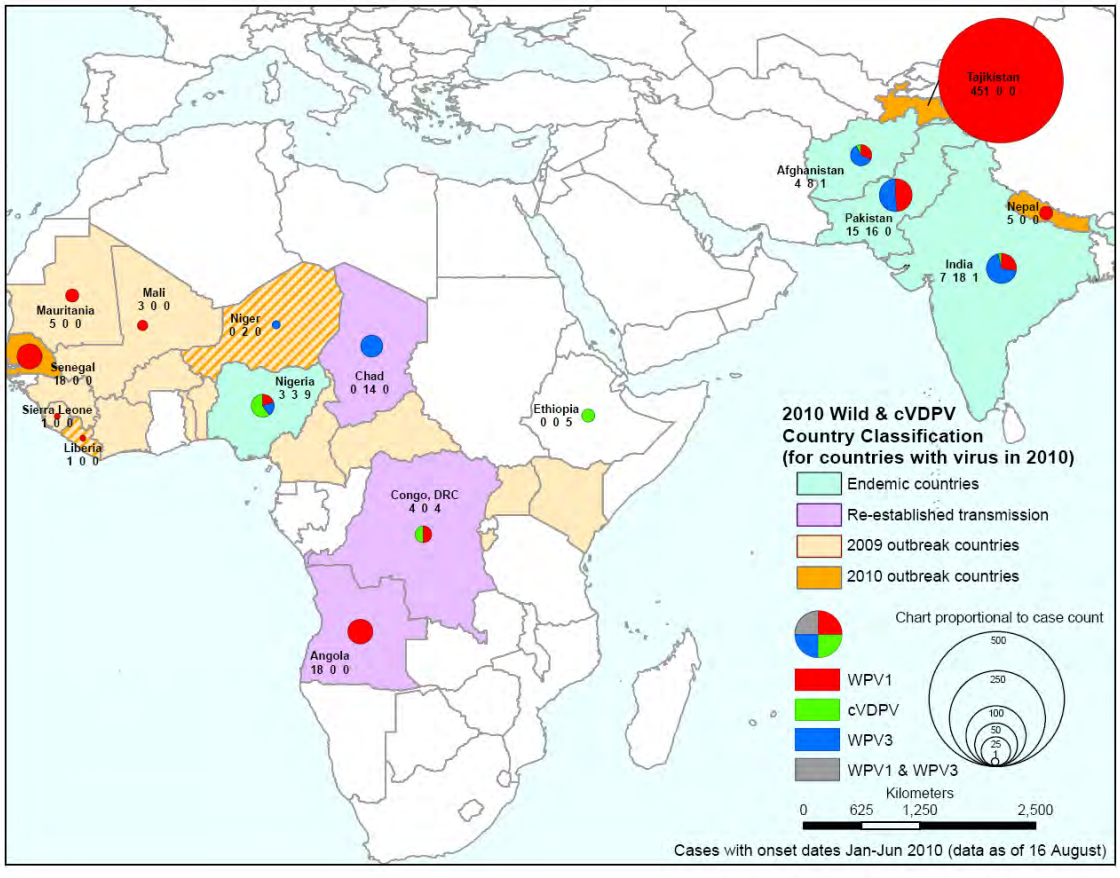
CDC ASSESSMENT OF RISKS TO THE GLOBAL POLIO ERADICATION INITIATIVE (GPEI) STRATEGIC PLAN 2010-2012

14 Sept-10

2010 First and Second Quarters (January – June)

Geographic distribution of wild poliovirus (WPV) cases by serotype and of circulating vaccine-derived polioviruses (VDPV), onset during January–June 2010 (data as of 16 Aug. 2010)



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EXECUTIVE SUMMARY

This is the first CDC assessment of risks to the GPEI Strategic Plan 2010–2012, covering program activities and wild poliovirus (WPV) cases with onset January–June 2010 (exceptions noted). These assessments are grouped by countries with outbreaks following importation or those at high risk of importation (**importation countries and the Africa "importation belt"**); countries with re-established WPV transmission after previously being polio-free (**re-established transmission countries**); and countries in which indigenous WPV transmission had never been interrupted (**endemic countries**).

Introduction

The GPEI Strategic Plan for 2010–2012 proposes aggressive, time-bound milestones and stringent process indicators that target both high immunization coverage and quality surveillance. While many countries have previously eradicated polio without fulfilling all these strict targets, empiric evidence demonstrates that success in substantially reducing the susceptible population and detecting all chains of transmission is essential to meeting the global goal. Based on the targets set by the Strategic Plan, this report considers failing to reach each process indicator as a serious risk to success. Mitigating factors (such as strong political support or evidence of prior capacity to stop transmission) can enhance a country's achievement of the goal and these should ultimately result in demonstrable progress toward meeting the indicators.

The Global Polio Eradication Initiative Strategic Plan 2010–2012 Milestone		Target Completion Date
1	Cessation of all WPV outbreaks with onset in 2009 following importation[1]	mid-2010
1a	Cessation all new outbreaks following importation within 6 months of confirmation	2010 to mid-2012
2	Cessation of all re-established[2] WPV transmission[3]	end-2010
3	Cessation of all WPV transmission in at least 2 of 4 endemic countries[4]	end-2011
4	Cessation of all WPV transmission[5]	end -2012

The Strategic Plan is intended to consolidate the progress made in stopping the outbreaks in West Africa following importation in 2009 and the marked reduction in the number of cases and affected districts in India, Nigeria, and Sudan as 2010 began. In these and most of the other large countries among the re-established transmission and endemic countries, transmission appears to be primarily related to limited geographic areas or to high-risk sub-populations such as migrants. The risk of transmission continues and can remain high in each

[1] Validated when ≥ six months without a case genetically linked to a 2009 importation (i.e. by end-2010). The target for stopping any new outbreaks (i.e. with onset in 2010, 2011, or 2012) will be within six months of the confirmation of the index case.

[2] previously polio-free countries (no WPV cases detected for ≥12 months) that experienced WPV importation events during or before 2009 which resulted in persistent transmission for ≥12 months

[3] Validated when ≥ 12 months occurs without a case genetically linked to the re-established virus (by end 2011).

[4] Validated when ≥ 12 months occurs without a case genetically linked to an indigenous virus (by end-2012); the year-to-year change in the number of polio cases will be monitored quarterly for each endemic country to guide the assessment of progress towards this global milestone.

[5] validated when 12 months occurs without a case genetically linked to an indigenous virus (by end-2013).

country as long as there is evidence of systemic immunization and surveillance weaknesses in key sub-national areas and vulnerable high-risk groups. Based on supplementary immunization activity monitoring and surveillance data reported as of 3 August 2010 and epidemiologic and laboratory data reported through 16 August, countries are assessed in this report on both the level and trend in their risk of failure to detect and interrupt WPV transmission. These assessments can provide input to determine the status of achieving the Milestones laid out in the Strategic Plan and to indicate program areas potentially requiring further attention.

Overall Risk Assessment

An overall assessment of the global situation based on the current risk analysis indicates the following priorities in order to meet the projected Milestone targets:

Among the 2009 importation countries, the main source of reported cases, and the focus for meeting Milestone 1, appears to be along the Mali-Mauritania border. While both countries have shown marked improvements in performance, ongoing gaps in surveillance and sustained SIA quality indicate the need to focus efforts especially on Mauritania. The remaining countries in West Africa have been polio-free for >6 months, but some warrant further demonstrations of SIA quality (Burkina Faso, Cameroon, Central African Republic, Sierra Leone, Togo) or aspects of surveillance quality (Guinea-Bissau and others) to reduce their risks. Overall risks of failure to detect and interrupt WPV transmission within 6 months of confirmation in all 2010 importation countries (Liberia, Niger, Senegal, Nepal, and Tajikistan) appear to be generally low or moderate, and are stable or decreasing to date. While concern remains high across the re-established transmission countries given their prior systemic gaps and history of WPV exportation, evidence of persistent transmission throughout Angola and in eastern Democratic Republic of the Congo indicate increasing risk of failure to interrupt transmission by the end of 2010, Milestone 2. Meeting Milestone 3 by the end of 2011 will require consolidation of recent gains made in both Nigeria and India by focusing on sub-national areas or populations remaining at risk of sustaining transmission.

Global Milestone 1 Status

Milestone 1: cessation of all polio outbreaks with onset in 2009, is the only milestone with a mid-2010 target. It cannot be validated until end-2010.

Countries with 2009 importations	Date of last WPV related to 2009 importation	Meet validation criteria now	Validation date for >6 months no cases
Benin	19 Apr 09	Yes	
Burkina Faso	25 Oct 09	Yes	
Cameroon	15 Oct 09	Yes	
Central African Republic	09 Aug 09	Yes	
Cote d'Ivoire	06 Aug 09	Yes	
Guinea	03 Nov 09	Yes	
Liberia	26 Oct 09	Yes	
Mali	01 May 10	No	01 Nov 10
Mauritania	28 Apr 10	No	28 Oct 10
Niger	28 May 09	Yes	
Sierra Leone	28 Feb 10	Yes*	
Togo	28 Mar 09	Yes	
Burundi	12 Sept 09	Yes	
Kenya	30 Jul 09	Yes	
Uganda	10 May 09	Yes	

*pending final confirmation of surveillance data through 28 August 2010

Status of Polio-Affected Countries

Note: since 16 August, the number of confirmed cases in Tajikistan has risen to 456; the Russian Federation has officially reported a total of 11 confirmed cases in seven locations, including the northern Caucasus republics; a case in Bihar state, India has been reported, the first since October 2009; and a case in northern Afghanistan has been reported.

