovirus or circulating vaccine derived poliovirus (cVDPV) is currently inadequate.

- At the time of review, the Joint National/International AFP Surveillance Review Team could not conclude with confidence that wild poliovirus (WPV) transmission has been interrupted in Indonesia. As recently as April 2006, there was confirmed isolation of wild poliovirus (WPV) in healthy contacts in Aceh province. Only one round of supplementary immunization activity was conducted at the time of the April 2006 isolation. The conditions which put Indonesia at high risk for the polio outbreak, i.e. the threat of WPV importation and inadequate routine immunization coverage in some areas, still exist.

- There has been obvious progress in curtailment of the 2005 outbreak. However, once zero polio-status is reached again in Indonesia, considering the low immunization coverage and risk of importation, it is unlikely to be maintained without aggressive preventive SIAs. The establishment of a technical advisory committee for polio eradication and immunization to guide programmatic action will assist the government in devising appropriate policies to reach and maintain polio-free status in Indonesia again.
- It was not apparent to the review team if surveillance is a priority in Indonesia's health system. When surveillance of diseases and conditions of national importance, not only AFP but also other conditions such as measles, other vaccine-preventable diseases, and avian influenza is high priority, it should be apparent at all levels of a health system.

Recommendations

Surveillance structure

National

- The high priority for surveillance must translate into appropriate human and other resources for the national, provincial and district levels. The most critical need is to strengthen the national surveillance unit and the WHO surveillance team with sufficient human and other resources devoted to AFP surveillance, so that the central monitoring and supervision function can be fulfilled. The terms of reference (TORs) of the Communicable Disease Control (CDC,) National Surveillance Coordinators and WHO counterparts should be revised accordingly, and emphasis should be placed on field supervision, using detailed checklists.
- To prioritize provinces (and districts within provinces) for follow-up, the CDC/MoH with WHO assistance should determine which provinces have sub-optimal surveillance performance (i.e. non-polio AFP rates < 2 per 100 000 children less than 15 years of age, stool collection rates < 80%, silent areas, provinces with OPV3 coverage < 90%, etc.) and devise a plan for remedial action within the next three months.

- To ensure that all Surveillance Officers (SOs) can devote sufficient time to AFP surveillance, the CDC/MoH in collaboration with WHO should investigate the feasibility of placing the SO system directly under the central level (for example, paying their salaries, etc); this may facilitate better coordination, uniformity of performance, and setting priorities for SOs.
- Within the next two months, to more closely monitor the performance of AFP surveillance, CDC National Surveillance staff (with WHO's support) should develop a routine system (e.g. weekly data analysis, monthly review meetings) for identifying problem issues early (e.g. decrease in surveillance sensitivity, silent areas). This system should result in proactive steps to solve problems and resolve issues before they become chronic.
- To ensure high-quality and more uniform active surveillance within hospitals, Standard Operating Procedures (SOPs) should be developed within the next three months and implemented. These SOPs should include outpatient clinics, in addition to inpatient wards, in the standard reporting network. Reporting staff, training requirements, and active surveillance guidelines should also be described in the procedures.
- The Government of Indonesia acknowledges that Banten and Aceh provinces are high-risk areas. However, it also admits that it has limited human resources, and that it would therefore need additional support to strengthen surveillance in these provinces.

Province

- To ensure AFP data are regularly reviewed and challenges identified and addressed, regular and, at a minimum, quarterly analysis of data and review meetings should be held at the province level, chaired by the provincial chief of health. These meetings should include key stakeholders from districts and relevant CDC programmes to review the data for decision-making and setting priorities.
- To increase the sensitivity of AFP surveillance, orientation sessions for hospital physicians (especially pediatricians and neurologists) and private providers should be conducted at least every six months. These sessions should be held within the hospital to ensure that

physicians can attend, and should be conducted by senior physicians (for example, retired professors of pediatrics or neurology) to ensure complete attention and a common working language between physicians. Each province should prepare a plan of action for hospital orientation sessions, with the aim of conducting one session in each priority hospital in the next 6-12 months.

District

- To ensure that surveillance activities are more systematic, more than one staff should be assigned for surveillance duties in priority areas. Back-up staff should also be well trained to take over routine tasks when the primary surveillance officer is absent.
- To ensure more uniform surveillance knowledge, district and sub-district (*puskesmas*) surveillance staff should receive general and AFP-specific surveillance training. The district health centre staff and health officers should also receive general surveillance training with special emphasis on how to use information for planning. Medical staff in most hospitals should also receive focused AFP and general surveillance training with periodic refresher training.

Surveillance officers

- Since the Surveillance Officers in the provincial health department is vital to AFP surveillance in Indonesia, it is critical to devise a system that routinely monitors the performance of these Surveillance Officers, detects problems early, and institutes remedial action as soon as possible. The terms of reference (TORs) should be reviewed and reflect the latest updates and should include integrated VPD surveillance, active case-finding at priority sites, assisting district SOs with case investigations, monitoring district-level surveillance activities, socialization and training of district and sub-district level staff and dissemination of information to all field staff within the next three months.
- To continue building strong surveillance systems, the CDC National Surveillance Coordinators with support from WHO should meet regularly (every three months) with provincial surveillance staff to establish priorities and review work plans, active case visits, case

investigation forms, data analysis, immunization coverage, reporting networks, travel logs and trip reports, appropriate level of field work and training requirements. National Surveillance Coordinators should verify zero reporting and periodically reinvestigate AFP cases for validation and quality assurance. Activities of provincial and national surveillance officers should be verified by respective supervisors and appropriate documentation of visits maintained at all levels.

Surveillance systems

- To ensure that the latest surveillance and programmatic information is available to surveillance staff, the current Guidelines for AFP surveillance (edition 2003) should be revised and expanded to reflect the latest global strategies and requirements for active surveillance.
- Standard operating procedures (SOPs) for active surveillance (case searches) in hospitals and health centres should be developed and disseminated to surveillance focal persons at all levels within the next three months. These searches should be monitored regularly with appropriate documentation by supervisory staff.

Surveillance reporting culture

- To further increase the sensitivity of case detection, reporting networks should be expanded to include private practitioners, traditional healers, community midwives, community volunteers, and local leaders where necessary. Socialization of AFP and other disease surveillance activities should be conducted periodically in local communities.

Surveillance performance

- At all levels, surveillance officers should analyse province and district-level data routinely. Special attention should be paid to under-performing areas through the standard surveillance indicators and proactive and corrective action initiated. Routine analysis of surveillance performance should be completed and disseminated as feedback to all levels of the health system.

Surveillance data management

- To ensure more uniform performance, the national data management unit should develop written data management guidelines, and back-up and operational procedures that can be shared with provinces. These should include trouble-shooting strategies for basic data management issues, coding, data dictionaries, acronyms or programmes for standard reports, and a list and guide to solve common errors.
- A standard, transparent, and uniform method of data collection, transmittal, and reporting should be streamlined, strengthened, and implemented uniformly in provinces and districts. Routine feedback reports on data problems and data quality issues, including timeliness and completeness, should be provided to provinces and districts. Areas with chronically late or incomplete reporting should receive special training and assistance to improve their reporting.

Integration of vaccine-preventable disease surveillance

- Although the reporting of measles and NNT is part of the integrated disease surveillance system, there is little programmatic action following the reporting of cases or outbreaks. Guidelines for programmatic action following detection of cases or outbreaks of measles, or cases of NNT should be updated, disseminated widely, and used.

National polio and measles laboratories

- To ensure timely sequencing of poliovirus isolates, National Polio Laboratory (NPL) Bandung should refer all wild polio isolates and those showing discordant Intratypic Differentiation (ITD) result at the earliest (within seven days) to the Global Specialized Laboratory (GSL) for sequencing. Issues that restricted referring isolates to the GSL for sequencing (Government of India clearance and identifying a courier service) have been sorted out. These should be monitored and any delays resolved quickly**.**
- Any change of EPID numbers should be communicated to the NPL and the GSL by the surveillance programme and should be resolved before the laboratory results are submitted to the programme.

- For measles laboratories, the inventory of consumables and kits should be maintained and procurement of kits should be streamlined and initiated early to avoid delay in testing. Any anticipated delay should be brought to the attention of the WHO Regional Laboratory Coordinator in advance.

National Certification Committee

The National Certification Committee (NCC) should meet at least on an annual basis.

- The membership of the NCC should be reviewed by the CDC/MoH and WHO jointly to determine which members are active and which members are inactive. Active members should be retained, and inactive members should be replaced. A list of possible replacement candidates should be compiled and provided to the Minister of Health for possible appointment.

National Expert Review Committee

- The CDC/MoH and WHO should jointly review the membership of the National Exert Review Committee (NERC), and retire inactive members, and propose replacement candidates for committee membership, as appropriate, to the Minister of Health for possible appointment.
- The AFP case investigation form should be reviewed, and revised as appropriate, to ensure that the basic clinic information on AFP cases is included. In addition, if an AFP case is investigated, and it is apparent that no adequate specimens have been collected, the programme should ensure that hospital records, especially discharge summaries, should be attached to the AFP case report, and made available to the NERC to assist in their classification efforts.

Plan of action for responding to polio outbreak

- Indonesia's Plan of Action (PoA) for Responding to a Polio Outbreak should be reviewed, updated and disseminated to all health system levels and the latest recommendations from the World Health Assembly resolution (26 May 2006) included therein. In line with the

Resolution of the 117 Executive Board of WHO, the PoA should include large, responsive mop-ups in the event of additional cases or new importations.

- Since the last SIA was conducted during the time when the last wild poliovirus type 1 was detected in a contact in south Aceh province, the POA should include an aggressive plan to carry out SIAs. This should include giving OPV during other immunization opportunities such as measles campaigns and specifically targeting the upcoming measles campaigns in Sumatra (including Aceh and North Sumatra at the same time) and Java. Taking into account the epidemiological data, the Government of Indonesia may wish to consider two rounds of NIDs in 2007.
- To better advise the MoH on programmatic issues for polio eradication and immunization, a technical advisory group (TAG) consisting of national and international experts should be established and convened regularly.

