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# Joint National/International Review of Acute Flaccid Paralysis (AFP) Surveillance – Nepal

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# Executive Summary

## Key findings

Wild poliovirus is most likely circulating in high-risk, open border areas of Nepal. The Nepal acute flaccid paralysis (AFP) surveillance system is sensitive enough to detect circulation or importation of wild polio cases in a timely manner. Also, the Nepal Expanded Programme on Immunization (EPI) has the capacity to respond quickly and effectively if an importation or vaccine-derived poliovirus should occur. Other important findings are noted below.

- The four polio cases reported in Sarlahi and Rautahat in 2005, coupled with positive contact samples from the same area, are timely reminders of the risks of wild poliovirus importation across the border with India. Furthermore, the polio case in Dailekh district in March 2006, which is not close to the border, shows that any part of the country can be threatened by importation.
- In 2005 and 2006 to date, there are several 'silent' districts in the Mid-West and Far-Western Developmental Regions that have not reported AFP cases.
- The Nepal AFP surveillance system has effectively integrated other vaccine-preventable diseases (VPDs) including measles, neonatal tetanus (NNT), acute encephalitis syndrome (AES), and *Haemophilus influenzae* b (Hib) into activities without diminishing the quality of AFP surveillance. However, the assigning of responsibility for any additional diseases or EPI activities to Surveillance Medical Officers (SMOs) will need careful evaluation, and specific and clear guidelines.
- Security is an intermittent, non-permanent obstacle to surveillance access. Security clearance is always required before traveling to investigate AFP cases. However, comparison of surveillance quality indicators (non-polio AFP rate, stool collection rate, and average time from onset to investigation) between districts in different security phases does not show significant differences.
- There is good collaboration and coordination between the WHO Immunization Preventable Disease (IPD) Programme and government staff at all levels.

- There is improved communication and coordination with border areas of India on supplementary immunization activity (SIA) planning and AFP notification. However, some delays in cross-border AFP notification still occur.
- Surveillance Medical Officers are often required to travel long distances by road to complete AFP investigations. They have no insurance coverage in case of accidents.

### **Immunization**

- There is evidence from surveys that 10 – 15% of children were missed in recent sub-national immunization days (SNIDs). There appears to be insufficient government supervision in routine immunization sessions and in some critical SNID areas. Although Kathmandu valley should be considered at high risk because of population movement, it is not included in the current SNID plans.
- As evidenced by the high routine immunization coverage (over 100% in some border districts) and population movement, the actual population figures may be under-reported. As a result, AFP rates may also be inflated because of incorrect population figures for children less than 15 years of age.

### **Key recommendations**

- High priority should be given to improve reporting and cross notification in high-risk border districts. Weekly cross-border zero reporting should be implemented, along with immediate notification on all Nepal and India AFP cases in border districts and those that cross borders to seek health care.
- Prior to assigning SMOs with the responsibility for additional diseases for active surveillance or other tasks, a thorough evaluation of the impact on surveillance and SMO workload should be completed. In addition to the vaccine preventable disease (VPD) surveillance field guide, clear, standardized, guidance and training on VPD surveillance should be provided to all Immunization for Preventable Diseases (IPD) SMOs and routine immunization staff.

- The Female Community Health Volunteers (FCHVs) should be mobilized to raise awareness and encourage sub-health post staff and private practitioners at community levels in border areas to report AFP cases immediately to SMOs and health services.
- The improved security situation in Nepal has provided opportunities to strengthen surveillance and routine immunization coverage. Specifically, all health facilities should be visited to encourage timely AFP reporting, to conduct orientation of health staff, and to support planning, implementation and monitoring of national immunization days (NIDs). Routine immunization coverage can also be improved with special sessions and social mobilization activities, especially in the border areas.
- Remote and 'silent' areas are still at risk and will need supportive surveillance and immunization action during 2006. The surveillance quality indicators should be monitored routinely and silent areas identified for remedial action as soon as possible. This action should include supportive supervision through surveillance visits, well planned and supervised NIDs, and innovative approaches to providing routine services.
- Routine immunization support should be prioritized for districts performing poorly, and for high-risk districts and Village Development Committees (VDCs). Supervisors should monitor the completeness of sessions.
- In some areas, district head counts maintained by local health staff or FCHVs can help validate the real (target) population and should be used for better planning and monitoring.
- Results from various district immunization strategies (i.e. house-to-house, booth) should be evaluated to determine the best delivery strategy for future SIAs.
- The Kathmandu Valley should be included with the Terai region in future SIAs. The need for observing a NID in June should be discussed.
- Because of the nature of their work, insurance coverage should be provided for SMOs who are required to travel during different security phases.



# **1. Background**

## **1.1 General**

Nepal is a land-locked country with an area of approximately 147 181 square kilometers. From east to west, the approximate length of the Kingdom is 885 kilometers and varies between 145 to 241 kilometers from north to south. The country borders the two most populous countries of the world, India in the east south, and west, and China in the north.

The country is divided into three geographic regions – the Mountain zone (16 districts) makes up the northern part of the country; the Hill zone (39 districts) runs parallel to the Mountain area through the central part of the country from the east to the west; and the Terai (20 districts) zone is in the lower elevation of the country, which borders India. These three zones cover 35, 42 and 23 per cent of the total land area but comprise 7, 44 and 49 per cent of the population, respectively. The Terai region or the plains borders with the Indian states of Uttar Pradesh, Bihar, Uttaranchal, Sikkim and West Bengal. Administratively, the country is divided into five development regions and 75 administrative districts. Districts are further divided into smaller units called Village Development Committee (VDC) and municipality.

According to the projected figures based on the 2001 census, the total population of the country for the period 2004-2005 was 25 083 988. Among the religions, Hinduism is practiced by the majority of the population.

## **1.2 Health System**

The health system of Nepal comprises district hospitals, zonal hospitals, referral hospitals, nursing homes, private hospitals, primary health care centres, health posts and sub-health posts. There are 4099 government health institutions under the Health Ministry. In addition, there are 3129

sub-health posts, 697 health posts, 188 primary health care centres, 74 district and 11 zonal hospitals, three sub-regional hospitals and five central hospitals. Over 15 436 trained traditional birth attendants (TBAs), 48 354 Female Community Health Volunteers (FCHVs), 14 664 Primary Health Care Outreach sites and 15 201 EPI outreach sites are involved in the health care delivery system in Nepal.

### **1.3 Immunization**

#### ***The EPI Programme***

Nepal started the Expanded Programme on Immunization (EPI) in 1979 in three districts and extended it throughout the country by 1988. This is a top-priority programme of the Government of Nepal. The goal of the EPI programme is to reduce morbidity and mortality associated with vaccine-preventable diseases.

#### ***Polio eradication***

Nepal shares its border with polio-endemic countries such as India. It is considered at high risk for importations of wild poliovirus primarily because of its proximity to, and because of its open border with India. The last two remaining indigenous wild poliovirus endemic areas of India, namely the northern states of Uttar Pradesh and Bihar, border Nepal on the south.

Nepal joined the global polio eradication initiative in 1996, with implementation of supplementary immunization activities throughout the country (Table 1). It started the process of certification by establishing a National Certification Committee (NCC) in 1998. The NCC prepared a draft country report that was reviewed and accepted by the Region's certification committee, the International Certification Commission for Polio Eradication (ICCPE) in South-East Asia (SEA) Region, in March 2005. The country also established a National Task Force on Laboratory Containment and a task force for responding to wild poliovirus importations.