Importation Countries and the Africa "Importation Belt"

West and Central Africa

There are 16 "importation belt" countries in west and central Africa with an historically high risk of WPV importations. Of the 12 countries in this belt with outbreaks in 2009 due to imported WPV:

- In seven (Benin, Burkina Faso, Cameroon, Central African Republic, Cote d'Ivoire, Guinea, Togo) there have been no confirmed cases in the first 6 months of 2010.
- In three, WPV cases continued to be detected in 2010 (Mali – onset of most recent case 1 May, Mauritania – onset of most recent case 28 April, and Sierra Leone – onset of most recent case 28 February). There is a high risk of failure to detect and interrupt transmission by mid-2010 in Mauritania because of not yet reaching <10% missed children in two SIA rounds and weak surveillance performance, and a low risk in Mali which has strong immunization and intermediate surveillance performance; these risks are decreasing as long as SIAs continue and quality of implementation is maintained or improved. Sierra Leone appears to have interrupted transmission, although a full six months of surveillance data are not yet available by the date of this report.
- In two (Liberia and Niger), there have been no 2009-related WPV isolated in 2010, although both have reported unrelated, confirmed WPV cases during Jan–Jun 2010 that represent new importation events in 2010. Liberia may have already interrupted transmission with onset on 3 March, although a full six months of surveillance data are not yet available by the date of this report and indicators of surveillance performance are intermediate. Niger has a low, decreasing risk of failure to interrupt transmission within 6 months of outbreak confirmation.

Of the four "importation belt" countries without an outbreak in 2009:

- In one, Senegal, there was an outbreak of 18 WPV cases in 2010 associated with three separate importation events; the onset of the most recent case was 30 April. Senegal has a low, decreasing risk of failure to detect and interrupt WPV transmission, because of indicators of strong immunization and intermediate surveillance performance.
- Three countries were unaffected during 2009–2010 (the Gambia, Ghana, Guinea-Bissau).

Caution will be needed in interpreting the latest date of WPV case onset as an indicator of the end of transmission in west and central Africa because of overall suboptimal surveillance performance in the majority of countries. There is a risk of recurrent outbreaks following WPV importation until the last country in the area interrupts transmission.

East Africa

For the three countries that had outbreaks in 2009 due to imported WPV (Burundi, Kenya, Uganda), no confirmed cases have been reported in the first 6 months of 2010 and transmission appears to have been interrupted. Three countries (Eritrea, Ethiopia, Somalia) have not reported confirmed cases in 2009–2010; however, circulating vaccine-derived poliovirus (cVDPV) outbreaks have been reported in Ethiopia during 2009–2010 and in Somalia during 2008–2010.

This assessment indicates that the six countries in east Africa should be able to sustain polio-free status through 2010. However, the quality of immunization performance is weak in Ethiopia and Uganda and intermediate in Kenya and Somalia, indicating a risk of substantial transmission following WPV importation, particularly those with weak routine immunization performance (Pol3 <75%). In addition, these limitations also put these four countries at risk of future cVDPV outbreaks.

Asia

There have been two outbreaks in 2010 following importation: in Nepal and Tajikistan. In Nepal, five WPV type 1 (WPV 1) cases following two separate importations were detected, with onset of the most recent case on 9 June. In Tajikistan, 452 WPV1 cases (onset through 4 July, data as of 16 August) have been confirmed with onset of the most recent case on 4 July. Given the independent monitoring data on supplementary immunization activities (SIAs) to date, despite data indicating intermediate routine immunization, there is a high, decreasing risk of failure to detect and interrupt WPV transmission within six months of confirmation in Nepal; additional SIAs have already been implemented in July and August. Given the immunization response to date, there is a moderate, stable risk of failure to detect and interrupt WPV transmission within six months of confirmation in Tajikistan until additional SIAs are implemented. There is risk of additional importations into Asian countries associated with the Tajikistan outbreak. (Note: Cases within the Russian Federation were only reported provisionally until 1 September).

Re-Established Transmission Countries

In Angola, WPV1 of the same related lineage has been circulating since 2007 following importation from India; 18 WPV1 confirmed cases were reported with onset during January–June 2010, including 7 cases in western and central provinces and the capital and 11 cases in eastern provinces. As of 16 August, 19 confirmed WPV cases were reported. Angola has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2010 and of exporting WPV into neighboring countries because of persistent WPV transmission and involvement of newly-affected provinces in 2010, low indicators of immunization of targeted children in routine and supplementary immunization, and ongoing intermediate surveillance performance that has prevented effective tracking of WPV transmission.

In Chad, WPV type 3 (WPV3) transmission has been ongoing since importation from Nigeria in 2007; 14 WPV3 cases were identified during January–June 2010. Chad has a high risk of failure to detect and interrupt WPV transmission by the end of 2010 and of exporting WPV into neighboring countries because of long-standing persistence of transmission, weak routine and supplementary immunization performance, and weaknesses in acute flaccid paralysis (AFP) surveillance. However, the risk appears to be decreasing because monitoring data following supplementary immunization activities (SIAs) in the first months of 2010 suggest some progress in implementation.

In the Democratic Republic of the Congo (DRC), five WPV1 cases were identified during January–June 2010 in provinces of the country adjacent to Angola, as a result of two separate importation events with WPV of

Angolan origin. As of 16 August, one additional case with onset on 11 July has been reported also near the Angolan border. One confirmed case with onset 10 June was detected in an eastern province on the border with Tanzania/Lake Tanganyika. WPV isolated from this case-patient in the eastern province is most closely related to WPV isolated in DRC in 2007–2008 on virologic analysis; this undetected transmission demonstrates deficiencies in AFP detection, investigation, specimen collection and/or transport in eastern areas of the country despite surveillance performance indicators meeting targets. The Democratic Republic of the Congo has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2010 because of evident intermediate surveillance performance and weaknesses in immunization performance in eastern provinces.

In Sudan, WPV1 of Nigerian origin was imported into the country via Chad in 2004 and resulted in 147 polio cases during 2004–2005. After WPV cases were identified in south Sudan in June 2008, genomic sequence analysis indicated that the most closely related WPV1 isolate prior to 2008 was obtained from a case in Sudan in 2005. A total of 71 cases occurred during 2001-2010. The most recent case had onset 27 June 2009. South Sudan has shown substantial progress but is at a moderate, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2010, given intermediate immunization performance, intermediate surveillance performance, and past weaknesses in surveillance.

Endemic countries

In Afghanistan, poliovirus transmission has remained largely unchanged from the same period in 2009 (11 WPV cases) to 2010 (10 WPV cases). Two cVDPV2 cases have been identified in Afghanistan during 2009–2010. SIA monitoring data available for the 13 high-risk districts identified in the Strategic Plan indicate that in all 13, the target of <10% missed children has consistently not been reached in 2010 SIAs. Afghanistan has a high, stable risk of failure to detect and interrupt WPV transmission by the end of 2011 because of ongoing problems in accessing children in insecure southern areas.

In India, 25 WPV cases (7 WPV1 and 18 WPV3) have been confirmed during January–June 2010, compared with 151 (28 WPV1, 122 WPV3, 1 mixed WPV1/WPV3) during January–June 2009. As of August 16, three additional WPV1 cases have been reported from Maharashtra and Jharkhand; the most recent case (WPV1 from Jharkhand) had onset of paralysis on 22 July. The last identified WPV1 case-patient in Uttar Pradesh had onset in November 2009. The last confirmed WPV1 case-patient in Bihar had onset in October 2009. However, WPV1 related to Bihar strains have been associated with AFP cases with onset during January–June 2010 in West Bengal, Jharkhand, Maharashtra and Nepal; a Bihar strain imported into Punjab in 2009 was isolated in 2010 from a case-patient among migrants in Jammu and Kashmir. Testing of environmental samples taken within Delhi has detected both WPV1 and WPV3 on various occasions that are related to Bihar WPV strains. A total of 16 cVDPV2 cases were isolated during 2009–2010; onset of the most recent was 18 January 2010. The reduction in the number of WPV1 and WPV3 cases in India from 2009 indicates significant progress towards polio eradication. Immunization performance and surveillance performance are strong. Nonetheless, India remains at moderate, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2011 because of the multiple foci of circulation of WPV in the current season and the virologic evidence suggesting the possibility of ongoing low-level WPV1 transmission in Bihar.

In Nigeria, 6 WPV cases (3 WPV1 and 3 WPV3) were identified during January–June 2010; WPV1 cases declined from 67 and WPV3 cases declined from 290 during January–June 2009. The onset of the most recent WPV3 case was 15 June and of the most recent WPV1 case was 18 June. There have been 9 cVDPV2 cases during January–June 2010, decreased from 137 during January–June 2009. The Strategic Plan 2010

target is <10% of children with non-polio AFP with a vaccine history of 0-dose in each of the 12 high-risk states, which has been met for ten (83%) of these states; the two that failed are Kano (20% 0-dose) and Yobe (12% 0-dose) indicating weak immunization performance. Virologic analysis indicates that some chains of WPV transmission during 2009–2010 have not been detected for more than a year. This finding indicates intermediate surveillance performance despite AFP surveillance performance indicators meeting or exceeding targets. If progress in Nigeria can be sustained, WPV transmission in Nigeria could be interrupted in the near future. However, with a high proportion of 0-dose children in some areas with prior high rates of WPV, Nigeria has a high risk of failure to detect and interrupt WPV transmission by the end of 2011. The risk has been decreasing because of improvement in SIA implementation; however, potential disruptions in services during the state and federal elections planned for early 2011 could limit program progress.