Routine immunization

- The highest priority is to confirm reported routine immunization coverage by province through surveys, and map low-coverage areas in each province, in order to allow targeting these low-performing areas for intensified follow-up activities.
- Regular monthly tracking and review of progress in immunization coverage and drop-out rates should be implemented at all hospitals and health centres.

Follow-up

- Given the importance of these recommendations to the Global Eradication Programme, the CDC in collaboration with WHO should develop a plan of action for implementation of recommendations, documentation, monitoring, and follow-up within the next three months.
- The WHO South-East Asia Regional Office (SEARO) should follow up on the status of recommendations of the review after six months.

1. Background

1.1 General

The Republic of Indonesia is a large and diverse country consisting of over 17 500 islands. It is located between 6 degrees north and 11 degrees south latitude, and from 95 to 141 degrees east longitude. The Indonesian archipelago lies between Asia and Australia. It is bounded by the South China Sea in the north, the Pacific Ocean in the north and east, and the Indian Ocean in the south and west. It has international borders with Singapore, Malaysia, Timor-Lesté, Philippines, Papua New Guinea and Australia.

There are five major islands: Sumatra in the west; Java in the south; Kalimantan straddling the equator; Sulawesi; and Irian Jaya or Papua bordering Papua New Guinea on the west. The two remaining groups of islands are Maluku and Nusa Tenggara, running from Sulawesi to Papua in the north and from Bali to Timor in the south. Other islands are small and mostly uninhabited. More than 80% of Indonesia's territory is covered with water; the land area is about 1.9 million square kilometers. Indonesia's climate is tropical with two seasons. The dry season extends from May to October, and the rainy season from November to April. The large number of islands and their dispersion over a wide area has given rise to a diverse culture and over 250 ethnic and tribal groups, each with its own language. Muslims make up the majority of the population at 87%, with Christians 9% and Hindus 2%.

The total population in Indonesia in 2005 was 219 141 800 with 61 878 400 (28.2%) children under 15 years of age. This makes Indonesia the fourth most populous country in the world after the People's Republic of China, India and the United States of America.

The population is not equally dispersed among the islands. Almost 60% of the population live on the island of Jawa, 21.2 % in Sumatra, 5.5% in Kalimantan, 7.1% in Sulawesi and the rest (6.2%) in other islands. The

2000 Population Census indicates that the population density varies not only across islands, but also among provinces of the same island. Jawa, which covers only 7 % of the total area of Indonesia, is inhabited by 60 % of the country's population, making the population density of Jawa (951 persons per square kilometer) higher than that of other islands. By comparison, Kalimantan has a density of 20 persons per square kilometer. Within Jawa, the population density ranges from 12 700 persons per square kilometer in DKI Jakarta to 726 persons per square kilometer in East Jawa. The population density at the national level was 109 persons per square kilometer in 2000, and was estimated to be 112 persons per square kilometer in 2002.

Administratively the country consists of 33 provinces and 441 districts/cities. The next lower administrative units are sub-districts and villages. In 2002, there were 4 918 sub-districts and 70 460 villages in Indonesia. Villages are usually classified as urban or rural.

In 1999, Law Number 22 on Regional Development was enacted. The law gives full autonomy to districts (Kota/Kabupaten). With some exceptions, the same law also makes the local government responsible for all "de-concentrated" Central Government ministries at the province and district levels.

1.2 Health system

The health system of Indonesia comprises provincial referral hospitals, private hospitals, district hospitals and health centres (*puskesmas*), nursing homes, primary health care centres, and sub-district health posts (*posyandus*). At the sub-district health centres, female community health volunteers are the key component of local health care delivery.

1.3 Immunization

EPI Programme

Indonesia started the Expanded Programme on Immunization (EPI) in 1979. The goal of the EPI programme is to reduce morbidity and mortality associated with vaccine-preventable diseases.

Polio eradication

The health infrastructure, under which polio eradication initiative is managed, is well established. The division responsible for polio eradication in the Ministry of Health is the sub-Directorate of Surveillance, under the Directorate of Epidemiology, Immunization and Matra Health, which is under the Directorate-General of Communicable Disease Control and Environmental Health.

Indonesia joined the global polio eradication initiative in 1995, with implementation of supplementary immunization activities throughout the country. See Table 1 for the history of key events in polio eradication in Indonesia. The process of certification was started in 1998 with establishment of the National Certification Committee (NCC). The NCC draft country report was reviewed and accepted by the Regional Certification Commission, the International Certification Commission for Polio Eradication in the SEA Region (ICCPE), in March 2005. The NCC meets at least once in a year. It met four times in 2005. However, it has not met since 2005. The country also established a National Task Force on Laboratory Containment in 2001. Similar task forces were also established in every province. A nationwide survey to identify all biomedical laboratories that might possess poliovirus infectious or potentially infectious materials was conducted in 2002-2003 with a 100% return rate for the questionnaires distributed. An independent National Expert Committee (NEC) reviews all AFP cases with inadequate stool.

Prior to the recent poliovirus outbreak in 2005, the last case of indigenous paralytic poliomyelitis was reported on 23 June 1995 in Probolinggo, East Jawa. The virus identified was wild poliovirus type 1. However, the last wild poliovirus was isolated on 15 October 1995 from a contact of a suspected polio case in Medan, North Sumatra. The virus isolated was wild poliovirus type 3. Since then, no wild poliovirus was detected until the importation in 2005.

In 2005, Indonesia experienced an outbreak from an imported virus from Sudan with origin in northern Nigeria. Because of the low routine immunization coverage, the virus spread to 47 districts in 10 provinces. A total of 305 (303 in 2005 and two in 2006) wild poliovirus cases have been attributed to this outbreak. In addition, and separate from the wild poliovirus outbreak, Indonesia was also confronted with an outbreak of

circulating Vaccine Derived Poliovirus (VDPV) in four districts on Madura island in East Java province. In total, 46 VDPVs were reported in 2005. These outbreaks highlighted the gaps in AFP surveillance and immunization coverage in Indonesia. The district in West Java where the virus was initially identified had reported OPV3 coverage of over 95% in 2004. In Banten Province, from where the majority of wild poliovirus cases were reported, the reported administrative OPV3 immunization coverage in 2004 was 87%. The onset of the most recent wild polio case occurred on 20 February 2006 in Aceh Tenggara, Aceh Province.

There is significant movement across borders within the Region (Thailand, Myanmar, Timor-Leste) and with countries in the Western Pacific Region (Malaysia, Philippines, Papua New Guinea, Australia) increasing the risk for spread of the virus to other polio- free countries.

Prior to the 2005 outbreak, National Immunization Days (NIDs) were conducted in 1995, 1996, 1997 and the last one in 2002. The target population was children under five years of age and approximately 20 million children were reached in each round. The coverage of NIDs was reported at 100%. Supplementary immunization activities (SIAs) were also conducted in 1998, 1999, 2000, 2001 and backlog fighting (i.e. recalling immunization defaulters from the previous three years) was conducted in 2001.

Table 1. *History of poliomyelitis eradication in Indonesia*

1973	Immunization programme introduced in Indonesia with BCG
1974	Immunization expanded to include TT
1976	DTP added to the immunization schedule
1977	EPI Programme initiated using WHO Global Immunization Guidelines in 55 *puskesmas*
1977	EPI Basic Guidelines developed for Indonesia
1981	OPV was added to the EPI Programme's list of antigens
1982	Measles vaccine was added to the EPI Programme
1988	The World Health Assembly and Indonesia committed to eradicate polio
1991	Polio Eradication Programme started and "suspect polio" surveillance initiated
1995	First National Immunization Days (NIDs) initiated

1995	Last indigenous wild poliovirus Type 1 reported from Probolinggo, East Jawa
1997	Polio Eradication program expanded to AFP Surveillance
1997	Three national polio laboratories accredited
1997	1st International AFP Surveillance Review December 1997
1997	National Committee for Certification of Polio Eradication established
1998	National Expert Review Committee established
1998	PT Biofarma lab begins ITD testing
2001	National Task Force on Laboratory Containment formed
2002	WHO supported Surveillance Officer system initiated
2002	National Polio laboratory in Bandung upgraded for ITD testing
2003	The Integrated VPD Surveillance Field Guide updated to include measles and NT
2003	2nd International AFP Surveillance Review completed in June 2003
2004	AFP, Measles, NT Integrated Surveillance
2004	Environmental sampling for poliovirus started in Yogyakarta Province
2005	Wild poliovirus type 1 reported from Sukabumi on 21 April 2005
2005	Vaccine derived polio virus outbreak (VDPV) detected on the island of Madura

As of 11 July 2006, 703 AFP cases have been identified and 681 stool samples tested (679 from AFP cases and 2 from healthy contacts). Results are available for 555 AFP cases of which 2 have wild poliovirus Type P1. Type P1 wild poliovirus was also isolated from one of the two healthy contact specimens from Aceh province.

Indonesia committed to eradicate poliomyelitis by adopting the recommended strategies of the World Health Organization. These strategies include:

- Establishing high quality surveillance for acute flaccid paralysis (AFP),
- Achieving high routine OPV3 coverage,
- Conducting supplemental immunization activities (SIAs).

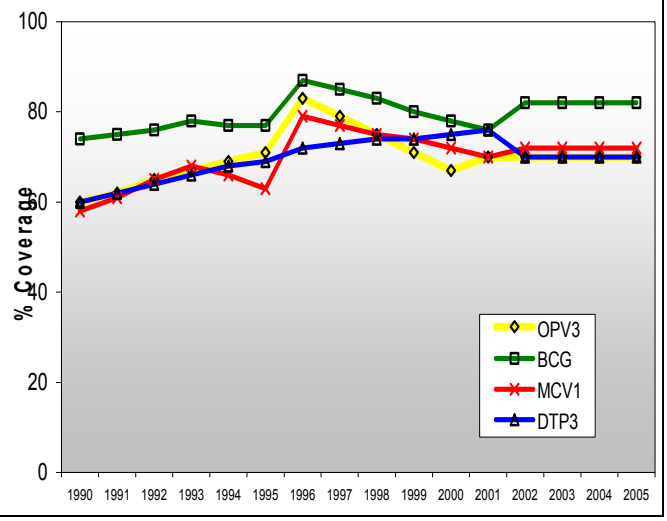
- Establishing high-quality surveillance for acute flaccid paralysis (AFP): AFP surveillance was started in 1997. Reporting units from government hospitals to sub- district health posts conduct zero weekly reporting. See remainder of the report for more details.