**Table 1: History of Poliomyelitis Eradication in Nepal**

1979	EPI Programme introduced in Nepal in three districts with BCG and DPT.
1988	EPI Programme expanded to all districts with six antigens including OPV.
1988	The World Health Assembly of WHO and Nepal committed to eradicate polio.
1990	The Universal Childhood Immunization year, Nepal achieved BCG coverage of over 90%.
1994	EPI basic guidelines developed.
1996	First National Immunization Days (NIDs) initiated.
1996	AFP Surveillance started through the Early Warning and Reporting System (EWARS).
1998	WHO and Polio Eradication Network (PEN) begin AFP surveillance.
1998	Guidelines for AFP investigation and reporting was introduced, including Zero Reporting.
1998	National Committee for Certification of Polio Eradication established.
1999	Non-polio AFP rate met international standard.
2001	National Expert Review Committee established.
2001	Cross-border communication and coordination between Nepal and India established.
2001	Laboratory Containment Committee formed.
2003	Measles laboratory certified by WHO.
2003	The Integrated Vaccine-Preventable Disease Surveillance Field Guide was updated to include measles and NT surveillance.
2004	Acute Encephalitis Syndrome (AES) surveillance integrated with AFP surveillance.
2004	National task force for responding to wild polio cases formed.
2005	Hib surveillance integrated in some parts of Nepal with the AFP surveillance activities.
2005	Integrated VPD surveillance guidelines updated to include Japanese encephalitis.
2005	The Polio Eradication Network (PEN), name changed to Program for Immunization Preventable Diseases (IPD).

The last case of indigenous, laboratory-confirmed poliomyelitis was isolated on 28 November 2000. However, prior to this review, importations had occurred in 2004 and 2005. In 2004, wild poliovirus type 1 was isolated from a healthy contact who had a history of travel to India within the preceding two months.

In 2005, three cases of type 1 wild poliovirus were directly isolated from AFP cases; two in Sarlahi district and 1 in Rautahat district. During contact sampling of healthy children around one AFP case (index) in Rautahat, wild poliovirus was detected (in all three samples taken), thereby rendering the classification of the index case as “confirmed wild poliovirus”. An additional three contact samples from healthy children in Sarlahi were found to be positive for wild poliovirus, however, wild poliovirus was already detected and confirmed in the index case.

As of 31 July 2006, 581 stools samples had been collected (383 samples from 202 AFP cases and 198 healthy contacts). Of these, results were available for 497 samples (326 from 160 AFP cases and 171 contacts). Only one AFP case was positive for wild poliovirus; all contact samples were negative for wild poliovirus.

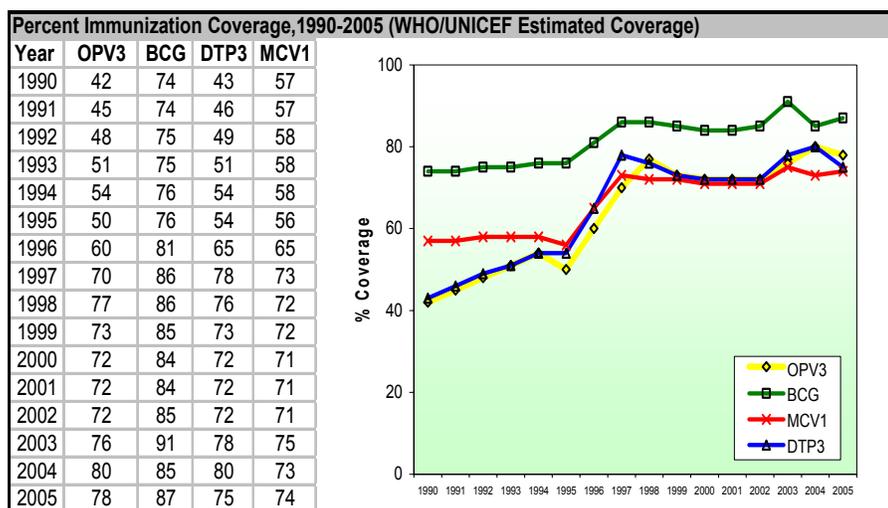
One P1 wild poliovirus was reported from Nepal on 1 May 2006 in Dailekh district in the Mid Western-Development Region with an 18 March 2006 onset. The case is a 16 year old boy in a district whose total population is about 250 000. The district is not close to the border, but reachable by road. There is no personal history of travel outside the district prior to onset of illness, but other people in the area are known to travel to India for work.

Nepal is 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):** AFP surveillance was started in 1996. At present, 410 reporting units from different administrative levels conduct zero weekly reporting. In addition, active surveillance is conducted weekly at 82 health facilities.

- **Achieving high routine OPV3 coverage:** Since its introduction in 1979, oral polio vaccine (OPV) has been an integral part of routine immunization throughout the country. Immunization services are provided through hospitals, health institutions, private hospitals, and out-reach clinics. The government reported reaching 80% coverage of OPV3 in 1995 and national coverage of 90% for the years 2003-2004 through the Health Management Information System (HMIS) system. According to WHO/UNICEF estimates, the OPV3 national coverage rose steadily during the 1990s and reached 80% in 2004 (See **Figure 1** for a summary of the WHO/UNICEF estimated immunization coverage since 1990 for four antigens).

**Figure 1:** WHO/UNICEF estimates of immunization coverage in Nepal from 1990 - 2005.



- Conducting **supplementary immunization activities (SIAs):** Nepal has been conducting national immunization days (NIDs) and sub-national immunization days (SNIDs) since December 1996 (See **Table 2** below). It has consistently reported over 90% coverage of the targeted population.

Table 2: *History of NIDs and SNIDs in Nepal, 1996 - 2006.*

Year	NIDs/ SNIDs	Number of Children Under five Years Targeted	Date of first Round	Date of 2nd Round	First Round Coverage (%)	Second Round Coverage (%)
1996/97	NID	3 232 235	6-Dec-96	17-Jan-97	117	121
1997/98	NID	3 909 229	7-Dec-97	18-Jan-98	99	100
1998/99	NID	3 860 983	7-Dec-98	18-Jan-99	94	97
1999	NID	3 849 325	21-Nov-99	19-Dec-99	94	98
2000	SNID	2 277 583	23-Jan-00	27-Feb-00	102	104
2000/01	NID	3 962 358	9-Dec-00	20-Jan-01	99	101
2001/02	NID	4 116 889	1-Dec-01	19-Jan-02	99	100
2003	NID	4 144 464	4-Jan-03	8-Feb-03	102	103
2004	NID	4 252 959	3-Jan-04	21-Feb-04	99	99
2005	SNID	444 728	7-Feb-05	12-Mar-05	99	98
2005	SNID	1 944 816	12-Mar-05	17-Apr-05	97	97
2005	SNID	475 617	7-Oct-05	12-Nov-05	99	100
2006	SNID	1796 760	21-Jan-06	21-Feb-06	98	99

### **AFP surveillance**

Surveillance for AFP started in 1996 through the government's Early Warning Reporting System (EWARS) and, since June 1998, it has been continued through collaboration with the Ministry of Health and WHO-Program for Immunization Preventable Diseases (formerly the Polio Eradication Nepal-PEN). In 2005, the name for PEN was changed to Program for Immunization Preventable Diseases (IPD). There is one National Program Officer (NPO), one National Surveillance Coordinator and 10 Surveillance Medical Officers (SMOs) in the country assisting the government with surveillance of AFP and other VPDs.

In 2004, the Nepal non-polio AFP rate was 2.15 per 100 000 population aged less than 15 years with an adequate stool collection rate of 84%. As of 31 July 2006, the 2005 non-polio AFP rate was 2.25 with an adequate stool collection rate of 84%. The 2006 annualized non-polio AFP

rate was 2.75 with 39 AFP cases pending classification (annualized AFP rate of 3.43) with an 87% adequate stool collection rate.

A Joint International and National Review of the Polio Eradication Initiative in Nepal was carried out in October 2001 and focused on AFP surveillance. Subsequent to that review, an informal review of AFP surveillance was carried out in August 2003 to specifically look at the workload of SMOs and the feasibility of integrating other vaccine-preventable diseases into the surveillance system.