In Pakistan during January–June 2010, 31 WPV cases have been confirmed, compared with 22 during January–June 2009. The number of districts affected by WPV have remained largely unchanged from 2009 (17) to 2010 (19) and are located in the *northern transmission zone* (most of Khyber Pakhtunkhwa [formerly North West Frontier Province] and the federally administered tribal areas [FATA], bordering eastern Afghanistan), and the *southern transmission zone* (bordering south Afghanistan, extending into Pakistan through Balochistan into the towns around Karachi, Sindh). Of the five SIA rounds in 2010, house-to-house SIA independent monitoring indicated <10% missed children in most districts in most rounds. The target of <15% missed children has been reached in all SIA rounds in Peshawar district in Khyber Pakhtunkhwa, the monitored districts of FATA, and one of three monitored districts in Balochistan. Among the 18 monitored towns of Karachi, house-to-house SIA independent monitoring indicated <10% missed children in five towns for all five SIA rounds to date; no other town had results from at least 4 rounds with <10% missed children. Although there were signs of progress in some areas in 2010, because of long-standing weakness in SIA implementation, and the additional uncertainty of the long-term impact of the flooding crisis, Pakistan has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2011.

Table of Contents

ACRONYMS AND ABBREVIATIONS

AFP acute flaccid paralysis

bOPV bivalent (types 1 and 3) oral poliovirus vaccine

CDC Centers for Disease Control and Prevention

GPEI Global Polio Eradication Initiative

IM independent monitoring

IMB International Monitoring Board

mOPV monovalent oral poliovirus vaccine, either type 1 (mOPV1) or type 3 (mOPV3)

NID national immunization day

NPAFP non polio acute flaccid paralysis

OPV oral poliovirus vaccine

SIA supplementary immunization activity

SNID sub-national immunization day

TAG Technical Advisory Group

tOPV trivalent oral poliovirus vaccine

UNICEF United Nations Children's Fund

WHO World Health Organization

CDC Assessment of Risks to GPEI

INTRODUCTION

The 2008 World Health Assembly called for a new strategy to reinvigorate the fight to eradicate polio.[6] Following a 2009 independent review of the challenges to eradication,[7] a new Global Polio Eradication Initiative (GPEI) Strategic Plan for 2010-2012[8] was developed, including milestones and indicators, with the aim of achieving global cessation of wild poliovirus (WPV) transmission by the end of 2012. The U.S. Centers for Disease Control and Prevention (CDC) was requested by the Interagency Coordinating Group (ICG) of major polio eradication partners to assess the risk of failing to detect and interrupt WPV transmission in WPV-affected countries during 2010-2012. CDC will report risk assessments for countries on a quarterly basis to the ICG and to the Independent Monitoring Board (IMB). The IMB will use all pertinent information to evaluate the status of progress toward each GPEI Strategic Plan milestone and indicator, develop recommendations for actions needed to achieve polio eradication, and track implementation of those recommendations. This report includes risk assessments based on data for the 6-month period 1 January – 30 June 2010 and in part on data from the one-year period 1 July 2009 - 30 June 2010. Analysis is restricted to countries included in the GPEI Strategic Plan; other countries remain at risk of substantial transmission following WPV importation and are being individually evaluated by the World Health Organization (WHO).

The GPEI Strategic Plan for 2010–2012 proposes aggressive, time-bound milestones and stringent process indicators that target both high immunization coverage and quality surveillance. While many countries have previously eradicated polio without fulfilling all these strict requirements, empiric evidence demonstrates that success in substantially reducing the susceptible population and detecting all chains of transmission is essential to meeting the global goal. Based on the targets set by the Strategic Plan, this report considers failing to reach each process indicator as a serious risk to success. Mitigating factors (such as strong political support or evidence of prior capacity to stop transmission) can enhance a country's achievement of the goal and these should ultimately result in demonstrable progress toward meeting the indicators.

Methods

Data

Aggregate country, state/province, and district level data used by CDC for the assessments presented in this report, as outlined in Annex 1[9], are from i) independent monitoring of polio supplementary immunization activities (SIAs) in selected geographic areas, and ii) Acute Flaccid Paralysis (AFP) surveillance, used to determine non-polio AFP (NPAFP) rates, the proportion of AFP case-patients from whom adequate stool specimens are collected, and the number of oral polio vaccine (OPV) doses received by each NPAFP case-patient. Comparisons of some of these data are made with WHO/UNICEF country immunization coverage

[1] available at http://apps.who.int/gb/e/e_wha61.html
[7] available at http://www.polioeradication.org/content/general/Polio_Evaluation_Report.asp.
[8] hereafter referred to as the GPEI Strategic Plan; available at http://www.polioeradication.org/content/publications/StratPlan.2010-12.asp.
[9] WPV and VDPV cases are reported with onset 1 January through 30 June 2010, using data as of 16 August 2010. Any polio cases with onset between 30 June 2010 and the release date of this report are not included in the global overview or in detailed analyses but will be noted in country risk assessments. Independent monitoring data were from SIAs conducted between 1 January and 30 June 2010. For AFP surveillance, databases as of 3 August 2010 were used for onset of AFP between 1 July 2009 and 30 June 2010.

estimates for the third routine OPV dose (Pol3) in 2009.[10] Virologic genomic sequence analyses of poliovirus isolates are provided by the Global Poliovirus Laboratory Network and interpreted by CDC for this report.

Indicators

Risk assessments presented in this report were from interpretation of "Major Process Indicators" and supported by analyses of "supplemental indicators". Major Process Indicators are set forth in the GPEI Strategic Plan (Annex 2) and are generally country-specific. The Major Process Indicators targeted for achievement by the end of 2010 are assessed in this report as achieved or not as of 30 June 2010; those Major Process Indicators that could not yet be assessed at the time of this report are noted.

Supplemental indicators are used to interpret consistency and validity of Major Process Indicators regarding immunization and surveillance performance for analysis of a country's overall risk of failing to detect and interrupt WPV transmission. Supplemental indicators for immunization performance include data on national Pol3 coverage and reviews of the OPV dose history of children 6-35 months of age with NPAFP nationally, specifically the proportion of children with no OPV doses ("zero-dose"). Supplemental indicators used to assess surveillance performance were NPAFP rates per 100,000 children <15 years of age sub-nationally when state/province population of children <15 years of age[11], the proportion of AFP cases with adequate stool specimens, and WPV genomic sequence comparisons. Sub-national NPAFP rates and confidence limits were only calculated if the population was ≥100,000; a state/province's rate was considered to be within acceptable range if the upper 90% confidence limit was ≥2.

Assessments of immunization and surveillance performance

Immunization performance is assessed as being STRONG, INTERMEDIATE, or WEAK for individual countries included in the GPEI Strategic Plan using a stepwise process that is described in detail in Annex 3. Briefly,

1. The primary emphasis is placed upon independent monitoring data from SIAs conducted in 2010, particularly in the areas specified by the Major Process Indicator for immunization in the GPEI Strategic Plan (for most countries, <10% missed children in each of a specified number of SIAs, or otherwise in the two most recent SIAs). In most countries the performance of each SIA being considered in the assessment is individually scored as strong (<10% missed children), intermediate (10-14% missed children), or weak (≥15% missed children) based upon the proportion of missed children, and then all SIA scores are considered together for the assignment of an overall score of strong, intermediate, or weak for the Major Process Indicator.

2. Secondarily, estimates of national-level routine Pol3 coverage in 2009 and zero dose OPV proportions are taken into consideration as follows:

[10] available at http://www.who.int/immunization_monitoring/routine/immunization_coverage/en/index4.html

[11] AFP surveillance quality is monitored by performance indicators that measure the sensitivity of detecting WPV transmission. Certification-standard WHO targets are a NPAFP detection rate of >1 case per 100,000 population aged <15 years and adequate stool specimen collection from >80% of AFP cases, in which two specimens are collected ≥24 hours apart, both within 14 days of paralysis onset, shipped on ice or frozen ice packs, and arriving in good condition to a WHO-accredited laboratory (not evaluated here). Sub-national data are analyzed when population size permits. Since 2005, an operational target for all countries reporting WPV and for neighboring countries has been to achieve a NPAFP rate of >2 cases per 100,000 children aged <15 years. In this report, when sub-national NPAFP rates are used, they are based upon upper 90% confidence limits.

a. National Pol3 coverage estimates of ≥90% are considered strong, 75-89% are intermediate, and <75% are weak.
b. National zero-dose OPV proportions of ≤5% are considered strong, >5 but <10% are intermediate, and ≥10% are weak.

When there are no SIA monitoring data, these two supplemental indicators are used alone for the immunization performance assessment. The scores for Pol3 coverage and zero-dose OPV are combined with the score for the Major Process Indicator for immunization for an overall immunization assessment of STRONG, INTERMEDIATE, or WEAK; details describing this process are available in Annex 3.

Surveillance performance is assessed as being STRONG, INTERMEDIATE, or WEAK for individual countries included in the GPEI Strategic Plan using a stepwise process that is described in detail in Annex 3. Briefly,

1. The primary emphasis is placed on the GPEI Strategic Plan Major Process Indicator for surveillance in all countries, i.e., NPAFP rates of >2 within the last 12 months in all sub-national areas. For each country, the proportion of sub-national areas with NPAFP rates >2 (based upon the upper 90% confidence limits) within the last 12 months was scored according to the following criteria: strong (100% of sub-national areas with NPAFP rates >2), intermediate (80-99% of sub-national areas with NPAFP rates >2), or weak (<80% of sub-national areas with NPAFP rates >2). For two countries, the Democratic Republic of the Congo and south Sudan, specific Major Process Indicators call for NPAFP>2 in all sub-national areas, and assessment will based upon the reported values, not upon the upper 90% confidence limits.

2. Secondarily, the national proportion of adequate stool samples and genetic sequence data of WPV isolates were taken into consideration as follows:
    a. National proportion of adequate stool samples: >80% (strong), 65-80% (intermediate), and <65% (weak)
    b. Genetic sequence data of WPV isolates: little evidence of missed chains of WPV transmission (little), and some evidence of missed chains of WPV transmission (some).