- Achieving high routine OPV3 coverage: Since Indonesia introduced Oral Polio Vaccine (OPV) in 1981, it has been an integral part of the routine immunization program throughout the country. In the current schedule polio immunization is given 4 times to each child in one month intervals with the first dose given to an infant immediately after birth. However, OPV3 remains as an indicator of coverage. Immunization services are provided through hospitals, health institutions, private hospitals, and outreach clinics. According to WHO/UNICEF estimates, the OPV3 national coverage rose steadily during the 1990's and has been stable at around 70% since 2001. See Figure 2 for a summary of the WHO/UNICEF estimated immunization coverage since 1990 for four antigens.

Figure 1. ***WHO/UNICEF estimated immunization coverage in Indonesia***

Percent Immunization Coverage,1990-2005 (WHO/UNICEF Estimated Coverage)

Year	OPV3	BCG	DTP3	MCV1
1990	60	74	60	58
1991	62	75	62	61
1992	65	76	64	65
1993	67	78	66	68
1994	69	77	68	66
1995	71	77	69	63
1996	83	87	72	79
1997	79	85	73	77
1998	75	83	74	75
1999	71	80	74	74
2000	67	78	75	72
2001	70	76	76	70
2002	70	82	70	72
2003	70	82	70	72
2004	70	82	70	72
2005	70	82	70	72



- Conducting supplemental immunization activities (SIAs): Indonesia has conducted national immunization days (NIDs) and sub-national immunization days (SNIDs) since September 1995

(See Table 2). They have consistently reported over 85% coverage of the targeted population.

SNIDs were conducted in high-risk areas from 1998 to 2001. In 2002, following recommendations from the regional Technical Consultative Group, Indonesia held two rounds of NIDs in September and October 2002. Coverage greater than 80% was achieved in all but six provinces. Thereafter and until the 2005 polio outbreak, Indonesia relied solely on routine immunization to achieve OPV3 immunization coverage. No NIDs or SNIDS were conducted after October 2002.

Table 2. *Supplemental immunization activities in Indonesia 1995-2005*

Year	NIDs/SNIDs	Number of children under five years targeted	Date of first round	Date of second round	First round coverage (%)	Second round coverage (%)
1995	NID	21,747,958	Sep-1995	Oct-1995	101.80	106.40
1996	NID	21,870,299	Sep-1996	Oct-1996	105.50	107.70
1997	NID	22,345,581	Sep-1997	Oct-1997	104.90	106.80
1998	SNID	410,984	Sep-1998		90.40	92.00
1999	BIAS[2]	169,559	Nov-1999		99.00	
1999	SNID	4,056	Sep-1999	Oct-1999	88.90	79.90
2000	SNID	1,364,317	Sep-2000	Oct-2000	94.20	92.80
2001	Backlog		Sep-2001		84[1]	
2001	SNID	517,904	Sep-2001	Oct-2001	98.90	96.60
2002	NID	20,031,168	Sep-2002	Oct-2002	107.00	108.60
2005	SNID	6,287,418	May-2005	Jun-2005	104.15	92.75
2005	NID	23,426,156	Aug-2005	Sep-2005	94.99	97.76
2005	NID	23,620,427	Nov-2005		98.24	
2006	SNID		Jan-2006			
2006	NID		Feb-2006	Apr-2006		

[1]Children under three were targeted and coverage reported from three out of five provinces.

[2]School children Immunization Month (children between 9-12 years of age).

In a large country the size of Indonesia, aggregated national data often conceal areas of poor performance. These sub-national areas are typically more remote, experiencing ongoing conflict, or facing budgetary constraints for implementation of EPI and other programmes. In 2005, Indonesia faced several new health-related challenges including the aftermath of the 26 December 2004 tsunami, the polio outbreak, and avian influenza virus. It is a country with many remote and hard-to-access areas, which are affected by conflict and/or multidimensional crises for many years. Sub-national data on vaccine- preventable diseases and immunization coverage have been limited. With the polio outbreak, it became clear that analysis of sub-national data was critical to identify poor- performing and high-risk areas.

National polio laboratories also contribute to polio eradication in Indonesia. There are three national polio laboratories: National Institute of Health Research and Development (NIHRD) in Jakarta, PT Biofarma in Bandung, and Public Health Laboratory in Surabaya. All three have met the WHO standard proficiency test conducted each year with results of 100%. The PT Biofarma laboratory has performed the intra-typic differentiation (ITD) testing since 1998.

AFP surveillance

In 1997, the polio eradication programme expanded to include surveillance of acute flaccid paralysis (AFP) and was implemented under the responsibility of the Director- General of Communicable Disease Control and Environment Health (DG-CDC-EH), Ministry of Health. The data collection and reporting information flows upwards from the community through the districts to the central level. Cases of AFP are reported from health facilities and all hospitals and health centres have to report AFP cases to the district health office. The district health office sends the case information to the provincial health office and from the provincial health office the case is reported to the central level (Sub-directorate of Surveillance, DG of CDC – EH). According to the latest National Certification Committee for Polio Eradication (NCCPE) report, there are currently 1112 hospitals and 7217 public health centres acting as reporting sites. Reports are done by these hospitals and health centres regularly, on a weekly basis for both active and passive surveillance.

In 2002, in an effort to strengthen AFP surveillance, WHO began supporting the Government of Indonesia (GoI) to appoint Surveillance

Officers (SOs) at the provincial level. Indonesia recruited SOs from existing government staff for each province and with terms of reference (TORs) that reflected a focus on AFP surveillance. Since February 2002, there have been 36 – 38 SOs working in the provinces (originally 30 provinces, now 33 provinces); very few are medical doctors, most are government staff with a variety of backgrounds primarily in public health. In the large provinces such as West Jawa, Central Jawa, East Jawa and South Sulawesi, two SOs are appointed. All are assigned to work fully on AFP surveillance and, more recently, to integrate VPD surveillance. At the central level, there are currently four WHO National Regional Coordinators (one was added in early 2006 and a fifth is expected to be added in late 2006). They are responsible for large geographic areas covering several provinces.

Two joint International-National AFP Surveillance Reviews have been conducted in Indonesia. The first review in December 1997 comprised six teams which reviewed the surveillance activity and performance in 10 provinces and four polio laboratories. The second review was held in June 2003 with 12 international-national teams. Although numerous recommendations were made to strengthen the surveillance structure and activities, data management, monitoring, training, information feedback, polio laboratories, and national committees, the Review Team concluded that it was highly unlikely that wild poliovirus was circulating in Indonesia. The main conclusion of the 2003 review team was:

Indonesia has not detected indigenous or imported wild polioviruses since 1995. The AFP surveillance system, although not sufficiently sensitive to detect every single case of AFP, is expected to detect all chains of poliovirus transmission, including importations of wild poliovirus or the emergence of cVDPVs. Therefore given the period of time since the last detection of indigenous wild poliovirus and the performance of the AFP system, the Review Team believes that it is highly unlikely that wild poliovirus is currently circulating in Indonesia. Nevertheless, the 2003 AFP indicators are slipping, and the review team is very concerned that AFP surveillance in 2003 may not be able to achieve the certification standard surveillance for 2003, which could, if not corrected, eventually jeopardize the certification of Indonesia (as part of the SEA Region) as polio-free.

With the exception of year 2000, the Indonesia AFP surveillance system met the internationally accepted standard non-polio AFP rate of 1/100 000 children under 15 years of age each year since 1997. The other main surveillance quality indicator, the percentage of adequate specimens,

also could be maintained above 80% as targeted, except in 1997, 2000 and 2001. [See Section 4.5 under *Surveillance Performance* (table 3) for standard surveillance quality indicators].

2. Objectives/terms of reference of the review

The primary objective of the review was to monitor and verify that surveillance has been strengthened and to identify gaps in surveillance and immunization coverage that may impede the progress to achieve regional and subsequently global certification.

The Terms of Reference (TORs) were to:

(1) Review the status of the polio outbreak curtailment and polio eradication activities in Indonesia and to assess whether the strategies and structure in place for polio eradication have the potential to reach and maintain zero-polio status till regional and global certification;

(2) Assess whether AFP surveillance is functioning adequately at all levels and all geographical areas, especially high-risk areas as per WHO guidelines and that no AFP cases are missed. This includes assessment of the adequacy and quality of reporting units, active case searches, weekly case reporting including "zero reporting", case investigations, 60-day follow-up, stool collection procedures, reverse cold chain and transportation, case classification, documentation, and data management and analysis;

(3) Assess the capacity and sensitivity of the surveillance system to rapidly detect and respond to further wild poliovirus importations as well as circulating VDPVs and whether the polio eradication programme can continue to mount an appropriate response;

(4) Conduct active case searches in selected provinces and districts (or other reporting units) to detect AFP;

(5) Assess whether the quality of information collected and documentation and reporting at national, province and district levels is adequate and was being used to strengthen surveillance;

(6) Review the activities of national committees involved in polio eradication, i.e. the National Expert Review Committee, the National Certification Committee for Polio Eradication (NCCPE) and the Laboratory Containment Task Force;

(7) Assess the capacity of the expanded AFP surveillance system to track measles, NNT, and other priority vaccine-preventable diseases (cases and outbreaks) and provide good quality data for evidenced-based decision-making;

(8) Conduct an on-site review of laboratory procedures and work practices being followed in the polio and measles laboratories.

(9) Evaluate the scope, status and structure of the WHO-supported Surveillance Officer Network, which supports AFP and other VPD surveillance in Indonesia and provide a general synopsis of its impact, effectiveness and future role, and

(10) Follow-up on the recommendations of the National/International AFP Surveillance Review conducted in 2003.