## **2. Objectives/terms of reference of the review**

The terms of reference of the Review were to:

- (1) Review the status of polio eradication in Nepal and to assess whether the current strategies and structure in place for polio eradication had the potential to maintain polio-free status till regional and global certification;
- (2) Assess whether AFP surveillance was functioning adequately at all levels and all geographical areas, especially high-risk areas as per WHO guidelines and that no AFP cases were missed. This included 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 wild poliovirus importation as well as circulating vaccine-derived polio virus (cVDPV) and whether the polio eradication programme was able to mount an appropriate response;
- (4) Conduct active case searches in selected provinces and districts (or other reporting units) to find AFP;
- (5) Assess whether the quality of information collected and of documentation, analysis and reporting at national, regional and

- district levels was adequate, and whether the information was used to strengthen surveillance;
- (6) Conduct an on-site review of the laboratory procedures and work practices in the collection, storage, and transportation of stool specimens to the Regional Reference Laboratory in Bangkok;
  - (7) Review the activities of national committees involved with polio eradication, i.e. the National Certification Committee (NCC), the National Expert Review Committee (NERC), and the National Task Force on Laboratory Containment;
  - (8) Understand how integrated surveillance for other vaccine-preventable diseases, in particular measles, Japanese encephalitis, and neonatal tetanus, was being conducted and derive lessons for sharing with neighbouring countries in the Region;
  - (9) Evaluate the current scope, status and structure of the WHO SMO network, which supported AFP and other VPD surveillance in Nepal, and to 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 Nepal in 2001.

### **3. Conduct of the review**

Because of the security situation in Nepal, the extent of the review and the number of teams available to go to the field was reduced. As a result, two teams were formed composed of one international WHO reviewer and one central WHO/IPD staff. The review was conducted in two phases. First phase was in March-April 2006 in which the teams visited three of the five regions (eastern, central, and western development regions districts) and eleven districts (Kathmandu, Lalitpur, Morang, Sunsari, Kaski, Dhanusha, Sarlahi, Mahottari, Rautahat, Parsa, and Makwanpur). The second phase was in August 2006 in which the team visited the remaining two regions (mid-western and far-western regions) and four districts (Banke, Bardiya, Kailali & Kanchanpur). Although the review was smaller in scope than originally planned, the teams were able to visit the high-risk border areas

and other areas representative of the country. Specifically, The review was conducted at all administrative levels (national to village development committee level), the hill and terai ecological zones, and districts in both Phase two and Phase three security areas.

The teams travelled to the field and reviewed all available information and data on AFP and integrated VPD surveillance, routine immunization, and other VPD activities at government and teaching hospitals, District Health Offices (DHO) and District Public Health Offices (DHPOs), SMO Field Offices, and health and sub-health posts. Active case searches for AFP and VPDs were conducted in medical inpatient and outpatient records and logs, where available. Interviews were conducted at all administrative levels and with the chairman of the National Certification Committee and a member of the NERC. The cold chain and logistics for transportation of vaccines and stool specimens was assessed. Follow-up visits for AFP cases in the field and in hospitals were also completed.

Sites were primarily selected to include major municipalities, high-risk areas, border areas, and areas representing the geographic distribution of the country. Availability of transportation and logistics, security phase, and planned strikes were also considered in site selection. The review team strived to ensure that the areas reviewed were representative of all the regions in Nepal.

## **4. Findings and recommendations**

### **4.1 Main findings**

- Since it was established in 1998, Nepal has made significant progress in AFP surveillance as evidenced by the quality of work and dedication of field staff. It has addressed the recommendations made by the April 2001 Joint International Review of Polio Eradication.
- Wild poliovirus is most likely circulating in high-risk, open border areas of Nepal.
- The AFP surveillance system is sensitive enough to detect circulation or importation of wild poliovirus cases in a timely manner.

- The EPI has the capacity to respond quickly and effectively if an importation or vaccine-derived poliovirus should occur.
- The AFP surveillance system has effectively integrated other vaccine-preventable diseases (VPDs) including measles, neonatal tetanus (NNT), acute encephalitis syndrome (AES), and *Haemophilus influenzae b* (Hib) (limited sentinel sites) without diminishing the quality of AFP surveillance. However, assigning of responsibility for any additional diseases or EPI activities to SMOs will need careful evaluation, and clear and specific guidelines.
- Security is an intermittent, non-permanent obstacle for conducting quality surveillance. Security clearance is always required before SMOs can travel to the field and investigate AFP cases. A comparison of surveillance quality indicators since 2004 (non-polio AFP rate, stool collection rate, and average time from onset to investigation) in districts in different security phases did not show significant differences.
- There is good collaboration and coordination between the WHO/IPD programme and government staff at all levels.
- There is improved communication and coordination with border areas of India on SIA planning and AFP notification. However, some delays in cross border AFP notification still occur.
- The SMOs are often required to travel long distances by road to complete AFP investigations; currently, they have no WHO insurance coverage in case of accidents.

## **4.2 Surveillance Structure**

### ***Main Findings - National***

The National EPI Programme is located in the Department of Health Services (DoHS), Child Health Division (CHD), EPI Section. The AFP or polio case investigations are conducted by the WHO Immunization Preventable Diseases (IPD) [formerly known as the Polio Eradication Network (PEN)] Surveillance Medical Officers (SMOs) and District Health Officers. However, the EPI Chief, of CHD has the overall responsibility for coordinating the investigation of all AFP cases or a suspected or confirmed

case of polio. The IPD carries out its activities in close collaboration with the CHD, the Epidemiology and Diseases Control Division (EDCD) and the National Public Health Laboratory (NPHL) under the Ministry of Health and Population (MoHP). There appears to be good collaboration and coordination between the WHO/IPD and government staff at all levels.

In addition to AFP surveillance, there are two surveillance systems that collect and report vaccine-preventable disease data in Nepal. The Health Management Information System (HMIS) collects disease surveillance data monthly for CHD, EDCD, and other MoH divisions from all 75 districts. The system provides data for regularly assessing disease distribution, morbidity and mortality. Health staff in institutions record reportable communicable disease cases in their area and send the information to the District Health Office monthly. Data are compiled manually and sent to the HMIS Division of DoHS. This system suffers from weak supervision, monitoring and training and, because case definitions are not strictly followed, the quality of the data is questionable. Also, the system is not timely or sensitive enough to detect outbreaks or diseases where there are elimination or eradication goals.

The Early Warning and Reporting System (EWARS) is under the EDCD and collaborates with the Vector Borne Research and Training Center (VBDRTC). When it was started as a hospital-based, sentinel system in 1997, the intent was to monitor three vector-borne diseases – JE, malaria, and kala-azar. Now, it is based in 31 hospitals, primarily in the *Terai* zone of Nepal, and monitors three additional priority diseases including AFP, measles, and neonatal tetanus. The sentinel hospitals send weekly reports (and immediate reports in case of an outbreak) to the VBDRTC where reports are consolidated, forwarded to EDCC and published in the weekly EWARS bulletin. Like HMIS, there is limited effective supervision and monitoring at all levels and timeliness and completeness of reporting are questionable.

### ***Regional IPD network***

With the exception of the Far-Western Development Region (FWDR) which has only one SMO, there are two SMOs assigned to each of the five regions and one SMO covers the Kathmandu municipal area. Each SMO covers four (Kathmandu) to ten (northern Western Region) districts and conducts

case investigations, monitors and supervises AFP, NT, measles, and now Japanese encephalitis surveillance, and supports immunization activities in his assigned region.