    The scores for proportion of adequate stools and genetic sequence data are combined with the score for the Major Process Indicator for surveillance for an overall surveillance performance assessment of STRONG, INTERMEDIATE, or WEAK; details describing this process are available in Annex 3.

Overview of Genetic Sequence Analysis

As poliovirus circulates and is transmitted from person to person, the virus mutates at a relatively constant rate. The longer virus circulates, the more mutations accumulate when compared with an original virus that was detected in the population under investigation. By examining how genetically similar viruses are it is possible to estimate how recently they came from the same "parent" virus, by using this molecular clock. Because of this genetic relatedness, poliovirus that has been circulating within a population forms lineages of closely related "chains of transmission".

The relatedness of viruses taken from infected persons identified through AFP surveillance can provide information about the sensitivity of the surveillance system. Because poliovirus mutates at a constant rate, viruses from persons connected in place and time that were detected through a sensitive AFP surveillance system should show a high degree of relatedness. If a virus does not have a close relative, however, that indicates that the particular transmission chain or chains represented by the virus has gone undetected for some time. The lower that the genetic identity of a virus is to its closest related virus, the longer the period of

silent transmission. The more detected viruses that are not closely related to their nearest genetic neighbor, the stronger the indication that there are problems with the sensitivity of the AFP surveillance system. Any WPV that appears to have been circulating undetected for more than one year (isolate >1% different from its closest relative) is a strong indicator that there may be problems with surveillance sensitivity and raises concerns about the ability to detect circulating WPV (evidence of missed chains of transmission).

Overall risk assessment

The overall CDC assessment of a country's risk of failure to detect and interrupt WPV transmission is based primarily upon the immunization performance assessment but also takes into account the surveillance performance assessment as illustrated in the table below. An overall risk of HIGH, MODERATE, or LOW is assigned to countries assessed in this report. Trends in the assigned overall risk are judged by SIA monitoring data (or for those without recent SIAs, supplemental indicators) and recent events of importance supporting a decreasing, stable, or increasing risk of failure to detect and interrupt WPV transmission.

	IMMUNIZATION PERFORMANCE		
SURVEILLANCE PERFORMANCE	**WEAK**	**INTERMEDIATE**	**STRONG**
WEAK	HIGH	HIGH	MODERATE
INTERMEDIATE	HIGH*	MODERATE	LOW**
STRONG	HIGH*	MODERATE	LOW**

*If a country is initially assessed as having a HIGH risk of failure to detect and interrupt WPV transmission but its surveillance performance is assessed as STRONG or INTERMEDIATE and there is no evidence of WPV circulation in >12 months (>6 months if importation country/"importation belt"), its overall risk will be revised to MODERATE.

**If a country is initially assessed as having STRONG immunization performance AND STRONG or INTERMEDIATE surveillance performance but there is evidence of WPV circulation within the last 6 months in ≥3 states/provinces, its overall risk will be revised to MODERATE.

Limitations

All surveillance and independent monitoring data are subject to limitations and potential biases which are taken into account to the extent possible when assessing the risk of failing to detect and interrupt WPV transmission. Independent monitoring has not been implemented in a consistent manner across countries, but generally is implemented in a way to focus on the areas of highest likelihood of weak SIA implementation. The assessment attempts to search for consistency among the data sources but this is inherently imperfect. Evaluation by choosing children in gathering places (the "outside the house" method) tends to provide a result with a higher proportion of children missed. Some surveillance performance and NPAFP polio dose history indicators may be difficult to interpret because of identified uncertainties.[12] In addition, surveillance indicators may not reveal some existing weaknesses that are subsequently revealed by WPV genomic sequence analysis; this is reflected in the assessment criteria.

[12] e.g. surveillance data with a high proportion of records missing age or vaccination history, or a high proportion of specimens arriving in the laboratory in poor condition compromising the validity of a negative result.

GLOBAL UPDATE

January-June 2010

Globally, 596 cases were reported with onset during January-June 2010 compared to 753 cases for the same period in 2009; 451 (76%) of these cases are associated with the outbreak in Tajikistan. In the endemic countries, 74 WPV cases were reported this year through 30 June, compared to 543 cases for the same period last year (an 86% reduction). Of note, as of 16 August, Sudan has not detected WPV cases in over 12 months; the onset of the most recent case was on 27 June 2009 (refer to Annex 4 for more details).

RISK ASSESSMENT

Importation Countries

West and Central Africa "importation belt" countries

		Importation belt countries (west and central Africa only)	WPV History		Major Process Indicators		Risk Assessment		
			Date of last WPV	weeks since last WPV	Immunization: #1: <10% missed children in 2 SIAs (Yes / No)	Surveillance: # 2: NPAFP rate > 2 achieved at sub-national level (Yes /No)	Immunization performance (strong, intermediate, weak)	Surveillance performance (strong, intermediate, weak)	Overall risk of failure to detect and interrupt WPV transmission (risk / trend)
west and central Africa	1	Benin	19-Apr-09	63	Yes	No	Strong	Intermediate	Low: stable
	2	Burkina Faso	25-Oct-09	36	No	Yes	Intermediate	Intermediate	Moderate: stable
	3	Cameroon	15-Oct-09	37	No	No	Weak	Intermediate	Moderate: stable
	4	Central African Republic	09-Aug-09	47	No	Yes	Weak	Strong	Moderate: stable
	5	Cote d 'Ivoire	06-Aug-09	47	Yes	No	Strong	Intermediate	Low: stable
	6	Gambia	last WPV in 2000		Yes	no data	Strong	Strong	Low: stable
	7	Ghana	08-Nov-08	86	Yes	No	Strong	Intermediate	Low: stable
	8	Guinea	03-Nov-09	34	Yes	No	Strong	Intermediate	Low: stable
	9	Guinea-Bissau	last WPV in 1997		Yes	No	Strong	Weak	Moderate: stable
	10	Liberia	03-Mar-10	17	Yes	No	Strong	Intermediate	Low: decreasing
	11	Mali	01-May-10	9	Yes	No	Strong	Intermediate	Low: decreasing
	12	Mauritania	28-Apr-10	9	No	No	Intermediate	Weak	High: decreasing
	13	Niger	01-Apr-10	13	Yes	Yes	Strong	Strong	Low: decreasing
	14	Senegal	30-Apr-10	9	Yes	Yes	Strong	Intermediate	Low: decreasing
	15	Sierra Leone	28-Feb-10	18	No	Yes	Intermediate	Strong	Moderate: decreasing
	16	Togo	28-Mar-09	66	No	No	Intermediate	Intermediate	Moderate: stable

Epidemiologic Situation:

There are 16 countries in west and central Africa considered in an "importation belt" due to past and current outbreaks following importation, as listed in the above table. Of the 12 countries in this belt with outbreaks in 2009 due to imported WPV:

- In seven (Benin, Burkina Faso, Cameroon, Central African Republic, Cote d'Ivoire, Guinea, Togo) there have been no confirmed cases in the first 6 months of 2010.
- In three, WPV cases continued to be detected in 2010 (Mali – onset of most recent case 1 May, Mauritania – onset of most recent case 28 April, and Sierra Leone – onset of most recent case 28 February). Cases in Mali and Mauritania are clustered near the shared border.

- In two (Liberia and Niger), there have been no 2009-related WPV isolated in 2010 although both have reported unrelated confirmed WPV cases during Jan–Jun 2010 that represent new importation events in 2010. The closest related virus to WPV1 isolated from the 2010 Liberia case-patient was from a WPV1 case in Guinea in 2009. Laboratory confirmation of the outbreak in Liberia was 14 April, and in Niger, 22 April.

Of the four "importation belt" countries without an outbreak in 2009:

- In one, Senegal, there was an outbreak of 18 WPV cases in 2010 associated with three separate importation events; the onset of the most recent case was 30 April. Laboratory confirmation of the outbreak was 18 January.
- Three countries were unaffected during 2009–2010 (the Gambia, Ghana, Guinea-Bissau); the most recent case was in Ghana with onset 8 November 2008.

Immunization Performance:

The Major Process Indicator target is <10% missed children in 2 SIAs in all 'WPV importation belt' countries (GPEI #1). Supplemental data (NPAFP 0-dose and Pol3) are examined to support monitoring data. Among the 10 "importation belt" countries in west and central Africa without evidence of transmission in 2010:

- In six (Benin, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau) <10% of target children were missed among the national average of monitored areas. Supplemental data support strong SIA and routine immunization performance in Gambia, Ghana, Guinea-Bissau, the "importation belt" countries that were unaffected during 2009–2010 and supplemental data support strong immunization performance in Benin, Cote d'Ivoire and Guinea.
- In four (Burkina Faso, Cameroon, Central African Republic, Togo) ≥10% of target children were missed among the national average of monitored areas. Immunization performance is intermediate in Burkina Faso, Central African Republic and Togo because SIA monitoring results were intermediate (<15%) and supplemental data support this assessment.[13] Immunization performance is weak in Cameroon because one of two SIA rounds indicated 16% missed children, supported by intermediate Pol3 data (79%). However, immunization performance improved in the second SIA round to 12%.

Among six importation belt countries in west and central Africa with 2010 cases:

- In four (Liberia, Mali, Niger, Senegal), <10% of target children were missed among the national average of monitored areas in the most recent rounds. Supplemental data (NPAFP 0-dose and Pol3) support strong immunization performance in all four countries.
- In two (Mauritania, Sierra Leone), ≥10% of target children were missed among the national average of monitored areas. In Mauritania, however, the decrease over time in the proportion of children missed in SIAs during February–May (from >30% to 13%) and results following the June SIA (<10% of target children were missed) indicate that implementation of SIAs has improved. Supplemental data (NPAFP and Pol3) suggest intermediate immunization performance for Mauritania (63% Pol3, 9.7% 0-dose) and Sierra Leone (74% Pol3, 1% 0-dose).