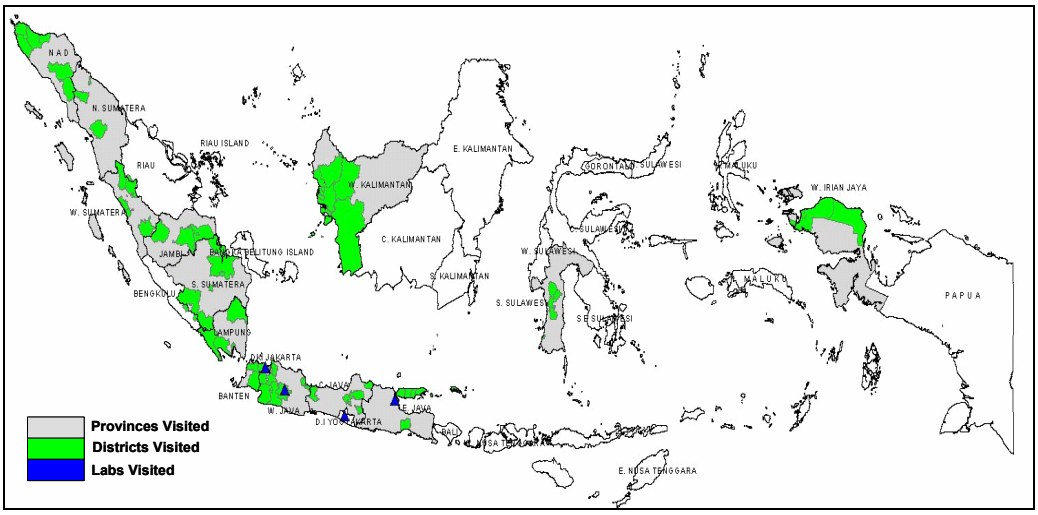
3. Conduct of the review

Sixteen teams were formed comprising one international staff and one senior national staff from the Ministry of Health (See Annex for the composition of teams and places visited). The review was conducted at national level, and in 14 of the 33 provinces as well as in Jakarta. The teams visited 68 districts (See Figure 3 for the map of provinces and districts visited). The teams also visited over 83 hospitals and 105 *puskesmases*. Active searches were conducted in 87 health facilities and at least 57 AFP cases were identified that had not been detected previously. Forty-five cases of AFP were reexamined and their parents interviewed. The team at the national level also visited the NPL and met with key polio eradication partners and committees.

The selection of provinces for review was based primarily on risk assessment which examined the non-polio AFP rates in children less than 15 years of age, adequate stool collection rates, population figures, under-immunization in AFP cases, and routine immunization status. The team also included major municipalities, high-risk areas, and border areas. Logistics, accessibility, security, and availability of transportation were also considered

when selecting sites. The Review Team strived to ensure that the areas reviewed were representative of all the regions in Indonesia. Districts were also selected based on the above criterion, wherever possible.

Figure 3. ***Provinces and districts visited by the Joint National/International AFP Surveillance Review team members***



The teams travelled to the field and reviewed all available information and data on AFP and VPD surveillance, routine immunization, and other VPD activities at all administrative levels – national, province, district and sub-district. They conducted active searches for AFP cases in hospitals, inpatient and outpatient records, and district health centre registers and logs. The cold chain and logistics for transportation of vaccines and stool specimens was assessed. Key government officials involved in EPI, polio eradication, and VPD surveillance, health centre staff, NCC and ERC committee members, partners, and WHO staff were interviewed. In addition, the teams interviewed community leaders and nongovernmental organizations (NGOs) about their polio eradication and immunization activities. Children with AFP were also examined and their parents interviewed.

4. Findings and recommendations

The following were the key findings:

- The Review Team recognized the extraordinary challenges (tsunamis, earthquakes, volcanoes, avian influenza and polio outbreak, etc.) recently faced by the people and the Government of Indonesia. In spite of these national calamities, Indonesia remains committed to the national and global polio eradication effort and has vigorously combated the polio outbreak following importation of wild poliovirus and joined with partners to implement supplementary immunization activities (SIAs) and National Immunization Days (NIDs) throughout the country. Indonesia should be commended for effective improvements in OPV coverage which increased with each subsequent NID round.

- At the national level, Indonesia currently meets the minimum surveillance quality indicator of 2 non-polio AFP cases per 100 000 children under the age of 15 and the laboratory system for testing specimens is working well. However, adequate specimen rates are borderline, at the sub-national level the sensitivity of AFP case detection and reporting is variable and frequently suboptimal, and delays in reporting are evident. Given enough reported AFP cases, an outbreak in Indonesia would eventually be detected. However, to mount an early and massive response, it is critical to detect the first cases in the chain of transmission. The ability to rapidly detect wild poliovirus or circulating vaccine-derived poliovirus (cVDPV) is currently inadequate.

- At the time of the review, the Joint National/International AFP Surveillance Review Team could not conclude with confidence that wild poliovirus (WPV) transmission has been interrupted in Indonesia. As recently as April 2006, there was confirmed isolation of WPV in healthy contacts in Aceh province. Only one round of Supplementary Immunization Activity was conducted at the time of the April 2006 isolation. The conditions, which put Indonesia at high risk for the polio outbreak, i.e. the threat of WPV importation and inadequate routine immunization coverage in some areas, still exist.

- There has been obvious progress in curtailment of the 2005 outbreak. However, once the zero-polio status is reached again in Indonesia, considering the low immunization coverage and risk of importation, it is unlikely to be maintained without

aggressive preventive SIAs. The establishment of a technical advisory committee for polio eradication and immunization to guide programmatic action will assist the government in devising appropriate policies to reach and maintain the polio-free status in Indonesia again.

- It was not apparent to the Review Team if surveillance is a priority in Indonesia's health system. If surveillance of diseases and conditions of national importance, not only AFP but also other conditions such as measles, other vaccine-preventable diseases, and avian influenza is high priority, it should be apparent at all levels of a health system.

4.1 Surveillance structure

Main findings

AFP surveillance is a key component of Indonesia's polio eradication programme. Established in 1997, the system has progressively been strengthened with WHO support. In 2002, 38 surveillance officers were assigned to assist with AFP surveillance. The National AFP Surveillance Guidelines were then updated in 2003. AFP surveillance has also been strengthened in some provinces in response to the 2005 outbreak. As discussed earlier, AFP surveillance is under the responsibility of the Director-General of Communicable Disease Control and Environment Health (DG-CDC-EH), Ministry of Health. However, the provincial surveillance officer network, though monitored jointly by the central level CDC surveillance staff and the WHO National Surveillance Regional Coordinators, is under the provincial health structure. All levels of the national public health system are involved in polio eradication and AFP surveillance. The system has the ability to reach to village level and includes private, speciality, and government health centres.

National

The DG-CDC-EH has the overall responsibility for the national surveillance of communicable diseases and routinely monitors 28 communicable and noncommunicable diseases including AFP and other vaccine-preventable diseases.

Four full-time posts of Regional Surveillance Coordinators are funded by WHO for AFP and VPD surveillance and other EPI activities. In collaboration with the DG-CDC-EH, the Regional Coordinators are to provide technical assistance, supportive supervision, monitoring of activities and training to the provincial surveillance officers. The Terms of Reference (TORs) of WHO Regional Surveillance Coordinators have not been reviewed recently and do not reflect the integration of VPD surveillance and other EPI activities.

In recent years, the GOI Central-level surveillance programme has been weakened. The number of staff devoted to general surveillance, and specifically to AFP surveillance, has decreased. Because of many competing priorities and limited budgets, the CDC surveillance staff are challenged to fulfil supervision and monitoring functions, thereby limiting travel to the field.

It appears that no urgency or priority is given to ensure that AFP surveillance effects trickle down from the national level to the lower levels. Proactive problem-solving or troubleshooting problems, and limitations or gaps in the system have caused delays or continuation of problems. For example, missing specimen samples had not been tracked and EPID numbers had been changed without adequate follow-up with laboratories and districts.

Province

A provincial-level surveillance system is in place in all provinces. However, there is significant variability in the level of human resources, surveillance budgets, travel funds, commitment, knowledge, technical competence and quality of surveillance among the provinces visited. Most provinces appear to have sufficient manpower to conduct quality disease surveillance including AFP and other vaccine-preventable diseases. However, Many SOs may not have received training on the latest global AFP surveillance strategies and recommendations. Out of the 37 SOs, eight have been on the job for less than one year. Twelve of the SOs had their AFP surveillance training as far back as January-February 2002.

There appears to be a lack of prioritization of activities and specifically using data for decision-making, taking action, and setting priorities. It should be recognized that data analysis at the province level is critical for quality surveillance and public health action. The provincial level is also critical for sensitizing the lower levels to AFP surveillance, training clinicians, and

relaying feedback on laboratory results and final diagnoses to appropriate staff. In general, the provincial AFP surveillance officers also act as the liaison between the central and district programme components and staff.

The TORs for the AFP Provincial Surveillance Officers are developed by the DG-CDC-EH, in collaboration with WHO. These were updated recently to include integrated disease surveillance for priority VPDs (measles, neonatal tetanus, Japanese encephalitis). However, it appears that these have not been disseminated to all Provincial Surveillance Officers and may only reflect their AFP surveillance responsibilities.

District

Like the provincial-level surveillance system, a well developed surveillance structure is in place in the districts. The district level is key to implementation of the national disease surveillance system. However, there is again a significant variability among districts in the level of human resources, surveillance budgets, travel funds, commitment, knowledge, technical competence, reporting networks, and quality of surveillance performance.

Focal persons for AFP surveillance have been designated in district health offices and although there appears to be sufficient manpower, vacancies in staffing are numerous in at least some districts. When the designated focal person is absent from the office, there is no back-up or if there is a back-up, he/she is limited in knowledge and authority to carry out AFP surveillance duties. In addition, orientation and general surveillance training and specific training for AFP surveillance for new staff at the district level is inadequate. District Surveillance Officers have multiple responsibilities and AFP is often not a priority.

Each District Health Office receives AFP (and other disease) reports from any number of sub-district health centres (*puskesmas*) under their authority. There is usually a focal person for surveillance in each *puskesmas* and these health centres are usually the first place of contact for AFP patients in the government health system. AFP cases are often brought in by female community health volunteers of the *posyandus* (community/village health posts). The level of awareness and knowledge about AFP surveillance, polio, VPD surveillance in general, and other EPI issues is variable and limited.