### ***District***

Each of Nepal's 75 districts are composed of a District Health Office (DHO) or as they are sometimes called, a District Public Health Office (DPHO). Although it varies by district, there is a variety of reporting units including weekly zero reporting units and active surveillance sites. To help support disease surveillance there are government, teaching, and private hospitals, village development committees, primary health centers, health posts, and sub-health posts. Depending on the volume of patients and type of services provided (e.g., pediatrics), health facilities and providers are included in the AFP surveillance reporting network as routine, weekly, or active reporting sites.

### ***Female community health volunteers (FCHVs)***

The FCHVs are a key component of the health service delivery infrastructure in Nepal. These village-level health workers may be the first to come in contact with children with AFP or other VPDs, and so are critical for timely notification and referrals. They are also involved in social mobilization activities for NIDs and SNIDs, routine immunization, and micro planning.

### ***Stool transport***

Stool samples are usually collected in hospitals where the AFP case is hospitalized and then referred using a reverse cold chain to the National Institute of Health, in Bangkok, Thailand. The vaccine carriers used for transportation of stool samples are labelled and appear adequate.

### ***Recommendations***

- The FCHVs should be mobilized to raise awareness and encourage health institutions and private practitioners at community levels in border areas to report AFP cases immediately to SMOs and health services.

- Unless circumstances change substantially in 2006, no additional AFP surveillance review is required this year. Ongoing monitoring of the sensitivity of the surveillance system should continue and the need for another AFP review in 2007 assessed.

## **4.3 Surveillance systems**

### ***Main findings***

AFP surveillance is well established in Nepal and, although integrated with other disease reporting, it has special status as evidenced by the monitoring of specific performance indicators, zero reporting, and active surveillance. Public health staff appear motivated, conscientious, well trained, and aware about AFP notification and investigation procedures at all levels - even among the FCHVs working at the village level. As discussed earlier, the SMOs are key focal persons for AFP surveillance in the districts/regions.

After PEN was established, guidelines specifically for AFP surveillance were developed in 1998. These were updated in 2003 and again in 2005 to include additional priority VPDs. The guidelines and manuals for AFP and EPI surveillance activities were readily available in the SMO field locations visited. Display of EPI data, including spot maps of AFP cases and surveillance indicators were prominently displayed. Polio eradication and AFP posters were also noticeable at all levels including the sub-health posts.

The different components of the AFP surveillance system are described below.

### ***Immediate reporting***

Health staff appears to understand that the SMOs should be contacted immediately by phone. AFP posters with symptoms and contact information are displayed in prominent places. The SMOs are well known to local hospital and all understand the importance of immediate reporting and investigation. The need for immediate reporting of AFP cases appears to be well known and practiced by most people at all levels. However, instances of delayed reporting have been noted. Specifically there are delays in reporting from private practitioners not in the reporting network. Many patients consult with private practitioners or healers first before seeking care in government services. In border areas, patients may consult with medical

practitioners in India which results in delayed reporting across the border. There are also instances of delays in reporting from health facilities that are not part of the active surveillance reporting network. This may be due to late reporting from peripheral health staff treating the AFP patient. In the past, the security situation and inability of secure travel may have delayed reporting. It is believed this situation has improved.

### ***Case investigation***

The SMOs, although always accompanied by district health staff, EPI supervisor, or local responsible village health staff in the investigation, are the primary medical examiner during the investigation. Most all AFP cases are admitted to district hospitals and, even though case investigations are usually conducted by the SMO, stool collection and transport are organized immediately. The history of contact with the health facility after onset of paralysis is sometimes not elicited or not documented in detail uniformly. Case investigation activities are clearly outlined in the handbook on Standard Procedures for Surveillance Medical Officers (2001).

### ***Active surveillance***

Weekly active surveillance visits are planned to 82 priority sites in Nepal. The number of active surveillance seems to be inadequate in far west region (only two active surveillance sites for nine districts) Other regions need to review and expand as per need. However, due to time constraints, long distances, blockades, and competing case investigations, not all sites are visited weekly. In the facilities visited, documentation of visits made by SMOs was available in the hospital and health care registers. SMOs maintain a summary of their weekly active site visits and forward a monthly summary to the central IPD office.

### ***Zero reporting***

There are 410 weekly zero reporting units in Nepal. These reporting units submit a weekly “zero” or negative case report to the concerned SMO in the regional field offices. A focal person in the reporting unit is assigned to submit the appropriate zero reporting form weekly through fax, email, or courier. Reporting units are reimbursed for expenses related to zero reporting by concerned SMOs.

## **4.4 Surveillance medical officers**

Since 1997, WHO has administered SMO networks in India (305), Bangladesh (43), and in Nepal (10).<sup>1</sup> While SMOs were initially intended to support only AFP surveillance, their terms of reference gradually expanded in all countries to include a more active role in providing assistance to polio supplemental immunization activities (SIA) and subsequently, surveillance for other VPDs. National governments, partners, and WHO have recognized the vital contribution that these networks have made to the polio eradication effort in the SEA Region. Even though high-quality AFP surveillance will be needed throughout the Region for at least another five-six years, the WHO South-East Asia Regional Office (SEARO) feels that now is an appropriate time to consider the future options for the organizational status, scope, and structure of the SMO network in countries concerned.

The SMO network in Nepal is a key component of high-quality AFP surveillance and WHO and the Nepal MoH have a substantial investment in this public health resource. SMOs investigate, report, and conduct follow-up investigations on all AFP cases and other priority VPDs. One of the primary duties of the SMO is to conduct active weekly AFP surveillance at priority sites. There are 82 sites in the country where they conduct active, regular record reviews in hospitals, primary health care centres, and health posts. In addition, they conduct immediate investigations on all AFP cases. Because of the security situation in Nepal, prior to leaving the duty station to conduct investigations or any other work, SMOs must get approval from the office of the United Nations to travel. Because of the number of districts covered by each SMO, they are often required to travel long distances and spend a great deal of time in the field. None of the SMOs has a laptop to use while working in the field.

Each SMO has an office (usually located in existing government premises), a driver and an administrative assistant. While the principal role of the SMO is AFP surveillance, many other duties have been added. The following list of tasks applies to most SMOs:

- AFP Surveillance
  - Case investigations;
  - Stool specimen collection;

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<sup>1</sup> In addition WHO provides technical assistance and financial support for other SMO networks in Indonesia and Myanmar, but the staff remain government employees.

- Reporting unit visits for active surveillance;
- Management of reporting units;
- 60 days follow-up;
- Outbreak Response Immunization (ORI), and
- Responsive community assessment.
- Supplementary Immunization Activity (SIAs)
  - Micro-planning;
  - Monitoring and supervision (Activity and Supply), and
  - Technical support for analysing SIA coverage data.
- Cross-border Activity
  - Case reporting;
  - Supervision in SIAs activity, and
  - Local-level regular meetings with India (NPSP) SMO counterparts.
- Routine Immunization Activity
  - Monitoring and data analysis of routine EPI coverage, and
  - Technical support.
- Measles-like illness surveillance
- Acute encephalitis syndrome (AES) surveillance ;
- Neonatal Tetanus (NT) surveillance;
- Reporting of emergency preparedness and response;
- Coordination with government counterparts, hospitals, private clinics, NGOs, etc, and
- Orientation and training of health staff at all levels.

There is good collaboration with government counterparts at all levels. For example, during AFP case investigations, district health officials travel with the SMO to conduct the investigations. SMOs also work with government counterparts to plan supplementary immunization activities.