[13] missing dose information for children 6–35 months of age with NPAFP limits interpretation of these data from Central African Republic (19% of children with missing data) and Togo (16% of children with missing data).

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is a NPAFP rate >2 in all sub-national levels (GPEI#2). Four of 16 countries in the west and central Africa "importation belt" have achieved this target over the previous 12 months (Central African Republic, Niger, Sierra Leone, Senegal). In states/provinces with low population, the NPAFP rate was considered to be within acceptable limits if the upper 90% confidence interval around the point estimate was >2. With this analysis, three (Burkina Faso, Cote d'Ivoire, Guinea-Bissau) also have strong AFP detection, seven have intermediate surveillance performance (Benin, Cameroon, Ghana, Guinea, Liberia, Mali, Togo), and one has weak surveillance performance (Mauritania). The national proportion of adequate specimens is weak in Guinea-Bissau (62%), lowering overall surveillance performance, and intermediate (>65% but <80%) in three countries (Burkina Faso, Cote d'Ivoire, Senegal). Overall, both indicators demonstrate limitations in AFP surveillance performance in all but three countries in the west and central Africa "importation belt" (Central African Republic, Niger, Sierra Leone). Of the six countries with confirmed cases in 2010, surveillance performance over the previous 12 months is strong in two (Niger, Sierra Leone), intermediate in three (Liberia, Mali, Senegal) and weak in one (Mauritania with 71% of states/provinces having a NPAFP rate of >2). The Gambia could not be assessed sub-nationally because state/province population data are not available; the national NPAFP rate was >2 in 2009 and to date in 2010, and the national proportion of adequate specimens collected was 100% in each year, so surveillance was considered strong.

Risk Assessment:

Ten of 12 countries in west and central Africa with outbreaks in 2009 following importation appear to have interrupted transmission. There is a high risk of failure to detect and interrupt transmission by mid-2010 in Mauritania (not yet reaching <10% missed children in two SIA rounds and weak surveillance performance) and a low risk in Mali, which has strong immunization performance and intermediate surveillance performance; these risks are decreasing as long as SIAs continue and quality of implementation is improved (or maintained). In Sierra Leone, WPV transmission might have already been interrupted: the onset of the most recent reported case was on 28 February and AFP surveillance performance indicators are strong; however, Sierra Leone remains at moderate risk of substantial transmission following importation because immunization performance is intermediate. Surveillance data will be considered adequate when all AFP cases with onset through 28 August have completed laboratory investigation.

In two of the countries with 2009 outbreaks following importation, Liberia and Niger, there have been new importations in 2010. In Liberia, WPV transmission might have already been interrupted: the onset of the most recent reported case was 3 March; however, AFP surveillance performance indicators are intermediate. Surveillance data will be considered adequate when all AFP cases with onset through 3 September have completed laboratory investigation. Liberia remains at low risk of substantial transmission following importation. It remains to be seen if response efforts to new WPV

Among west and central African countries with 2009 outbreaks, there is a high risk of failure to detect and interrupt WPV transmission by mid-2010 in Mauritania, and a low risk in Mali. With continued SIAs and improved performance, the risks are decreasing.

Of 2010 outbreaks, Niger and Senegal have low, decreasing of risk of failure to interrupt transmission within 6 months of outbreak confirmation. There is a risk of recurrent outbreaks following WPV importation until the last country in the area interrupts transmission.

introductions in Niger and Senegal in 2010 will lead to interruption of transmission within 6 months of outbreak confirmation. Niger and Senegal have low, decreasing risk of failure to detect and interrupt WPV transmission, because of indicators of strong immunization and strong (Niger) or intermediate (Senegal) surveillance performance; the borderline proportion of adequate specimens nationally in Senegal is of concern, however.

Indicators of strong immunization performance and strong or intermediate surveillance performance in Benin, Cote d'Ivoire, Gambia, and Ghana suggest a low risk of substantial transmission following importation of WPV. In Guinea and Guinea-Bissau, although overall immunization performance is strong in both, routine immunization (Pol3) is weak. Because surveillance performance is intermediate in Guinea, the risk of substantial transmission following importation is low. Because surveillance performance is weak in Guinea-Bissau, the risk of substantial transmission following importation is moderate. In Togo, with intermediate immunization and surveillance performance, the risk of substantial transmission following importation of WPV is moderate. In Cameroon, with weak immunization and intermediate surveillance performance, there is concern of a moderate overall risk of recurrent and substantial WPV transmission following importation. Risk for all of this countries (particularly those with low Pol3), although currently stable, will increases as fewer SIAs are implemented.

Caution will be needed in interpreting the latest date of WPV case onset as an indicator of the end of transmission in west and central Africa because of overall suboptimal surveillance performance in the majority of countries. There is a risk of recurrent outbreaks following WPV importation until the last country in the area interrupts transmission.

East Africa importation countries

"Importation belt" and importation countries (east African only)			WPV History		Major Process Indicators		Risk Assessment	
			Date of last WPV	Weeks since last WPV	Immunization: #1: <10% missed children in 2 SIAs (Yes / No) **	Surveillance: # 2: NPAFP rate > 2 achieved at sub-national level (Yes /No)	Immunization performance (strong, intermediate, weak)	Surveillance performance (strong, intermediate, weak)
east Africa	1	Burundi	12-Sep-09	**42**	no data	**No**	Strong	Intermediate
	2	Ethiopia*	cVDPV cases in 2010		**No**	**No**	Weak	Intermediate
	3	Eritrea*	last WPV in 2005		no data	**Yes**	Strong	Strong
	4	Kenya	30-Jul-09	**48**	no data	**No**	Intermediate	Strong
	5	Somalia*	cVDPV cases in 2009		no data	**No**	Intermediate	Strong
	6	Uganda	10-May-09	**60**	no data	**No**	Weak	Intermediate

* Countries that are included in the "WPV importation belt" category

** Country may be without data because an SIA was not held in 2010, or independent monitoring data are unavailable

Epidemiologic Situation:

Six east Africa countries have confirmed WPV cases following importation since 2005. Of the three countries that had outbreaks in 2009 due to imported WPV (Burundi, Kenya, Uganda), no confirmed cases have been reported in the first 6 months of 2010 and transmission appears to have been interrupted (>12 months since the latest case in these countries; the most recent onset was 13 September 2009 in Burundi, 10 May 2009 in Uganda and 30 July 2009 in Kenya). Virologic analysis indicated Democratic Republic of the Congo was the source of WPV (of Indian origin) for Burundi. South Sudan was the source of WPV imported into Kenya and

Uganda. The most recent case reported in Sudan had onset 27 June 2009. Three countries (Eritrea, Ethiopia, Somalia) have not reported confirmed cases in 2009–2010; onset of the most recent confirmed WPV case was 27 April 2008 in Ethiopia. However, circulating vaccine-derived poliovirus (cVDPV) outbreaks have been reported recently in Ethiopia (six cVDPV3 cases during 2009–2010) and Somalia (five cVDPV2 cases during 2008–2010).

Immunization Performance:

Immunization performance in Kenya is intermediate (6.5% 0-dose among children 6–35 months of age with NPAFP cases; the WHO/UNICEF Pol3 estimate is 71%) and weak in Uganda (11% 0-dose and Pol3 of 59%). The limited NPAFP data available for Burundi (0% 0-dose) are consistent with the Pol3 (96%) supporting strong immunization performance.

In Ethiopia, SIA monitoring data indicate weak immunization performance: 17% of children were missed in a single mOPV3 round (average of all monitored provinces) and 75% of monitored provinces had ≥10% missed children (outside the house method). Supplemental data from Ethiopia support weak immunization performance with Pol3 of 76% and national 9.5% 0-dose among children 6–35 months of age with NPAFP; sub-national analysis indicates 40% of provinces with ≥10% 0-dose children. Eritrea has a strong immunization performance with 0% 0-dose children among children 6–35 months of age with NPAFP and 99% Pol3 coverage. Although Somalia has 9% 0-dose nationally among children 6–35 months of age with NPAFP, low Pol3 coverage (28%) indicates a weak routine immunization program and an overall intermediate immunization performance.

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is a NPAFP rate >2 in all sub-national levels (GPEI#2). Among the six countries in east Africa, this target is only met in Eritrea. Kenya and Somalia also have strong surveillance performance, after using the confidence limits to account for areas with low population. Burundi, Ethiopia and Uganda, have intermediate surveillance performance after using the confidence limits to account for areas with low population. There is, a suboptimal proportion of adequate specimens in Burundi (77%).

In east Africa, there are no indications of WPV transmission in 2010.

Risk Assessment:

There is evidence of interruption of transmission in east Africa countries that had outbreaks in 2009 after WPV importations suggesting that the region should be able to sustain polio-free status through 2010. However, the quality of immunization performance is weak in Ethiopia and Uganda and intermediate in Kenya and Somalia, indicating a risk of substantial transmission following WPV importation and a risk of future cVDPV outbreaks, particularly in countries with weak routine immunization performance (Pol3 <75%).