The quality of surveillance reporting networks and understanding of the AFP case definition at district level were found to be variable. Some districts did not include private hospitals; most districts did not include local traditional healers, female community health volunteers, or private providers. For the most part, there was no review or assessment of the reporting networks by the district, provincial, or national surveillance coordinators to determine if additional sites should be added or unproductive reporting sites removed from the reporting network. There was also no prioritization of reporting sites.

Community/village

The female community health volunteers and village midwives are an important component of the AFP surveillance structure and reporting network. However, they have often not been sensitized to the need for rapid AFP reporting to the sub-district health centres or district-level health offices. During SIAs, these community level staff can be extremely helpful not only with specific SIA tasks but with community mobilization and enquiring about potentially missed cases of AFP.

Stool transport

There appears to be an adequate system for the reverse cold chain and stool transport from the district to the province to the national polio laboratories. Stool samples are usually collected in the district or higher hospitals where AFP cases are hospitalized. However, the process and requirements for stool sample collection is variable and not well understood in some areas. There were instances where specimens were unnecessarily discarded, where one specimen was split into two samples, and where cases with inadequate samples were not properly documented or followed.

Recommendations

National

- The high priority for surveillance must translate into appropriate human and other resources for national, provincial and district levels. The most critical need is to strengthen the national CDC surveillance unit and the WHO surveillance team with sufficient human and other

resources devoted to AFP surveillance, so that the central monitoring and supervision function can be fulfilled. The TORs of the CDC National Surveillance Coordinators and WHO counterparts should be revised accordingly, and emphasis should be placed on field supervision, using detailed checklists.

- To prioritize provinces (and districts within provinces) for follow-up, the CDC/MoH and WHO should determine which provinces have suboptimal surveillance performance (i.e. non-polio AFP rates < 2 per 100,000 children less than 15 years of age, stool collection rates < 80%, silent areas, provinces with OPV3 coverage < 90%, etc.) and devise a plan for remedial action within the next three months.
- To ensure that all Surveillance Officers (SOs) can devote sufficient time to AFP surveillance, the CDC/MoH in collaboration with WHO should investigate the feasibility of placing the SO system directly under the central level (for example, paying their salaries, etc); this may facilitate better coordination, uniformity of performance, and setting priorities for SOs.
- Within the next two months, to more closely monitor the performance of AFP surveillance, CDC National Surveillance staff (with WHO's support) should develop a routine system (e.g. weekly data analysis, monthly review meetings) for identifying problem issues early (e.g. decrease in surveillance sensitivity, silent areas). This system should result in proactive steps to solve problems and resolve issues before they become chronic.
- To ensure high-quality and more uniform active surveillance within hospitals, standard operating procedures (SOPs) should be developed within the next three months and implemented. These SOPs should include outpatient clinics, in addition to inpatient wards, in the standard reporting network. It should also designate reporting staff, training requirements, and active surveillance guidelines.
- The CDC/MoH and WHO should assess the most effective placement of WHO National Surveillance Coordinators. This may require relocating some WHO National Surveillance Coordinators to regional posts in critical, high-risk areas.
- The Government of Indonesia acknowledges that Banten and Aceh provinces are high-risk areas. It also admits that it has imited human resources, and that it would therefore need additional support to strengthen surveillance in these provinces.

Province

- To ensure AFP data are regularly reviewed and challenges identified and addressed, regular and, at a minimum, quarterly analysis of data and review meetings should be held at the province level, chaired by the provincial chief of health. These meetings should include key stakeholders from districts and relevant CDC programmes to review the data for decision-making and setting priorities.

- To increase the sensitivity of AFP surveillance, orientation sessions for hospital physicians (especially paediatricians and neurologists) and private providers should be conducted at least every six months. These sessions should be held within the hospital to ensure that physicians can attend, and should be conducted by senior physicians (for example, retired professors of paediatrics or neurology) to ensure complete attention and a common working language between physicians. Each province should prepare a plan of action for hospital orientation sessions, with the aim of having conducted one session in each priority hospital in the next 6-12 months.

District

- To ensure that surveillance activities are more systematic, more than one staff should be assigned to surveillance in priority areas. Back-up staff should also be well trained to take over routine tasks when the primary surveillance officer is absent.

- To ensure more uniform surveillance knowledge, district and sub-district (*puskesmas*) surveillance staff should receive general and AFP-specific surveillance training. The district health centre staff and health officers should also receive general surveillance training with special emphasis on how to use information for planning. Medical staff in most hospitals should also receive focused AFP and general surveillance training with periodic refresher training.

- The AFP case definition, including conditions which can cause AFP, should be well defined, disseminated, and reviewed regularly with medical staff in health centers and hospitals. District-level medical staff (doctors, nurses, neurologists, paediatricians) should be identified to assist with local training and case definition discussions with providers.

- To improve sensitivity and the community reporting network, the local district reporting networks should be reviewed periodically for adequacy and gaps. The original sources (local health workers, midwives, traditional healers [*dukun*], private providers, and MCH staff) of AFP cases should be determined and incorporated into the routine reporting network as needed.

4.2 Surveillance officers

The key components of effective AFP surveillance in Indonesia are the National CDC Surveillance Officers and WHO-supported Regional Surveillance Coordinators at the central level, Provincial Surveillance Officers, and District Surveillance Officers. The Ministry of Health and WHO have a substantial investment in this public health resource. The four full-time Regional Surveillance Coordinators posts are funded by WHO. Coordinators work in collaboration with the DG-CDC-EH surveillance staff to provide technical assistance, supportive supervision and monitoring of activities, and training to provincial surveillance officers. The Terms of Reference (TORs) for National CDC AFP Surveillance Coordinators and Provincial AFP Surveillance Officers are developed by the DG-CDC-EH, in collaboration with WHO. Although these were updated recently to include integrated disease surveillance for priority VPDs (measles, neonatal tetanus, Japanese encephalitis), they have not been disseminated to all Provincial Surveillance Officers and may only reflect their AFP surveillance responsibilities. The TORs of WHO Regional Coordinators should also reflect the latest AFP and VPD surveillance functions and EPI roles and responsibilities.

There is a general lack of supportive supervision and monitoring of provincial-level surveillance staff by central-level surveillance staff and district-level surveillance by provincial-level surveillance staff. The availability of provincial surveillance officer workplans is variable. Even where these workplans are available, review of the work plans and verification of activities by supervisors is inadequate. Trip reports and travel logs of district site visits by provincial surveillance officers were not available in the sites visited by Review Team Members. The background of Provincial Surveillance Officers varied; few had medical or epidemiological backgrounds and many were functioning as administrative clerks collecting surveillance reports from designated reporting sites, where available.

At the district level, there are designated focal persons for AFP surveillance who, for the most part, make regular visits to reporting units to collect reports. There also are designated staff in hospitals, and primarily medical records staff, which are designated to compile surveillance reports. Again, most of these surveillance staff function as administrative support for collecting and passing on the surveillance reports to the next level. The district SOs have multiple responsibilities with competing priorities and AFP is often not one of these priorities. Although there is also a routine immunization (RI) coordinator at the district level, operationally, the synchronization of RI and surveillance information is not fully in place.

Because of different backgrounds and educational levels, the provincial and district surveillance officers do not provide socialization or training to medical staff in district and provincial health facilities. Currently, there are no district- or province-wide surveillance teams that include medical staff to support surveillance efforts, back-up the administrative arm of surveillance, or provide supervisory or monitoring support to SOs.

Recommendations

- Since surveillance officers in provincial health departments are vital to AFP surveillance in Indonesia, it is critical to devise a system that routinely monitors the performance of these officers, detects problems early, and institutes remedial action as soon as possible. TORs should be reviewed and reflect the latest updates, and should include integrated VPD surveillance; active case finding at priority sites; assisting district SOs with case investigations; monitoring district-level surveillance activities; socialization and training of district and sub-district level staff, and dissemination of information to all field staff within the next three months.
- To continue building strong surveillance systems, the CDC National Surveillance Coordinators with support from WHO should meet regularly (every three months) with provincial surveillance staff to establish priorities and review workplans, active case visits, case investigation forms, data analysis, immunization coverage, reporting networks, travel logs and trip reports, appropriate level of field work and training requirements. National Surveillance Coordinators should verify zero reporting and periodically reinvestigate AFP cases for validation and quality assurance. Activities of Provincial and National

Surveillance Officers should be verified by supervisors and appropriate documentation of visits maintained at all levels. A cross-province training/exchange programme where provincial surveillance staff spend time with surveillance officers in other provinces can provide a mechanism to help improve knowledge and share solutions to common issues faced by all surveillance officers.

- Temporary or back-up surveillance officers at all levels should be qualified, properly trained, and understand the requirements of AFP and other VPD surveillance. Where possible, medical staff from within the government health system can assist and back-up Surveillance Officers who do not have a medical background. These medical staff could also be part of a district or province-level support team to assist with surveillance and training when needed

4.3 Surveillance systems

The surveillance system consists primarily of two arms, immediate reporting of AFP cases and "zero-case" reporting from priority hospitals. Active surveillance, the third arm of surveillance, is virtually non-existent in most provinces and districts.

AFP guidelines (yellow book) were updated in 2003 and provide the basis for conducting AFP surveillance in Indonesia. These do not, however, reflect the latest (2006) global strategies for polio eradication and quality surveillance and response. The guidelines were usually available with surveillance staff in the province and district health offices, especially in areas recently visited by Regional Surveillance Coordinators. However, the availability of guidelines in hospitals was inconsistent. Application of the case definition was variable and not well understood by many clinicians. In some areas it was too broad; in other areas true AFP cases were discarded, especially when the final diagnosis was known to the clinician.

Laboratory results were usually available at the province level. However, there is room for improvement in disseminating laboratory results and the final classification of cases to lower levels and families more rapidly.

With rare exceptions, EPI data were not prominently displayed in health offices or health centres. Recent spot maps of AFP cases, immunization coverage, or other epidemiological analyses of data at the

local level were lacking. The SOs, both provincial and district level, do not routinely analyse their local surveillance data.

There are many reporting forms available to capture the aggregate case counts of AFP on a weekly and monthly basis for reporting to various levels of the system. However, the current case investigation form has only minimal information and may not be sufficient to document comprehensively the characteristics of AFP to support review by the National Expert Review Committee (NERC).

In most areas, the overall availability of documentation of case reports was adequate with some exceptions at the district level.