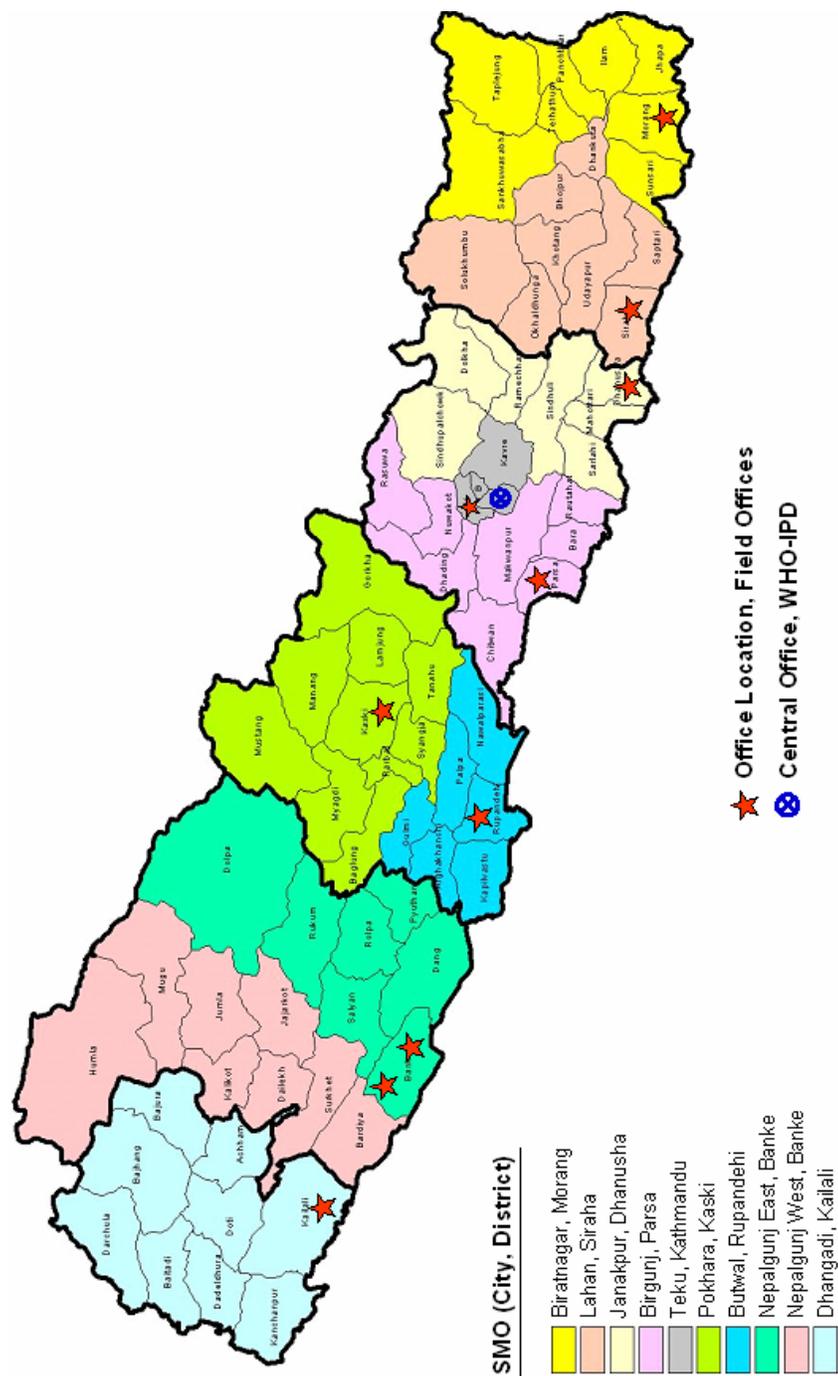
SMOs are advised to prepare a monthly work-plan to prioritize visits to reporting units. Usually, UN vehicles are allowed to travel without restrictions in Nepal. As a matter of policy, government and non-government personnel are not allowed in UN vehicles unless accompanied by UN staff (i.e. WHO staff). In some districts, this may cause problems for SMOs, as well as for maintaining a regular schedule of visiting active reporting surveillance sites.

### ***Overall Achievements of the SMO Network in Nepal***

The WHO, Nepal MoH, and the SMO network should be recognized for significant achievements including:

- The work of SMOs has been instrumental in Nepal's ability to achieve and maintain high quality AFP surveillance for polio eradication (see **Table 3** in the Performance Section).
- Ten field-based SMOs, supported by a central office, provide a reliable surveillance network for AFP, measles, acute encephalitis syndrome and neonatal tetanus (see **Figure 1** map).
- The Nepal SMO network is a real asset to the country. It reaches from village-level upwards through a very large national network of reporting units, 410 weekly reporting units, and 82 active surveillance sites.
- SMOs provide impartial data collection, analysis, and information dissemination and are a technical resource to districts for disease control and routine immunization.
- Because of their independent mobility and communication within the UN system, while subject to UN security clearance, SMOs have created a surveillance network covering all of Nepal.

Figure 1: Nepal SMO Network



### ***Current Tasks of the SMO Network***

The following is a description of the tasks of SMOs based on observation and interviews made during the AFP surveillance review.

## **4.5 AFP surveillance and supplementary immunization**

### ***Active surveillance sites***

The SMOs make weekly visits to the active surveillance sites, but their visits may be more frequent in busy city hospitals, where the SMO will receive telephone calls with a request to visit whenever a new AFP or fever and rash case is detected. Clinicians and nursing staff were found to be very familiar with reporting requirements, and the relationship between hospital staff and SMOs appeared excellent. In districts visited, the SMOs had developed working relationships with pediatricians, which enabled the suspected AFP cases to be admitted to the district hospital for investigation and stool sampling.

### ***Other reporting sites***

The AFP cases are subject to immediate reporting and all cases are usually reported to the SMO by telephone from district or sub-district levels. Most health facilities display posters on polio eradication, which provide the telephone number of the local SMO and all health staff interviewed were aware of the need to report AFP without delay. In addition, some village volunteers who were interviewed were equally aware and had actually been responsible for reporting AFP cases to their nearest health post. SMOs are involved in the investigation of every AFP case. However, they may request government staff to make the initial investigation and start stool sampling (especially in areas of insecurity where the SMO must wait for security clearance before traveling). Once security clearance has been obtained, the SMO visits the case and conducts an examination to verify AFP. Alternatively, in some instances, the SMO may request that the patient be brought to the SMO office or to a city hospital for examination; the cost of travel is refunded.

### ***Supplementary immunization***

While the responsibility for SIAs lies with the health offices at all levels, SMOs are closely involved in the micro planning, training and supervision of SIAs. They also have an important role in coordinating cross-border SIAs with India.

### ***Security issues***

The UN security system requires SMOs to obtain security clearance before visiting areas where security is compromised. There is no significant evidence to show that this has resulted in reduced surveillance quality in these areas. However, SMOs do not have a personal accident insurance provided by WHO.

### ***Routine immunization activity***

The SMOs regularly collaborate with district public health officers to monitor and analyse routine immunization data. These data are used to highlight problems of access and utilization at district and sub-district levels.

### ***Measles surveillance***

Nepal has made significant progress with measles control, through measles campaigns and improved routine immunization coverage. Surveillance for measles has been well integrated into the AFP surveillance activities; SMOs include surveillance for measles-like illness in their active surveillance visits and measles is also reported through the zero reporting system. Usually, rash and fever cases are reported and investigated by district or hospital staff, and the SMO assists with outbreak investigation. However, at one referral hospital the SMO was regularly called to conduct a case investigation of each measles-like case, 90% of which were found on laboratory testing to be due to rubella, not measles.

### ***Acute encephalitis syndrome (AES) surveillance***

Japanese encephalitis is seasonal in Nepal. Active surveillance for Acute Encephalitis syndrome (AES) is defined by fever and altered consciousness

and includes meningitis, cerebral malaria and all forms of encephalitis. Incorporated into AFP active surveillance in 2004, AES surveillance now extends to 408 reporting sites. Government staff completes case investigation forms and the line-listing is done by SMOs. Using the AFP specimen transport system, SMOs also facilitate laboratory confirmation through the shipment of blood samples to the laboratory for confirmation.