Asia Importation Countries

Importation countries (Asia only)			WPV History		Major Process Indicators		Risk Assessment		
			Date of last WPV	Weeks since last WPV	Immunization: #1: <10% missed children in 2 SIAs (Yes / No)	Surveillance: # 2: NPAFP rate > 2 achieved at sub-national level (Yes /No)	Immunization performance (strong, intermediate, weak)	Surveillance performance (strong, intermediate, weak)	Overall risk of failure to detect and interrupt WPV transmission (risk / trend)
Asia	1	Nepal	09-Jun-10	**3**	**No**	**Yes**	Weak	Strong	**High: decreasing**
	2	Tajikistan *	12-Jun-10	**3**	**Yes**	**No**	Strong	Intermediate	**Moderate: stable****

* Country reported at least 1 case with a July onset as of 16 August 2010

** Three or more states/provinces have had virus in the last 6 months (refer to methods section)

NEPAL

Epidemiological Situation:

During January–June 2010, five WPV 1 cases were detected from two districts in the Nepali Terrai region bordering the Indian state of Bihar, with onset of the most recent case on 9 June. Virologic sequence analysis indicates two separate importations (first laboratory confirmed 19 March 2010) most closely related to WPVs circulating in Bihar, India in late 2009. Laboratory confirmation of the outbreak was 19 March.

Immunization Performance:

In monitoring data from a SIA conducted in June 2010 an average of 30% of children were missed (assessed outside the house). Independent monitoring data were not collected for two other rounds before June. Immunization performance is weak; performance is being assessed based on this monitored round but is not consistent with the previous experience in rapidly limiting transmission following importation. However, WHO/UNICEF Pol3 coverage is intermediate (82%) and the reported immunization status of children 6–35 months of age with NPAFP provides indication of the strength of routine and SIA delivery. (0-dose of 0%). The overall proportion of children 6–35 months of age with 4+ OPV doses (91%) is consistent with Pol3 coverage.

Surveillance Performance:

NPAFP rate targets are met nationally and sub-nationally; 100% of states/provinces have NPAFP>2. National adequate specimen collection is 89%.

In Nepal, the monitored SIA showed weak immunization performance, although supplemental indicators suggest intermediate routine immunization. There is a high, decreasing risk of failure to detect and interrupt WPV transmission within six months of confirmation until additional SIAs are implemented.

Risk Assessment:

There is evidence of limited local transmission of WPV following importation to date, which is consistent with the indicators of high immunity by Pol3 and NPAFP 0-dose data. If SIA implementation can be enhanced, there is a high likelihood that the limited circulation of WPV will be quickly interrupted. Thus, Nepal currently has a high, decreasing risk of failing to detect and interrupt transmission within 6 months of confirmation. Additional SIAs have already been implemented in July and August. Nepal remains vulnerable to WPV importations due to the proximity to India and high volume of population movement between India and Nepal.

TAJIKISTAN

Epidemiological Situation:

As of 16 August 2010, 452 laboratory-confirmed WPV1 cases were reported in Tajikistan, with onset of the first case on 1 February (laboratory confirmation on 20 April), and onset of the most recent case on 4 July. Through June 30, there were 451 confirmed cases.

Immunization Performance:

Of the four SIAs rounds conducted two weeks apart to date in 2010, independent monitoring for rounds 2-4 indicate <5% missed children overall and in all provinces. Data on immunization status of children 6–35 months of age with NPAFP has not been collected in a way to differentiate 0-dose children from children with unknown immunization status. The overall proportion of children 6–35 months of age with NPAFP with 4+ OPV doses (28% among all NPAFP including unknown in the total) is not consistent with the WHO/UNICEF Pol3 coverage estimate (93%), but this may be an artifact of incomplete data collection as well as overestimated Pol3. The extent (five of six states involved) and size of the outbreak indicates that the WHO/UNICEF Pol3 estimate, based on recent administrative data, did not accurately represent the immunization status of the population. Based on SIA monitoring data and uncertain supplemental data, immunization performance after the outbreak is strong.

Surveillance Performance:

Surveillance performance is intermediate based on AFP surveillance performance indicators that meet targets for countries without recent WPV circulation (NPAFP rate was >1/100,000 children <15 years of age nationally and in all provinces). Surveillance performance is intermediate because 80% of provinces meet the NPAFP incidence target for countries with current poliovirus circulation. National proportion for adequate specimen collection was 87%. However, there was a period of time during the outbreak (24 May–7 June) in which adequate specimens were collected for only 19 of 44 AFP cases.

Risk Assessment:

A rapid response with high SIA coverage in four rounds (administered during <9 weeks) was implemented after laboratory confirmation of the first case resulting in a marked decrease in confirmed and suspected cases. However, the occurrence of a confirmed case three weeks after the fourth SIA raises concern about ongoing transmission. Given the strong immunization performance and intermediate surveillance performance but because of the extent of WPV transmission, the risk of failure to detect and interrupt WPV is moderate. It remains to be seen whether the response efforts will lead to interruption of transmission within 6 months of confirmation of the outbreak, but with additional SIAs planned, Tajikistan has a moderate, stable risk of failing to detect and interrupt transmission within six months of confirmation.

In Tajikistan there is a moderate, stable risk of failure to detect and interrupt WPV transmission within six months of confirmation until additional SIAs are implemented.

NOTE: RUSSIAN FEDERATION

As of August 16, eight WPV1 cases virologically related to the outbreak in Tajikistan had been confirmed and investigated in 2010 (latest onset in June) and reported in a preliminary manner to WHO and partners. Subsequently, 11 cases were included in the weekly global update of 7 September (http://www.polioeradication.org).

Re-Established Wild Poliovirus Transmission

Re-established countries		WPV History		Major Process Indicators			Risk Assessment		
		Date of last WPV	Weeks since last WPV	Immunization	Surveillance		Immunization performance (strong, intermediate, weak)	Surveillance performance (strong, intermediate, weak)	Overall risk of failure to detect and interrupt WPV transmission (risk / trend)
				Country-specific**	# 2: NPAFP rate > 2 achieved at sub-national level (Yes /No)	Country-specific**			
1	Angola *	16-Jun-10	**2**	**#3 - No**	**No**	n/a	Weak	Intermediate	**High: *increasing***
2	Chad	22-May-10	**6**	**#4 - Process indicator refers to second half of 2010**	**Yes**	n/a	Weak	Intermediate	**High: *decreasing***
3	Democratic Republic of Congo *	25-Jun-10	**1**	**#7 - No SIA were held in specified regions**	**Yes**	**#5 - Yes #6 - Yes**	Weak	Intermediate	**High: *increasing***
4	Sudan	27-Jun-09	**53**	**#10 - No**	**No**	**#8 - No #9 - No**	Weak	Weak	**High: *decreasing***

* Country reported at least 1 case with a July onset as of 16 August 2010

** GPEI country specific process indicators:

3 Angola: <10% missed children in all districts of Luanda, Benguela and Kwanza Sul during each SIA

4 Chad: <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the 2nd half of 2010

5 DRC: >80% adequate specimens in all provinces

6 DRC: AFP rate >2 in all provinces

7 DRC: <10% missed children in each SIA in Orientale, North & South Kivu (and all provincial capitals)

8 southern Sudan: >80% adequate specimens rates in all states

9 southern Sudan: AFP rate >2 in all states.

10 southern Sudan: <10% of missed children in each state during each SIA

ANGOLA

Epidemiologic Situation:

WPV1 of the same related lineage has been circulating in Angola since 2007 following importation from India. Of the 18 WPV1 confirmed cases with onset during January–June 2010 (compared to 15 during January–June 2009), two have been in Luanda (the capital), which was identified as high-risk for the 2010–2012 strategic plan, and none have been in Benguela and Kwanza Sul provinces which were also identified as high-risk. However, there have been 11 cases in Lunda Norte, two cases in Lunda Sul at the eastern border, and four cases in other provinces in central Angola which were not identified as high-risk. As of 16 August, 19 confirmed WPV cases were reported.

Immunization Performance:

The Major Process Indicator target is <10% missed children in all districts of Luanda, Benguela and Kwanza Sul during each SIA in 2010 (GPEI #3). Of the 20 districts with data, only four meet that criterion (five districts had >30% missed children). Based on independent monitoring data, an average of 7-15% of

children were missed in SIAs overall. Sub-national analysis shows substantial, variable weakness in SIA implementation where monitored, particularly among districts in the provinces of Luanda, Benguela and Kwanza Sul. In independent monitoring data for June SIAs, >50% of provinces had ≥10% missed children. Immunization status data for children with NPAFP 6–35 months of age nationally are consistent with SIA monitoring data and indicate weak routine immunization coverage. The overall proportion of children with NPAFP 6–35 months of age with 4+ doses of OPV (32%) is substantially less than the WHO/UNICEF estimate of Pol3 coverage (73%) and the proportion 0-dose nationally is 10%. Monitoring data to date may not fully reflect immunization performance weaknesses.

Transmission of WPV1 detected in central and northeastern provinces in 2010 as well as persistent circulation in western Angola indicates continuing extensive susceptibly because of serious weaknesses in routine and SIA immunization coverage, and a need to focus more on monitoring data from districts not indicated in the strategic plan.

Surveillance Performance:

The Major Progress Indicator target for all endemic, re-established transmission and "importation belt" countries is a NPAFP rate >2 in all sub-national levels (GPEI#2). The national NPAFP rate of 3.2 and the adequate specimen collection percentage (92%) meet targets. NPAFP sub-nationally is >2 in most areas (89%) of the country, and 100% of states/provinces are within acceptable limits for areas with low population. However, surveillance performance is intermediate because genomic sequence analysis of WPV1 isolates since 2007 (including in 2010) has frequently shown isolates without recent close relatives, an indication of missing chains of transmission. This signifies ongoing weakness in AFP detection, investigation, specimen collection and/or transport in major areas of the country that is not demonstrated by the standard indicators.

Risk Assessment:

Available surveillance and vaccine coverage data do not support progress in the first months of 2010.