Immediate reporting

The AFP surveillance guidelines specifically instruct that all AFP cases should be reported to the next higher level within 24 hours of notification from the lower level. However, the urgency of immediate reporting may not be understood at all levels, especially among those not directly involved in reporting and investigation.

Case investigation

Case investigations are required within 24 hours after the report is received. These are usually done by the designated district surveillance officer in conjunction with a doctor of the district health (*puskesmas*) centre or hospital. If the case is considered a true AFP case, stool collection is initiated.

The 2003 surveillance guidelines specify that all AFP cases should be followed after 60 days to determine if there is residual paralysis. However, the current practice is to only conduct follow-up on those cases with inadequate stool collection.

Zero reporting

Zero-case reporting is emphasized but the performance of this system is variable. In most of the lower administrative levels of the health system, zero reports were readily available and properly maintained by the

designated focal person. However, there was often a disconnect between the actual number of AFP cases reported and the weekly zero report in the lower level reporting unit/health facility and regular transmission up the reporting ladder. In some instances, the sub-district (*puskesmas*) zero reports received in district offices did not reflect the actual number of AFP cases reported by sub-districts.

The transmission of zero reports varied and some were transmitted via Short Messaging Service (SMS), special courier, or faxes. Seldom were the data transmitted electronically, even from province to central level. There is no standardized method of zero reporting up the system and timeliness and completeness are not monitored, nor is corrective action taken when problems are noted or reports are not received.

Active surveillance

There is virtually no evidence of "true active surveillance" where SOs review health centre or hospital admission registers (outpatient and inpatient), contact the medical staff, and visit the wards to look for missed cases. The practice of active surveillance is not well understood by surveillance staff. It must go beyond picking up the regular aggregated reports developed by the reporting unit and include actual case searches in registers of at least designated priority sites

Feedback

Although most areas were aware of the polio outbreak in 2005, many of the health centre and district staff heard about the outbreak through the media, and not through the health system. There does not appear to be an adequate system of feedback (including AFP laboratory results and final classification of cases, completeness and timeliness of reporting, other VPD outbreaks, and public health concerns in other provinces) that reaches down to the district and lower levels.

Recommendations

- The current Guidelines for AFP Surveillance (edition 2003) should be revised and expanded to reflect the latest global strategies and

requirements for active surveillance within the next six months. These should include at a minimum the following components:

- Active surveillance where visits should include at least:
  - Screening ward registries (paediatrics, neurology, and rehabilitation);
  - Screening outpatient and inpatient clinic records;
  - Interviewing key clinicians; and
  - Signing and dating the registries reviewed.
- In low-performing areas, retrospective record reviews should be undertaken on a regular basis to search for unreported AFP cases. Standard operating procedure (SOPs) and documentation forms should be developed and used.
- Previously-missed AFP cases identified during active searches should be entered into the national line list and presented to the National Expert Review Committee.
- A policy on cross-border notification of AFP cases including districts, provinces, and across national borders should be developed and included in the guidelines.
- A policy on contact stool sampling should be included and disseminated to surveillance officers as soon as possible.
- Both silent areas and areas with very high numbers of AFP cases should trigger special investigations including reviewing of immunization coverage in the area.
- The concept of "hot cases" to improve the rapidity of reporting and investigation should be considered.
- The standard case investigation form should be expanded to include all necessary clinical information and data for epidemiological analysis of cases (including the date and source of first contact).
- The guidelines should be expanded to include vaccine-derived polio virus.
- The follow-up of AFP cases should reflect the policy (since 2004) of only conducting a 60-day follow-up on AFP cases with inadequate stool.

- Emphasis on the use of virological classification of cases should be reflected.
- The operational target of 2 per 100 000 children less than age 15 should be reflected instead of 1 per 100 000.
- The surveillance quality indicator of 80% ITD results within 60 days of paralysis onset should be introduced.
- Update the list of conditions which may present with AFP and encourage reporting of these conditions even if the diagnosis is known.
- Update, define and disseminate the requirements for zero reporting.

➢ Support should be provided to provincial and district surveillance officers to analyse local data, display analytic results, and use data for action and setting priorities. These analyses could be used for determining high priority sites for active case searches.

➢ SOPs for active surveillance (case searches) in hospitals and health centers should be developed and disseminated to surveillance focal persons at all levels within the next three months. These searches should be monitored regularly with appropriate documentation by supervisory staff.

➢ Guidelines for contact sampling around AFP cases with inadequate stools should be developed within the next two months and disseminated to all surveillance staff.

➢ Guidelines for cross-border notification of all AFP cases should be developed and disseminated within the next two months. These should include immediate notification to the Regional Office on all AFP cases crossing national borders.

➢ A mechanism for routine and standard feedback on AFP, polio, VPD and immunization coverage should be developed and disseminated to all levels. This could take the form of a weekly or monthly newsletter which highlights reporting strengths, gaps, timeliness, and completeness.

4.4 Surveillance reporting culture

Main findings

The reach of the surveillance system from national level down to the *posyandus* and community-level female health volunteers is impressive. However health-seeking behaviour is variable in different provinces and may limit timely case finding, investigation and response, and immunization coverage. Small incentives are paid to local health staff who report AFP cases. These incentives are minimal and do not appear to impact negatively or lead to over-reporting of cases.

In general, AFP reporting is encouraged but there have been instances where reporting of AFP cases was discouraged. However, such instances are not representive of the national policy. They only reflect local problems. There are more instances where other VPDs, specifically reporting of measles cases reporting is discouraged and cases of measles reported in hospital records are not reflected in the surveillance records of district and provincial health offices.

There is a lack of urgency for immediate reporting. Many patients in remote and rural areas will first seek care from traditional healers before seeking care in hospitals or district health centres. There is no proactive attempt at problem-solving in silent areas or areas with chronic reporting delays.

The reporting networks, especially in large urban areas, often do not include private providers.

Parents regard to community leaders, midwives and local practitioners as credible sources for information about public health and routine immunization. Views of these local leaders can influence local health-seeking behaviour.

Recommendations

- To further increase the sensitivity of case detection, reporting networks should be expanded to include private practitioners, traditional healers, community midwives, community volunteers, and local leaders where necessary. Socialization of AFP and other disease surveillance should be conducted periodically in local communities.

4.5 Surveillance performance

Main findings

Since 2001, Indonesia has consistently met the minimum WHO recommended surveillance performance indicators for non-polio AFP rates and the adequate stool collection rate. To date in 2006, the national non-polio AFP surveillance rate is 1.73 per 100 000 children less than 15 years of age. See Table 3 for a summary of the major surveillance quality indicators since 1997.

The 2005 SEARO Technical Consultative Group (TCG) recommended a new target non-polio AFP rate for the Region. The new target is 2 per 100 000 children under 15 years. Nine (30%) of the 30 provinces (with data in 2005), did not meet the 2 per 100,000 target and one (Papua) did not meet the minimum 1 per 100 000. These provinces should be evaluated to see how surveillance can be improved.

Table 3. *Surveillance indicators in Indonesia since 1997*

Indicator	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006[1]
AFP Cases	715	785	675	593	660	848	749	782	1939	703
Wild Polio	220	44	31	37	0	0	0	0	303	2
VDPVs	0	0	0	0	0	0	0	0	46	0
Compatibles	0	0	0	0	4	7	5	5	75	0
AFP Rate	1.23	1.23	0.77	0.89	1.01	1.3	1.2	1.26	3.12	2.2
Non-Polio AFP Rate[2]	0.78	1.15	0.66	0.84	1	1.29	1.19	1.26	2.44	1.73
Adequate Stool Collection Rate[3]	53	79	88	86	82%	84%	90%	92%	80%	83%
Total Stool Samples Collected	1401	1781	1373	1186	1228	1670	1473	1554	3760	1348
% NPEV	9	7	8	7	8	10	13	11	10	113
% Reported Within 28 Days	60	96	100	100	98	99	100	100	99	99

[1] For 2006, data as of 10 Jul 2006.
[2] Number of discarded AFP cases per 100 000 children under 15 years of age.
[3] Percent with two specimens 24 hours apart and within 14 days of paralysis onset.

Recommendations

- At all levels, surveillance officers should analyse province and district-level data routinely. Special attention should be paid to under-

performing areas by the standard surveillance indicators and proactive and corrective action initiated. Routine analysis of surveillance performance should be completed and disseminated as feedback to all levels of the health system.

4.6 Surveillance data management

Data management, analysis, and reporting at the national level has improved substantially in response to the 2005 polio outbreak. Regular reports and presentations are produced, surveillance quality indicators at the provincial level are calculated and mapped routinely, spot maps of cases are created, epidemiologic curves of non-polio AFP cases are graphed, and other epidemiological analyses completed.

However, timely flow of data, assignment of EPID number, feedback and troubleshooting of data problems, efficient linking of surveillance and laboratory databases, inconsistent data at different levels including disease and population data, and other data quality issues continue to cause problems throughout all levels. The annual aggregated data reported through the WHO/UNICEF Joint Reporting Form (recent 2005 submission) is not always consistent with the data in specific programmes (i.e. routine immunization coverage data) or what is reported through other reporting mechanism (SEARO Annual EPI Report Form). In addition, the laboratory data do not always match with surveillance data; inconsistencies in measles outbreak reports are a good example.

Recommendations

- To ensure more uniform performance, the national data management unit should develop written data management guidelines, back-up, and operational procedures that can be shared with provinces. These should include trouble-shooting strategies for basic data management issues, coding, data dictionaries, acronyms or programmes for standard reports, and a list and guide to solve common errors.
- A standard, transparent, and uniform method of data collection, transmittal, and reporting should be streamlined, strengthened, and implemented uniformly in provinces and districts. Routine feedback reports on data problems and data quality issues, including timeliness and completeness, should be provided to provinces and districts.

Areas which are chronic in late or incomplete reporting should receive special training and assistance to improve reporting.

4.7 Integration of vaccine preventable disease surveillance

There is a passive integrated system for 28 communicable and noncommunicable, diseases. There are seven types of forms for weekly and monthly reporting of measles cases. Health workers indicated that they were fatigued by the number of reports. Standardized forms are not used consistently and new forms have not replaced the old forms in some areas.