### ***Neonatal tetanus surveillance***

Active surveillance for neonatal tetanus is also carried out by SMOs. The country has a successful MNT elimination programme, which was validated in 2005. School Immunization with TT vaccine was started in 2005 in eight districts, and will be expanded to an additional 16 districts in 2006.

### ***Other surveillance duties***

The SMOs are also involved in active surveillance for Haemophilus influenzae type b (Hib) at selected sentinel sites, and at the time of this review guidelines on avian influenza surveillance were being prepared by the WHO IPD office.

## **5. Cross-border activity**

### **5.1 Planning SIAs**

Informal meetings are arranged between SMOs who drive across the border either way, and discuss joint planning for SIAs. Detailed microplans have been developed, including maps with the location of static booths, transit teams and mobile teams on both sides of the border for the duration of five days corresponding to the scheduled SNID or NID. The cooperation extends to the provision of banners and promotional material prepared in India using the Nepali language.

### **5.2 Cross-border AFP surveillance**

In districts bordering India, the population often seeks health care on both sides of the border, usually in the private sector. This can lead to delays in

reporting until the case comes in contact with government health services. Following the annual 2004 and 2005 cross-border meetings of India and Nepal SMOs, there has been progress in establishing a system to improve communication on AFP cases crossing the borders. However, there are still some delays in notification. Two of the four 2005 polio cases were subject to delays in reporting from India to Nepal.

- The first case was reported in India on 9 August 2005, but Nepal was not notified until 20 September 2005.
- The fourth case was reported in India on 26 October 2005, but Nepal was not notified until 25 November 2005.

SMOs in Nepal often communicate with their counterparts in India. However, they expressed the need for more frequent and systematic communication.

## **6. SMO network: conclusions**

### **6.1 AFP surveillance**

- AFP surveillance remains a priority for SMOs; they are well known in the communities they serve, and enjoy an excellent level of cooperation with district health staff. Thanks to their dedication and the extent of their network, there is widespread awareness within the health system of the need to report AFP cases without delay. However initial patient consultation with the private or informal health sector may delay timely reporting and investigation.
- The AFP surveillance workload of SMOs far exceeds that which is reflected in the AFP rates. Many suspected AFP cases may be investigated but then discarded as non-AFP. However, if the case has been investigated and stools samples collected, these cases need not be discarded. Stool samples can provide useful information on the status of poliovirus circulation even if taken from healthy children. Also, discarding these cases does not give a true picture of the SMO workload or sensitivity of AFP surveillance.

## **6.2 Cross-border coordination with India**

- Coordination on SIAs through SMOs in India and Nepal is working well; detailed microplans are shared and there is a real effort by both countries to ensure no children are missed, regardless of origin.
- For AFP surveillance, delayed reporting, investigation and communication of cross-border cases has been well documented, and constitutes a potential threat to the programme.

## **6.3 Routine immunization**

- Many observers have concluded that the strong routine immunization programme in Nepal has been instrumental in preventing the re-establishment of wild poliovirus transmission in the country. This review was able to document the SMO involvement in routine immunization strengthening; the mapping of performance by VDC (sub-district) is particularly impressive.
- Even though SMOs are not directly involved in implementation of routine immunization, their detailed analyses of indicators are very powerful tools to sustain coverage and alert districts to problems that need correction, especially if it includes monitoring of session implementation.

## **6.4 Measles surveillance**

- The SMOs conduct active surveillance for measles-like illness, which can be used to detect outbreaks and is in line with the national goal to reduce measles mortality by 50 % compared with the 2003 levels. Since Nepal and the SEA Region do not have a measles elimination goal, it may be considered premature to undertake investigation of each case of measles-like illness, but to concentrate on outbreak investigation and line-listing of age, location and immunization status.

## **6.5 AES surveillance**

- The successful integration of acute encephalitis syndrome (AES) into active surveillance for AFP is providing useful information on JE incidence. This will help form the basis for introduction of JE vaccine. It is also a good model for other countries wishing to establish JE surveillance. The operational guidelines for Nepal and results to date have been well documented and are readily available.

## **6.6 Integrating other diseases into the SMO network**

- The SMO network has been very successful in integrating other vaccine-preventable diseases into AFP surveillance. However, the possibility of overloading the SMOs should be carefully considered. If additional diseases or syndromes are to be added to SMOs' responsibility, the guidelines should clearly define their precise role in order that the expected additional workload could be estimated and additional resources requested, if needed.

## **7. Vision**

During the review, all involved agreed that the SMO network is an asset to Nepal and that it extends far beyond polio eradication. Interviewees made suggestions on a vision for the future of the network including:

- Every effort must be made to ensure that wild poliovirus does not become re-established through importation. This will entail intensive AFP surveillance efforts, high routine immunization coverage and high-quality supplementary immunization.
- The continued status of SMOs as WHO staff is essential to maintain objectivity, mobility and communication. Ideally all SMOs should continue to work within the same WHO structure, supported and supervised by the Kathmandu IPD office. In recognition of the risks they take on the road, WHO should provide them all with accident insurance.

- The AFP surveillance at certification quality must continue through at least 2009, but it should not be necessary to increase the number of field-based SMOs. We should increase the number of SMOs to its original number of 13. In districts where there is a heavier workload, short-term contracted staff can carry out additional tasks.
- There will be a demand in the future for SMOs to become involved in new surveillance activities. The SMO already has a very busy work schedule often traveling for hours every day to make regular visits and case investigation. Fortunately they have been able to take on surveillance for other VPDs without loss of AFP surveillance quality. However any new surveillance activities must be very clearly defined and tested to ensure that they do not compromise their current tasks.
- As the country moves towards improved surveillance for other non-vaccine-preventable diseases, SMOs will have the experience to train MoH staff in a variety of functions including data collection and analysis.
- Ensuring high routine immunization coverage is equally important as surveillance and SIAs. All SMOs should be regularly engaged in supporting routine coverage and surveillance data analysis and problem solving at district level. Laptop computers should be provided to facilitate data analysis and display during field visits.

### **Future funding issues**

It is beyond the scope of this report to discuss future funding of the SMO network in detail. However the AFP Review Team did discuss the issue with the MoH and the WHO Representative, Nepal. The Nepal IPD budget for 2007 is approximately USD 1.5 million. The cost of salaries for WHO SMOs and their support staff amounts to approximately USD 500 000. However, other items in the budget are not necessarily specific to SMOs or polio eradication, and could be paid for out of the Nepal Sector Wide Approach (SWAP) funding mechanism.

## **8. Recommendations**

- Establish formal, weekly cross-border zero reporting between SMOs in India and Nepal. The SMOs in border areas should establish weekly cross-border zero reporting together with immediate notification between the SMO networks in India and Nepal.
- The SMOs on both sides of the border should also meet with private practitioners and healers in the border area in order to notify the nearest health facility when an AFP case is encountered.
- To ensure timely reporting and data analysis by SMOs, they should be provided with laptop computers.
- The SMOs should maintain a regular schedule of their visits to active surveillance sites as a priority.
- If stools samples have been initially taken from a suspected AFP case, the case should not be removed from the AFP database. Stool samples can provide some useful information on the status of poliovirus circulation even if taken from healthy children.
- The SMOs should extend the analysis and display of district and sub-district routine immunization indicators to every district. The best approach will be through monthly meetings and supportive supervisory visits.
- The IPD should re-evaluate measles surveillance activities and consider concentrating on outbreak investigation and line-listing of age, location and immunization status.
- Funding issues need to be followed up by both the country office and the Regional office.

## **9. Reporting culture of surveillance**

### **9.1 Main findings**

AFP surveillance has been well established in Nepal since 1996 and has provided a sound base for the integration of other VPD surveillance.