Angola has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2010 because of

- Persistent WPV transmission and involvement of newly-affected provinces in 2010.
- Low indicators of immunization of targeted children in routine and supplementary immunization.
- Ongoing weaknesses in surveillance performance that have prevented effective tracking of WPV transmission.

Angola has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2010 and of exporting WPV into neighboring countries

Angola also poses a high, increasing risk of exportation of WPV into neighboring countries as evidenced by repeated episodes of importation into the Democratic Republic of the Congo in past years, and again in 2010. Monitoring of SIA implementation in all affected districts may be necessary, not only those indicated in the Strategic Plan, and supplemental SIA monitoring surveys may be helpful.

CHAD

Epidemiologic Situation:

14 WPV3 cases were identified during January–June 2010 in multiple provinces of the country, compared with 10 cases during January–June 2009. The onset of the most recent case was 22 May 2010. WPV3 transmission has been ongoing since importation from Nigeria in 2007. June represents the first month since March 2009 in which no WPV cases have been detected.

Immunization Performance:

The Major Process Indicator target is <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010 (GPEI #4). Overall immunization performance is weak based on independent monitoring of SIAs from January–June 2010; no SIA in those areas has yet reached the target with an average of 14% missed children. Independent monitoring data for the two most recent SIAs indicate ≥10% missed children overall and in >60% of monitored provinces. However, evaluation of data from November 2009 (data not shown) and over the first 6 months of 2010 suggest improving SIA coverage (from 26% outside the house method evaluation in February to 11% in June).

NPAFP immunization status data are consistent with SIA monitoring data. The reported immunization status of children with NPAFP 6–35 months of age indicates suboptimal coverage nationally (13% 0-dose children). The overall proportion of children 6–35 months of age with 4+ doses of OPV (42%) is consistent with the WHO/UNICEF estimate of Pol3 coverage (36%).

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is NPAFP rate >2 in all sub-national levels (GPEI#2). Overall AFP surveillance performance indicators appear to meet targets nationally with 100% of states with NPAFP >2 and proportion of adequate specimens at 84%. However, >10% of AFP cases are missing age and/or dose history, there are often delays in shipping specimens for testing, and >10% of specimens arrive at the laboratory in poor condition. Because of limitations, there is a high number (27) of compatible cases reported in 2010 thus far that make interpretation of the epidemiologic data more difficult. Surveillance performance is intermediate because there is some virologic evidence indicating ongoing missing chains of transmission signifying ongoing weakness in AFP detection, investigation, specimen collection and/or transport in major areas of the country.

Risk Assessment:

Chad has a high, risk of failure to detect and interrupt WPV transmission by the end of 2010 because of

- long-standing persistence of transmission,
- weaknesses in AFP surveillance performance, and
- weak routine and SIA implementation performance.

Chad has a high, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2010 and of exporting WPV into neighboring countries

However, monitoring data following SIAs in the first months of 2010 suggest some progress and decreasing risk, accompanying increased political support. Chad also has a high, decreasing risk of exportation of WPV

into neighboring countries as evidenced by repeated episodes of importation into Niger in 2009–2010 and into Sudan in past years.

DEMOCRATIC REPUBLIC OF THE CONGO

Epidemiologic Situation:

During January–June 2009, three WPV3 cases were identified which represented transmission within DRC after importation in 2009. Five WPV1 cases were identified during January–June 2010 in provinces of the country adjacent to Angola, as a result of two separate importation events with WPV of Angolan origin. As of 16 August, there have been six cases reported, five in Kasai province on the Angola border; the most recent had onset on 11 July. One confirmed case with onset 10 June was detected in Katanga province on the border with Tanzania/Lake Tanganyika.

Immunization Performance:

The Major Process Indicator target is <10% missed children in each SIA in Orientale, North & South Kivu (and all provincial capitals)(GPEI #7). SIAs have not been implemented to date in those areas. Independent monitoring data for the two most recent SIAs in Bandundu and Kasai-Occidental indicate ≥10% (12-38%) missed children.

NPAFP immunization data are consistent with the SIA monitoring data. The reported immunization status of children with NPAFP 6–35 months of age indicates weakness in coverage nationally (12% 0-dose children). The overall proportion of children 6–35 months of age with NPAFP with 4+ doses of OPV (33%) is inconsistent with the WHO/UNICEF estimate of Pol3 coverage (74%) and suggests the Pol3 coverage estimate (made without recent surveys) may overestimate true coverage.

Surveillance Performance:

The Major Process Indicator targets are >80% adequate specimens in all provinces (GPEI #5) and a NPAFP rate >2 in all provinces (GPEI#6). Overall AFP surveillance performance indicators meet NPAFP rate and specimen collection targets nationally and sub-nationally (100%); however, virologic sequence analysis indicates surveillance performance is weak with significant evidence of missed chains of transmission in Katanga.

There are historical concerns about the quality of surveillance in the northeast/east area of the country, because the isolates from the 2009 Burundi WPV1 cases were genetically closely related to WPV1 last isolated in 2008 in northeast areas of DRC. On this basis, the country was classified in 2009 by the Advisory Committee on Polio Eradication as having suspected re-established transmission. That classification is substantiated by the finding that WPV isolated from the most recently identified case in Katanga province is most closely related to WPV isolated in DRC in 2007–2008. This undetected transmission demonstrates intermediate surveillance performance with deficiencies in AFP detection, investigation, specimen collection and/or transport in eastern areas of the country despite surveillance performance indicators meeting targets.

Risk Assessment:

All recent WPV cases at the southwest border of DRC are imported or closely related to imported WPV from Angola. There has not been sufficient time to indicate whether the response efforts to date will lead to interruption of transmission within 6 months of onset of the first case.

Most importantly, undetected circulation in eastern provinces for over two years of WPV originally imported from Angola in 2007 presents clear virologic evidence of weaknesses in immunization and surveillance. This serious limitation in surveillance plus substantial weaknesses in routine immunization and SIA coverage, throughout the country but primarily in the east, indicate that the Democratic Republic of the Congo has a high, increasing risk to detecting and interrupting WPV transmission by the end of 2010. Of future note, caution will be needed in interpreting the last date of WPV case onset as an indicator of the end of transmission because of the undetected limitations in surveillance quality.

Democratic Republic of the Congo has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2010; evident weaknesses in surveillance in eastern portions of the country in spite of strong sub-national surveillance performance indicators, and weaknesses in immunization performance, are of major concern.

SUDAN

Since the WPV transmission zone in 2009-2010 was south Sudan, this assessment of risk is limited to that area of Sudan.

Epidemiologic Situation:

WPV1 of Nigerian origin was imported into Sudan via Chad in 2004 and resulted in 147 polio cases during 2004–2005. With apparent interruption of WPV1 transmission in Sudan in 2005, western Sudan experienced two WPV3 importation events in 2008.

WPV1 was isolated from a child with AFP who resided in Ethiopia near the south Sudan/Ethiopia border in a cross-border subpopulation with onset in April 2008. Subsequently, cases were detected further west in south Sudan starting in June 2008; the most recent case had onset 27 June 2009 for a total of 71 cases in south Sudan during 2009-2010. Although the apparent duration of the outbreak was ~12 months, genomic sequence analysis indicated that the most closely related WPV1 isolate prior to 2008 was obtained from a case-patient in Sudan in 2005. It was on this basis that the country/area was classified in 2009 by the Advisory Committee on Polio Eradication as having suspected re-established transmission.

Immunization Performance:

The Major Process Indicator target is <10% of missed children in each state during each SIA (GPEI #10). Immunization performance for south Sudan is weak based on SIA monitoring indicators for two rounds for the 10 provinces in south Sudan which indicate suboptimal coverage (≥10% missed children, up to 21%) in 60% of the provinces. However, SIA monitoring data for identifying missed children outside the house were not

available for analysis. Among the 10 states of south Sudan, the proportion of children 6–35 months of age with NPAFP with 0-dose is 7.3% (refer to Annex 5).

Note: The reported immunization status of children with NPAFP 6–35 months of age nationally masks the specific data for the states of south Sudan. The overall proportion of children 6–35 months of age with 4+ doses of OPV is high nationally (79%) and is generally comparable with the WHO/UNICEF estimate of Pol3 coverage for the entirety of Sudan (84%). The proportion of children 6–35 months of age with NPAFP with 0-dose is 4% nationally.

Surveillance Performance:

The Major Process Indicator targets are >80% adequate specimens in all provinces in south Sudan (GPEI #8) and a NPAFP rate >2 in all provinces (GPEI#9). Surveillance performance is weak in south Sudan because the Major Process Indicators specifically for south Sudan of AFP sub-national surveillance performance do not meet targets as reported. Only six of the 10 states of south Sudan meet both targets for NPAFP rate and proportion of AFP with adequate specimens. The NPAFP target is met by seven states and the specimen collection target by nine states. Recent data have shown some marked improvement; there has been a near doubling of AFP cases investigated in south Sudan during January–June 2010 compared to the similar period in 2009.

South Sudan has shown substantial progress but has a high, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2010, because of weak immunization performance and weak surveillance performance by Major Process Indicators.

Risk Assessment:

Although outside the house independent monitoring data are not available for optimal assessment of SIA implementation, available SIA independent monitoring data and 0-dose NPAFP data suggest that immunization coverage is improving. South Sudan has a high risk of failure to detect and interrupt WPV transmission by the end of 2010, because of

- weak immunization performance, and
- currently weak surveillance performance.

Because of limitations in surveillance quality in the past and currently, caution will be needed in interpreting the last date of WPV case onset as an indicator of the end of transmission given current limitations in AFP surveillance. However, major improvements in AFP surveillance indicate the risk of failure to detect and interrupt WPV transmission is decreasing.