There is a lack of data analysis and follow-up of areas with under-reporting. Low priority is given to using data to identify and investigate outbreaks. In some areas measles reporting was openly discouraged by the district health office. Neonatal tetanus (NNT) surveillance is limited with no collaboration with Maternal and Child Health (MCH) programme staff.

Recommendations

- Although the reporting of measles and NNT is part of the integrated disease surveillance system, there is little programmatic action following the reporting of cases or outbreaks. Guidelines for programmatic action following detection of cases or outbreaks of measles, or cases of NNT should be updated, disseminated widely, and used.

5. Implementation of recommendations of the previous AFP Surveillance Review (2003)

The implementation of the recommendations from the 2003 Joint National/International AFP Surveillance Review in Indonesia was incomplete. Unfortunately, most of the recommendations of the 2003 review were not implemented. As a result, surveillance was not strengthened, and the possibility of missing cases and outbreaks of polio persisted into 2005 when the importation of WPV led to a large outbreak of polio, and the emergence of cVDPV led to the largest outbreak ever detected. The recommendations from the 2003 review are still relevant in 2006 and should be reviewed and considered for implementation.

6. National Polio Laboratory (NPL)

Three national polio laboratories are functioning in Indonesia. These are Centre for Disease Control, Research and Development (CDC) Jakarta, Biofarma Bandung and Public Health Laboratory (PHL) Surabaya. In spite of the increased workload in 2005 the laboratories were able to effectively fulfill the requirements of the programme. Reporting of primary isolation results within 28 days and ITD results within 14 days was completed in more than 95% cases. Based on the performance for the last 12 months and results of proficiency tests and an onsite review, the laboratories meet the WHO standards and are accredited for 2006.

There has however been considerable delay in shipment of isolates to the Global Specialized Laboratory (GSL) for sequencing. There still are 12 wild polio cases (reported by the surveillance programme) for which reconciliation is still pending. During review of NPL Bandung, it was acknowledged that nine samples had not been referred to the GSL by the laboratory. Two samples had been discarded inadvertently by the laboratory, one was negative and in two cases, the EPID numbers had been changed after the samples were referred to the GSL (this information was not provided to the laboratory). In summary, it is possible to reconcile 10 of these cases. Unfortunately for the two discarded samples, original stool samples, extracts and isolates were also discarded by the referring laboratory (Jakarta). Therefore, a re-test is not possible and these will be considered as wild but will not appear on the dendogram.

Four national measles laboratories at Jakarta, Bandung, Surabaya and Yogyakarta were also reviewed. The laboratories receive 5 to 10 blood samples from outbreaks. Serological confirmation is done for measles and those negative for measles are tested for Rubella. The laboratories also perform measles virus isolation and isolates are referred to Centre for Disease Control and Prevention (CDC) Atlanta, USA for genotyping. Based on the performance of the last twelve months, quality assurance and onsite review, all laboratories are fully accredited for 2006.

Recommendations

- To ensure timely sequencing of poliovirus isolates, NPL Bandung should refer all wild polio isolates and those showing discordant ITD result at the earliest (within seven days) to the GSL for sequencing.

Issues that restricted referring isolates to the GSL for sequencing (Government of India clearance and identifying a courier service) have been sorted out. These should be monitored and any delays quickly resolved.

- Any change of EPID numbers should be communicated to the NPL and the GSL by the surveillance programme and should be resolved before the laboratory results are submitted to the programme.
- For measles laboratories, the inventory of consumables and kits should be maintained and procurement of kits should be streamlined and initiated early to avoid delay in testing. Any anticipated delay should be brought to the attention of the Virologist – IVD in advance.

7. National Certification Committee

The National Certification Committee (NCC) reports to the Regional Certification Commission (RCC), and compiles a report on the status of polio eradication in Indonesia, and then follows up with annual updates. The NCC has been advising the government on outbreak control strategies during the past year, but has not met as NCC since 2005. The major issue at this point is membership; several members appear to be inactive and should be replaced.

Recommendations

- The NCC should meet at least on an annual basis.
- The membership of the NCC should be reviewed by the CDC/MoH and WHO jointly to determine which members are active and which members are inactive. Active members should be retained, and inactive members should be replaced. A list of possible replacement candidates should be compiled and provided to the Minister of Health for possible appointment.

8. National Expert Review Committee (NERC)

The National Expert Committee reviews AFP cases with inadequate specimens to derive at a final classification (either discarded or compatible), assist with technical issues, especially the interpretation of information

related to AFP surveillance, and advises, if requested, the MOH on strategies for polio eradication. A total of 7 members constitute this committee. The committee meets every month or every other month depending on the quantity of cases to be reviewed. In addition to compatible, non-polio, pending, the committee also determines non-AFP cases. The major issues for the committee at this point are: 1) membership and chairperson; and 2) quality of data submitted for review. In addition, one province (East Java) has their own classification committee. See table 4 for summary of NERC meetings.

Table 4. *Summary of meetings conducted by the NERC**

Date	Cases reviewed	Results			
		Compatible	Non-polio	Non-AFP	Pending
10 Jul 2006	43 pending cases in 2006	5	22	6	10
17 May 2006	25 pending cases in 2005	17	8	0	0
17 Feb 2006	10 pending cases in 2005	2	6	2	0
19 Jan 2006	56 pending cases in 2005	26	11	19	0
27 Oct 2005	47 pending cases in 2005	16	19	11	1
13 Oct 2005	93 pending cases in 2005	22	25	16	30
24 Feb 2005	16 pending cases in 2004	0	11	5	0
19 Oct 2004	18 pending cases in 2004	0	10	6	2
24 Feb 2004	21 pending cases in 2003	3	7	4	7
19 Sep 2003	14 pending cases in 2003	3	7	3	1
1 April 2003	11 pending cases in 2002	3	6	2	-
14 Jan 2003	27 pending cases in 2002	1	9	6	11
19 Nov 2002	25 pending cases in 2002	1	10	5	9
27 Aug 2002	28 pending cases in 2002	3	11	5	9
4 June 2002	36 pending cases in 2002	-	27	5	4

* Source : National Expert Review Committee, August 2006

Recommendations

- The CDC/MoH and WHO should jointly review the membership of the NERC, and retire inactive members, and propose replacement candidates for committee membership, as appropriate, to the Minister of Health for possible appointment.
- The AFP case investigation form should be reviewed, and revised as appropriate, to ensure that the basic clinic information on AFP cases is included. In addition, if an AFP case is investigated, and it is apparent that no adequate specimens have been collected, the programme should ensure that hospital records, especially discharge summaries, should be attached to the AFP case report, and made available to the NERC to assist in their classification efforts.

9. Laboratory containment of polioviruses

Phase I activities have been completed. The survey began in October 2001 and was completed in August 2003. A list of laboratories was compiled and of the 2636 biomedical laboratories identified and screened, 2610 laboratories were contacted. Response was obtained from all laboratories (100%) by January 2005. Only one laboratory, the Biofarma Laboratory in Bandung, was certified to store wild poliovirus as per the national report on phase I containment activity (April 2005).

After the 2005 polio outbreak, it is necessary that the task force reviews the list of laboratories again. There are three national polio laboratories which are storing stool samples collected during the outbreak period (as per the requirement of the laboratory guidelines to store the samples for twelve months). The Bandung laboratory is also required to store the wild polio virus and VDPV isolates.

Recommendations

- The National Task Force for Laboratory Containment of Wild Poliovirus (Indonesia) should review the laboratories likely to be storing wild polio virus, VDPV and infectious materials and re-submit its report to the National Certification Committee.

10. Plan of action for responding to polio outbreak

Indonesia has a plan of action for responding to polio outbreaks or the detection of vaccine-derived polio outbreaks. However, this has not been updated with the latest World Health Assembly (WHA) resolution passed in 26 May 2006. This resolution focuses on rapid investigations and institution of massive control efforts following the detection of wild poliovirus using monovalent OPV. The resolution also highlights the need to conduct at least two large SIAs following the detection of the last poliovirus.

Recommendations

- Indonesia's Plan of Action (PoA) for Responding to a Polio Outbreak should be reviewed, updated and disseminated to all health system levels and include the latest recommendations from the World Health Assembly resolution (26 May 2006). In line with the resolution passed at the 117 session of the Executive Board of WHO, the PoA should include large, responsive mop-ups in the event of additional cases or new importations.
- Since the last SIA was conducted during the time when the last wild poliovirus type 1 was detected in a contact in South Aceh province, the PoA should include an aggressive plan to carry out SIAs. This should include giving OPV during other immunization opportunities such as the measles campaigns and specifically targeting the upcoming measles campaigns in Sumatra (including Aceh and North Sumatra at the same time) and Java. Taking into account the epidemiological data, the Government of Indonesia may wish to consider two rounds of NIDs in 2007.
- To better advise the MoH on programmatic issues for polio eradication and immunization, a Technical Advisory Group (TAG) comprising national and international experts should be established and its meetings convened regularly.

11. Routine immunization

Routine immunization plays an important role in polio eradication. In 2005, Indonesia estimated that the national routine immunization coverage of OPV3 was 91% (Source: WHO/Unicef Joint Reporting Form 2005). The

provincial-level coverage varied from a low of 43.7% in Papua to a high of 98% in Bali (Source: SEARO Annual EPI Reporting Form). In 2005, 11(34%) of 32 provinces reported OPV3 coverage below 80%. In the same year 19 (63%) of 30 provinces (with 2004 and 2005 data) showed a decrease in the OPV3 coverage rates.

Despite the fact that immunization staff have been assigned for many years, many have not received formal training on routine immunization. While there is some general understanding about vaccine and cold chain management, the overall management needs strengthening, i.e. how to place vaccine orders based on target population, proper vaccine storage and general cold chain maintenance.

Several misconceptions about immunization seem to exist in communities and among health care workers and volunteers. For example, there are misconceptions about not vaccinating mildly sick children, not giving two injections at the same time, about fever after vaccinations, or about the fear of children crying after injections.

While revival of the *poseandu* is being attempted, progress appears to be slow for increasing routine immunization coverage. Apparently in the past, food supplementation was a strong incentive to increase attendance for immunization. However, this practice has been discontinued. Participation of health centre immunization staff ("*jurim*") is critical in planning, promoting, documenting and conducting immunization activites.