Awareness is high at all levels of the health system about AFP notification and investigation procedures. There appear to be no barriers to health services except in some of the remote areas and possibly during strikes and blockades.

There appears to be good health-seeking behaviour of mothers, which would result in most AFP cases being identified. However, families may sometimes consult traditional healers before presenting at the health clinics and this could result in delays. (See section below on system performance)

## **9.2 Cross-border reporting**

The SMOs and central-level EPI staff from India and Nepal meet annually to review and improve cross-border AFP reporting, notification of polio cases, and SIA planning. Steady progress has been made and border SMOs have informal communication with counterparts on a regular basis. However, gaps in cross-border reporting have been noted among the wild poliovirus cases reported in Nepal in 2005 (as discussed above). Two recent polio cases were delayed by as much as 30 days. Delayed notification of these cases seriously threatened timely outbreak response.

In 2004 and 2005, 57 AFP cases whose usual residence is Nepal were identified and notified by India. On the other hand, seven AFP cases with usual residence in India were identified and notified in Nepal. To date in 2006, six AFP cases from Nepal have been identified and investigated in India while only one AFP case from India has been identified in Nepal. With the open borders between India and Nepal, timely and immediate reporting of AFP and hot cases, as well as of wild poliovirus is critical.

## **9.3 Recommendations**

- Mobilize the Female Community Health Volunteers (FCHV) to raise awareness and encourage sub-health posts and private practitioners at the community level in border areas to report AFP cases immediately to SMOs and health services.
- The SMOs should continue to increase awareness on AFP among private practitioners, traditional healers and local community health staff and leaders, in order to improve timely notification and investigations.

- Documented weekly cross-border zero reporting and immediate notification of all cases in India and Nepal should be established between cross-border SMO counterparts. Timeliness and completeness of these reports should be reviewed quarterly and discussed during the annual cross-border meetings.

## **10. Surveillance performance**

### **10.1 Main findings**

Since 1999, Nepal has met the international AFP surveillance standard minimum quality indicators: (i) non-polio AFP rate of 1.0 per 100 000 in children less than 15 years of age and (ii) 80 % adequate stool collection rate (per cent of AFP cases with two specimens, 24 hours apart and within 14 days of paralysis onset). See Table 3 for a summary of the surveillance quality indicators since 2001 to July 31 2006.

The 2005 meeting of the SEAR Technical Consultative Group (TCG) recommended a new target non-polio AFP rate for the Region. The new target is two per 100 000 children under 15 years. Nepal has met this rate at the national level since 2004. However, in 2005, there were 26 silent districts (districts not reporting AFP cases) in Nepal and 14 districts with AFP cases where the adequate stool rate was below 80%. Similarly, in 2006, there are 30 districts, which are silent and have not reported a single case till July 2006 this year and nine districts with stool collection below 80%. However, over a five-year period most of the districts have reported at least one case of AFP.

As evidenced by the high routine immunization coverage of over 100% in some border districts, underestimated target population for immunization, and border migration, the actual population figures used in some districts may be under reported. Therefore, AFP rates, especially in the terai zone, may also be over inflated because of incorrect population figures for children less than 15 years of age.

**Table 3: Surveillance Quality Indicators, Nepal 2001 – 2006**  
(as of 31 July 2006).

Indicator	2001	2002	2003	2004	2005	2006
AFP Cases	175	191	192	214	230	202
Wild Polio	0	0	0	0	4	1
Compatibles	0	1	1	0	2	0
AFP Rate <sup>1</sup>	1.83	1.99	1.91	2.15	2.31	3.43
Non-Polio AFP Rate <sup>2</sup>	1.83	1.98	1.9	2.15	2.25	2.75
Adequate Stool Collection Rate <sup>3</sup>	83%	87%	86%	84%	84%	87%
Total Stool Samples Collected	367	387	374	378	393	383
Per cent of non polio enteroviruses	28.0	32.0	19.0	29.0	21.0	25.0
Per cent of laboratory results reported Within 28 Days	99.0	98.0	100.0	100.0	100.0	84.3

<sup>1</sup> Number of AFP cases per 100 000 children under 15 years of age. 2006 AFP Rate annualized as of week 30, 2006.

<sup>2</sup> Number of discarded AFP cases per 100 000 children under 15 years of age. The 2006 non-polio AFP Rate annualized as of week 30, 2006.

<sup>3</sup> Percent with two specimens 24 hours apart and within 14 days of paralysis onset.

## 10.2 Recommendations

- The Surveillance Coordinator and field SMOs should routinely analyse the AFP surveillance data at sub-national levels with specific attention to silent and underperforming areas. Districts with smaller populations (less than 100 000 children under 15 years of age) can be grouped together with other nearby districts to assess whether geographic areas are meeting the surveillance quality indicator.
- Reasons for delays in notification and inadequate stool collection need to be analysed regularly for each district and SMO unit, documented, and then corrective action initiated.
- Identify informants in private sector including border areas and include in the reporting network.

- Review active surveillance network to expand where needed especially far west region.
- Mobilize FCHVs to raise community awareness to report AFP immediately (can use NIDs)
- Take advantage of improved security situation in Nepal to visit all health facilities to encourage timely AFP reporting and conduct surveillance orientation for all health staff.
- Establish weekly cross-border zero reporting between India and Nepal SMOs by email.
- In districts with extremely high immunization coverage, the impact that underreported population figures may have on AFP rates should be assessed. The district head counts maintained by local health staff or FCHVs can help validate the real (target) population for better planning and monitoring.

## 11. Integration of vaccine preventable disease surveillance

The AFP surveillance system has effectively integrated other vaccine-preventable diseases (VPDs), specifically measles, neonatal tetanus (NNT), acute encephalitis syndrome (AES), and *Haemophilus influenzae b* (Hib) without adversely affecting the quality of AFP surveillance. Hib surveillance has been established in limited sentinel sites with plans for expansion.

The integration of other VPDs into the Nepal AFP surveillance system is a model that could benefit other countries. The written AFP Guidelines were updated with new case definitions and appropriate reporting forms were created as new diseases were added. The successful mechanisms for AFP surveillance, i.e. routine zero reporting, active case searches, specimen transport, and orientation and training are now successfully being used for other VPDs.

However, with additional duties related to integrated VPD surveillance and immunization activities having been added to the SMO workload, additional training may be required. Steps to operationalize the guidelines should be clarified and standardized across the country. For example, in some areas, SMOs received phone calls on each suspected

measles or fever and rash case that presented at hospitals in the catchment area under their jurisdiction. They then proceeded to investigate each case. In other districts, the SMO only investigated cases when there was a suspected measles outbreak. Different health care providers in that region had different perceptions of what constituted an outbreak for notification to the SMO.

### **11.1 Recommendations**

- Responsibilities for any more diseases or other EPI activities that are added to the SMO workload should be carefully evaluated. Moreover, standard, specific and clear guidelines should be provided to all SMOs.
- In addition to the written surveillance guidelines, on the job practical field training should be provided to the SMOs either by central IPD or by a short period of overlap with an experienced and knowledgeable SMO on how to operationalize and standardize the guidelines.

## **12. Implementation of recommendations from previous AFP surveillance review (2002)**

Progress has been made in implementing some of the recommendations from the International AFP Surveillance Review held in Nepal in 2001. The National Expert Review Committee and the National Certification Committee are both active and help guide the eradication effort in Nepal. The SMOs continue to prioritize reporting units and active surveillance sites and provide support to routine immunization, SIAs and micro-planning. The IPD has developed operational guidelines for responsive mop-up to wild poliovirus importations and routinely communicate with SMOs in neighbouring districts of Bihar and UP (India).