While in some places vaccines and other supplies were observed as sufficient, stock-outs were noted and delayed delivery reported. Vaccines have to be picked up by District Health Office from the Provincial Health Office and by Health Centre staff for the *posyandu*. This is often hampered by lack of funds for transportation.

There seems to be confusion about individual OPV vaccine dose reporting. Apparently OPV1 refers to a birth dose but is given in variable timing depending on the first contact with the health system. Often the OPV4 coverage was found to be significantly lower than that of OPV3 probably due to delays in the whole series. In addition, in some areas, midwives counted SIA doses under routine doses. In some places, the OPV3 coverage was found to be lower than that of DPT3 or even the first dose of measles containing the vaccine (MCV1). However, the reasons for

this are unclear. Furthermore, a frequently high drop-out between DPT1 and DPT3 coverage was observed. However, comprehensive data analysis appears very limited and information available is rarely used for corrective actions.

Recommendations

- The highest priority is to confirm reported routine immunization coverage by province through surveys, and map the low-coverage areas in each province, to allow targeting these low-performing areas for intensified follow-up activities.
- Regular monthly tracking and review of progress in immunization coverage and drop-out rates should be implemented at all hospitals and health centres.

12. Follow-up

Given the importance of these recommendations to the Global Eradication Programme, the CDC and WHO should develop a plan of action for implementation of recommendations, documentation, monitoring and follow up. The WHO South-East Asia Regional Office (SEARO) should follow up on the status of the review recommendations made by the review after six months.

13. Conclusions

Although progress has been made towards establishing a sensitive and high-quality surveillance system in Indonesia, at present, the review team feels that the AFP surveillance system does not function adequately to detect all cases of AFP. It is the opinion of the review team that AFP cases, and by extension polio cases, have been regularly missed in many areas of the country. Therefore, the review has drafted a number of recommendations that, if implemented, will allow the Government of Indonesia to strengthen surveillance to the point where it may become at par with other countries in the SEA Region, and permit the detection of almost all AFP cases.

14. Acknowledgements

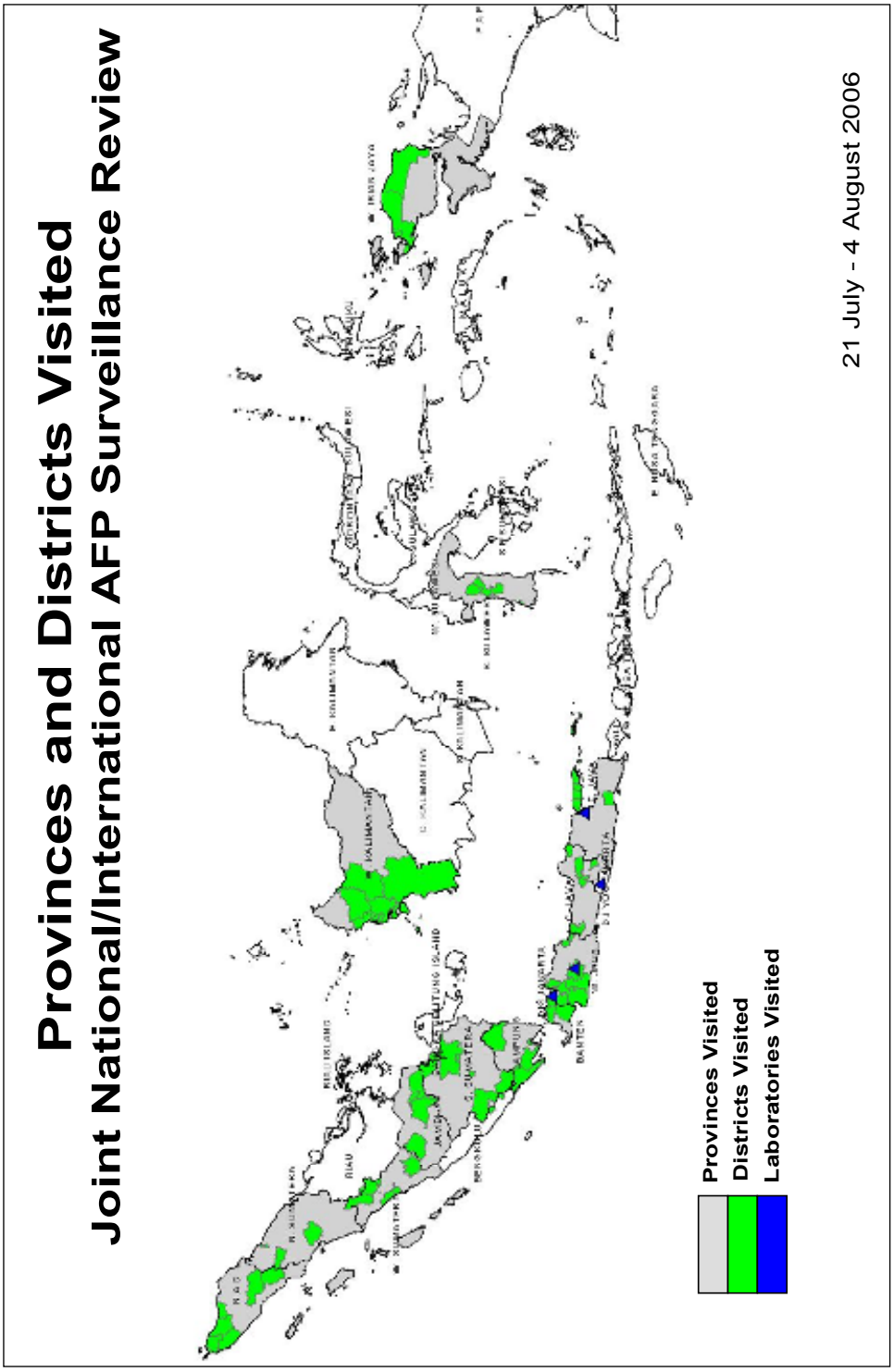
Members of the Joint National and International Review Team would like to thank everyone who contributed to the work and outcome of this review. Our field visits could not have been as productive and informative or as pleasant were it not for the commitment, effort and courteous assistance provided by them. The team also wants to express its appreciation to the WHO Representative and his team in Indonesia, the team at the Ministry of Health and the sub-Directorate of Surveillance, under the Directorate of Epidemiology, Immunization and Matra Health, under the Directorate-General of Communicable Disease Control and Environmental Health for their untiring support, hospitality and overall facilitation of the mission.

Annex

List of Indonesia AFP International Surveillance Review team members

Team No.	International Team Member	Designation	National Team Member	Designation	Region/Province
1	Dr Roland Sutter - Team Leader	WHO HQ	Prof Agus Syarurachman	Virologist, University of Indonesia, Member of NCC	National Committees and Jakarta
1	Dr Arun Thapa	RA-IVD, WHO SEARO			Debriefing Session Only
1	Dr Nalini Ramamurthy	Virologist, SEARO	Drh Gendro Wahyuhono		National Level Polio and Measles Labs
1	Dr David Hipgrave	UNICEF – Regional/Country Office			National Committees and Jakarta
1	Mr Chris Maher	WHO HQ			Debriefing Session Only
2	Ms.Karen Hymbaugh	TO-Surveillance, SEARO	Dr Nelly Amalia	Paediatrician, Hospital Hasan Sadikin, Bandung, West Java	West Kalimantan
3	Dr.Anne Golaz	Acting RA Polio, SEARO	Dr Dr Sunartini Hapsara	Paediatrician, Sarjito Teaching Hospital, Univ. of Gajah Mada Yogyakarta. Member of Local ERC	Banten
4	Dr Jayantha Liyanage	MO-(EPI), SEARO	Suharno, MKes	Epidemiologist, CDC Banten, Ex. AFP Surveillance Officer	South Sumatra
5	Dr Rajiv Gera	WHO NPSP, India	Mr Johnny Hutahaean	Epidemiologist, AFP Surveillance Officer, Papua	West Irian Jaya
6	Dr Naveed Sadozai	WHO HQ	Dr Tri Yunis Miko, MPH	Epidemiologist, Public Health University of Indonesia	East Java

Team No.	International Team Member	Designation	National Team Member	Designation	Region/Province
7	Dr Linda Venczel	CDC, Atlanta, USA	Ms Asmaniar, SKM	Epidemiologist, Chief of Monev, EPI, Subdirectorate of Immunization.	Aceh (South)
8	Ms Sue Gerber	CDC, Atlanta, USA	Dr Ratgono, MSc	Epidemiologist, Retired, Chief of CDC, East Java	South Sulawesi
9	Dr E G P Haran		Mr Suwandi S Mikes	Epidemiologist, CDC Java Tengah, Ex AFP Surveillance Officer	West Java
10	Dr R N Basu	Participant – TCG	Suwandi Sawadi, MKes	Epidemiologist, CDC Central Java, Ex. AFP Surv. Officer	West Java
11	Dr Sigi Roesel	WPRO – Regional Office	Dr Jonas Sumampow,	CDC, North Sulawesi, Ex AFP Surveillance Officer	Aceh (North)
12	Dr Madhav Ram	WHO – NPSP, India	A Rochim, Mkes	Epidemiologist, Ex National AFP Surveillance Officer	Central Java
13	Dr Ganga Ram Choudhary	WHO IPD, Nepal	Dr Eko Priyono, Mkes	Epidemiologist, Subdirectorate of Surveillance Epidemiological	Jambi
14	Mr Keith Feldon	UNICEF – Regional/Country Office	Dr Nani Kumiani	Paediatrician, Hospital Hasan Sadikin, Bandung, West Jawa	West Sumatra
15	Dr Piyanit Tharmaphornpilas	Participant – Thailand	Prof Dr Sumarmo P Soedarmo, SpA(K)	Paediatrician, chairman of NCC	North Sumatera
16	Dr Pandup Tshering	Participant - Bhutan	Dr Herini	Paediatrician, Sarjito, Teaching Hospital, University of Gajah Mada Yogyakarta. Member of Local ERC	Lampung


Provinces and Districts Visited
Joint National/International AFP Surveillance Review
21 July - 4 August 2006
Provinces Visited
Districts Visited
Laboratories Visited