There is still room for improvement on some of the other recommendations. Specifically those recommendations concerning strengthening oversight, monitoring and supervision of field activities and on-the-job training of SMOs can be improved further. Orientation and refresher courses for major reporting units and high-priority and low-performing reporting units and districts can also be improved. Although polio eradication is a priority of the MoH and specifically the Child Health

Division, it is not clear if regular monthly meetings have been established to exchange information on operational issues and the status of the programme. Regular monthly meetings could have a substantial positive impact on the programme and would help avert complacency as polio eradication nears the end.

### **13. National polio laboratory (NPL)**

There is no national polio laboratory in Nepal. The Regional Reference Laboratory in Bangkok, Thailand serves as the national laboratory for enterovirus isolation and identification. Nepal sends stool specimens every Wednesday by Air Cargo to the National Institute of Health (NIH) laboratory in Bangkok. In 2005, the laboratory processed 393 AFP specimens and 131 contact specimens. Twenty-one per cent of AFP cases and 34% of contact specimens were positive for non-polio enterovirus (NPEV). All reports were received within 28 days of receipt of the stool specimen in the laboratory.

Reports are received via fax from the Bangkok NIH laboratory. Sometimes these laboratory results are misplaced or faxed to the wrong number. There is no electronic line list or communication of laboratory results.

#### **Recommendations**

- Electronic transfer of line lists and laboratory results should be initiated between Nepal and NIH, Bangkok. Electronic transfer could also facilitate linking of laboratory results to the AFP database for updating. This would eliminate unnecessary data entry and errors.

### **14. National certification committee**

The National Certification Committee for Polio Eradication (NCC) has been operating since 1998 and is performing with a high level of commitment of its Chair and members. The NCC works in close collaboration with IPD which serves as the Secretariat. The membership currently comprises five members, including the Chairperson. The national documentation on polio eradication was submitted to the WHO Regional Office for review and

presentation to the International Certification Committee for Polio Eradication (ICCPE) at its meeting in March 2005. At that time, the Manual of Operations was accepted and only annual updates are required.

The NCC should be commended for the strong leadership provided to the polio eradication programme in Nepal. Since December 2004, the NCC members have conducted five visits to the field to review and assess the AFP surveillance system. During these visits to districts, hospitals, field offices, village development committees, and outreach clinics, they observed polio eradication activities, immunization campaigns and interviewed health staff at all levels.

### **Recommendation**

- Members of the National Certification Committee should continue to participate in the programme evaluation activities such as surveillance reviews and EPI Programme reviews and file the annual updates.

## **15. National expert review committee**

The National Expert Review Committee (NERC), established in 2001, is involved in determining the final classification of all AFP cases with inadequate stools. The NERC is composed of five senior and renowned paediatric professionals. The WHO/IPD serves as the Secretariat for the NERC and organizes periodic meetings to review cases.

### **Recommendation**

- The National Expert Review Committee should continue to review all AFP cases with inadequate stool specimens.

## **16. Laboratory containment of polio viruses**

There are no laboratories in Nepal storing wild poliovirus infectious materials. This was confirmed during the nationwide surveys and pilot tests conducted by the National Task Force on the Containment of Laboratory Stocks of Wild Poliovirus. Members of the National Task Force of

Laboratory Containment visited the bio-medical laboratories to verify the survey information collected.

## **17. Plan of action for responding to polio outbreak**

In 2004, Nepal developed a plan to respond to an outbreak due to wild poliovirus and vaccine- derived paralytic poliomyelitis. This plan was incorporated into the 2005 Field Guide for Surveillance of Vaccine-Preventable Diseases.

In 2005, the Advisory Committee for Polio Eradication (ACPE), the global oversight committee for polio eradication, recommended that the national response to importation of wild poliovirus or the emergence of circulating vaccine-derived polioviruses (cVDPV) be modified to include the following principles: (i) rapidity - planning should be done very rapidly (with 72 hours after confirmation), and the campaign should be carried out within one month of confirmation; (ii) size - the campaign should be large and target two-five million children; (iii) quality - the campaign should administer vaccine on a house-to-house basis, maintaining the highest possible quality; (iv) duration - at least three rounds of campaigns should be planned; and (v) vaccine - monovalent type 1 or type 3 OPV is the vaccine of choice for control activities. These recommendations were published in WHO's Weekly Epidemiological Record (WER - 2005). In February 2006, Nepal updated its plan to be consistent with the WER recommendations.

### **Recommendation**

- Nepal should continue to review its Plan of Action for Responding to Polio Outbreaks in order to ensure that it is up to date with the latest WHO and ACPE recommendations.

## **18. Routine immunization**

There has been significant achievement in routine immunization in Nepal in the past 10 years as evidenced by the decrease in the burden of vaccine-preventable diseases. Nepal has reported a national coverage of above 80% since 1995. In 2004, Nepal estimated the national OPV3 coverage to be 90.2%, ranging from 77.5% in the mountain zones to 99.2% in the terai zone.

Detailed analysis of coverage and drop-out rates at all levels is undertaken regularly; SMOs provide technical assistance in data analysis and monitoring.

Coverage in some districts declined in 2005. Some Village Development Communities (VDCs) have consistently performed poorly with little improvement despite the information on performance being available. Some scheduled immunization sessions have been irregular for various reasons including stockouts in 2005, strikes and blockades. There also appears to be a lack of consistent and supportive supervision by district health officials. Some FCHVs and vaccinators at the community level have reported that they are rarely visited by supervisors.

A number of districts, specifically in the terai zone, reported a greater-than-100% coverage (some as high as 345%) in 2005. The high coverage rates apparently resulted from the use of official (government) birth cohort population figures. There is significant movement of population across the open border with India. The Nepal coverage figures may be inflated because of the large number of Indians being vaccinated in Nepalese health centres or because of incorrect population figures.

### **Recommendation**

- Routine immunization support to the poor performing and high-risk districts, VDCs and border districts should be prioritized.
- Supervisors should monitor the immunization sessions, completeness and develop a regular visit schedule.
- In some areas, district headcounts maintained by local health staff or FCHVs can help validate the real (target) population for better planning and monitoring, and better coverage estimates.

## **19. Supplementary immunization activities**

Nepal has successfully conducted national immunization days (NIDs) since 1996 and reduced the burden of polio to zero in 2000. It has developed good collaboration with India to synchronize sub-national immunization days (SNIDs). In the terai zone specifically, there is good collaboration with cross-border SMO counterparts on micro-planning, conducting border

booths, ice-pack sharing, finger-marking and other routine activities necessary for successful supplementary immunization activities (SIAs). India provides Nepal with posters and other “information, education, and communication” (IEC) materials in the local language. Nepal in turn provides vaccinations to all children who present during immunization days, including Indian children.

However, there is evidence from surveys that some 10 – 15% of children were missed in a recent SNID. There appears to be insufficient government supervision in some critical SNID areas. Although the Kathmandu valley should be considered at high risk because of population movement, it is not included in the current SNID plans.

Nepal conducted rapid response to recent cases with three mop-up campaigns in 2005 and two SNIDs in 2006. It was able to quickly mobilize appropriate outbreak-response SIAs.

### **Recommendations**

- Results from various district immunization strategies (i.e. house-to-house, booth) to determine the best delivery strategy for future SIAs should be evaluated.
- The Kathmandu valley should be included with the terai zone in future sub-national rounds of SIAs.
- As of 31 July 2006, three consecutive NIDs are planned for September, October and December. However national rounds will also be required in 2007 and 2008, to ensure high immunity in the population.

## **20. Conclusion**

The Nepal Ministry of Health, Department of Health Services should be commended for an efficient and well-integrated AFP surveillance, strong EPI coverage, and commitment to polio eradication. All these areas appear to have been strengthened over the last several years due to strong leadership and motivated staff at all levels. However, it is likely that wild poliovirus continues to circulate in high-risk areas of Nepal.

## **21. Acknowledgements**

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