Endemic Wild Poliovirus

Endemic countries		WPV History		Major Process Indicators		Risk Assessment		
		Date of last WPV	weeks since last WPV	Immunization	Surveillance	Immunization performance (strong, intermediate, weak)	Surveillance performance (strong, intermediate, weak)	Overall risk of failure to detect and interrupt WPV transmission (risk / trend)
				Country-specific**	# 2: NPAFP rate > 2 achieved at sub-national level (Yes /No)			
1	Afghanistan*	23-May-10	**6**	**#11 - No**	**Yes**	Weak	Intermediate	**High: *stable***
2	India*	14-Jun-10	**2**	**#12 - Analysis expected 4th quarter**	**No**	Strong	Strong	**Moderate: *decreasing* *** **
3	Nigeria	01-Apr-10	**13**	**#13 - No**	**Yes**	Weak	Intermediate	**High: *decreasing***
4	Pakistan*	24-Jun-10	**1**	**#14 - No #15 - No**	**No**	Weak	Intermediate	**High: *increasing***

* Country reported at least 1 case with a July onset as of 16 August 2010

** GPEI country specific process indicators:

# 11	Afghanistan: <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the Southern Region
# 12	India: >95% population immunity to type 1 polio sustained in the persistent transmission areas of western Uttar Pradesh, and achieved in the persistent transmission areas of central Bihar.
# 13	Nigeria: <10% 0-dose children (per NP AFP data) in each of the 12 high-risk states (including the 8 persistent transmission states)
# 14	Pakistan: <15% missed children during at least 8 SIAs in every district of the Quetta area and the persistent transmission districts and agencies of NWFP and FATA
# 15	Pakistan: <10% missed children during at least 4 SIAs in every town of Karachi

*** Three or more states have had virus in the last 6 months (refer to methods section)

AFGHANISTAN

Epidemiologic Situation:

In Afghanistan, poliovirus transmission during January–June 2010 predominantly occurred in the 13 high-risk districts in the conflict-affected South Region; 12 WPV cases (4 WPV1 and 8 WPV3) have been confirmed in 2010, compared with 13 (12 WPV1 and 1 WPV3) during the same time period in 2009. The number of districts affected by WPV have remained largely unchanged from the same period in 2009 (11) to 2010 (10). Two cVDPV2 cases have been identified in Afghanistan during 2009–2010.

Immunization Performance:

The Major Process Indicator target is <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the Southern Region. SIA monitoring data available for the 13

high-risk districts indicate that in all 13, the target of <10% missed children has consistently not been reached in 2010 SIAs.

The reported immunization status of children with NPAFP 6–35 months of age indicates high coverage viewed nationally (1% 0-dose children) and sub-nationally (all provinces having <10% 0-dose children). The overall proportion of children 6–35 months of age with 4+ doses of OPV (94%) is consistent with the WHO/UNICEF estimate of Pol3 coverage (83%). However, these data mask substantial differences in high-risk districts of the south region. Because of the emphasis on SIA monitoring data in high-risk districts in assessing program progress, immunization performance is weak.

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is NPAFP rate >2 in all sub-national levels (GPEI#2). Overall AFP surveillance performance indicators generally meet targets nationally and sub-nationally, despite access problems in the conflict-affected districts. Adequate specimen collection from children with AFP is <80% in one province. Surveillance performance is strong by these indicators; recently, however, virologic analysis has indicated a genetic linkage which is distant, indicating missed chains of transmission and intermediate surveillance performance in some areas.

Risk Assessment:

While the number of WPV1 cases has decreased during 2010 compared to the same time period in 2009, WPV3 cases have increased and therefore the total number of WPV cases reported in Afghanistan has not substantially changed

Afghanistan has a high, stable risk of failure to detect and interrupt WPV transmission by the end of 2011 because both WPV1 and WPV3 continue to circulate in insecure districts in the south region. Additionally, two cVDPV2 cases have been identified in Afghanistan during 2009–2010 suggesting ongoing limitations in routine immunization and a need to balance mOPV/bOPV use in SIAs with at least two tOPV SIAs per year.

Afghanistan has a high, stable risk of failure to detect and interrupt WPV transmission by the end of 2011 because of ongoing problems in accessing children in insecure southern areas.

INDIA

Epidemiologic Situation:

During January–June 2010, 25 WPV cases (7 WPV1, 18 WPV3) have been confirmed in 2010, compared with 151 (28 WPV1, 122 WPV3, 1 mixed WPV1/WPV3) during January–June 2009. As of August 16, three additional cases have been reported (WPV1 cases from Maharashtra and Jharkhand); the most recent case (WPV1 from Jharkhand) had onset of paralysis on 22 July.

The number of districts affected by WPV has also decreased substantially—WPV1: 4 vs. 13 (plus one WPV1/WPV3) in 2010 compared to 2009; WPV3: 10 vs. 21 in 2010 compared to 2009.

The last identified WPV1 in Uttar Pradesh was isolated from cases with onset in November 2009. WPV 1 virus that was related to WPV last isolated during 2009 in western Uttar Pradesh was imported into Tajikistan in late 2009 or early 2010 resulting in large polio outbreak.

The last confirmed WPV1 case in Bihar had onset in October 2009. However, WPV 1 virus related to Bihar strains have been isolated from AFP cases with onset during January–June 2010 in West Bengal, Jharkhand, Maharashtra and Nepal; a Bihar strain imported into Punjab in 2009 was isolated in 2010 from a case among migrants in Jammu and Kashmir. Testing of environmental samples taken within Delhi (started in May 2010) has detected both WPV 1 and WPV 3 on various occasions that are also related to Bihar WPV strains. There were no positive samples during the same period from environmental sampling in Mumbai. A total of 16 cases of cVDPV2 were isolated during 2009–2010; onset of the most recent was 18 January 2010.

Immunization Performance:

The Major Process Indicator target for end-2010 is >95% population immunity to type 1 polio sustained in the persistent transmission areas of western Uttar Pradesh, and achieved in the persistent transmission areas of central Bihar. Epidemiologic modeling has been done to estimate this; however, the best estimate of target population immunity will be by serosurveys underway in 2010.

Although independent monitoring data were not systematically reviewed for the country as in other country assessments, summaries have been provided by the country WHO office. SIA monitoring data have consistently shown very high coverage rates (>95%) in the two endemic states of Uttar Pradesh and Bihar, including remote areas of central Bihar. Estimates of SIA coverage in migrant populations outside Uttar Pradesh and Bihar suggest <10% missed children in most places for most SIAs, but with the operational goal being <5%, current data suggest further need for improvement among these groups. Occasional SIAs monitoring in high-risk migrant populations in Mumbai and Delhi have found >10% missed children and the types of migrant children at highest risk varies by site. All sites indicated <8% missed children in migrant populations in the July SIA. Under standard criteria for this assessment, immunization performance is strong in Uttar Pradesh, Bihar and for the country program overall.

The reported immunization status of children with NPAFP 6–35 months of age indicates 0.3% 0-dose children and >97% reporting 4+OPV doses — nationally and in the high-risk states of Bihar and Uttar Pradesh. However, this includes SIAs in which tOPV, mOPV 1 or 3 and bOPV has been used.

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is NPAFP rate >2 in all sub-national levels (GPEI#2). The annualized NPAFP rate in India is

>10/100,000 nationwide (>30 in Bihar; >15 in Uttar Pradesh). Only one state with population >100,000 has not met the target NPAFP rate (one when looking at upper 90% confidence limits) and this island state is outside the high-risk northern zone and not considered relevant for this assessment. Adequate specimen collection is 83% nationwide and is ≥80% in 77% of states, including Bihar and Uttar Pradesh (85% of states with more than 15 AFP reported). There has been a cataloguing of sites where migratory populations temporarily reside in high concentrations, with a specific effort to monitor AFP surveillance indicators for those sites. Surveillance performance is high.

NOTE: Multiple isolates of WPV that on genomic sequence analysis are most closely related to WPV circulating in Bihar have occurred elsewhere in India and in Nepal in the absence of cases detected in Bihar. This suggests ongoing circulation in subpopulations outside Bihar and possibly within Bihar. This underlines the need to review and further reinforce AFP/poliovirus surveillance and assess whether mobile and other high-risk populations are under appropriate surveillance. It is possible that WPV could be circulating in Bihar associated with introduction into other locations while being missed for 8 months with AFP surveillance indicators exceeding performance standards. Therefore it is necessary to determine 1) whether AFP surveillance in Bihar performs as well as the indicators suggest for the entire path of AFP detection, investigation, specimen collection and/or transport and testing, including among mobile and hard-to-reach populations (current data do not indicate substantial deficiencies); 2) whether WPV circulation in migrant populations has in fact been established and otherwise missed by surveillance. In addition, consideration needs to be given to the potential that transient re-infections in older children and young adults may play a role in sustaining low level WPV transmission inside and/or outside of Bihar.

Risk Assessment:

The reduction in the number of WPV1 and WPV3 cases in India from 2009 indicates significant progress towards polio eradication. Nonetheless, India is at moderate, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2011.

Data suggest continuing improvements in reaching mobile and remote populations in SIAs, but the assessment of current serologic immunity of children following predominantly bOPV use in SIAs awaits the completion of seroprevalence studies which began in August 2010. The reduction in the number of WPV1 and WPV3 cases and affected districts in India from 2009 indicates significant progress towards polio eradication. This progress is, however, still vulnerable and depends on rapid interruption of WPV transmission in West Bengal and Jharkhand and on simultaneously maintaining high population immunity in Bihar and Uttar Pradesh. Progress in the India program is one of the most promising in 2010, and data indicate substantial progress toward meeting milestone three by the end of 2011 if current patterns can be maintained until the low season. Circulation in more than three states is indicative of remaining population susceptibility. There is room for improvement in coverage in specific subpopulations such as migrants. Therefore, India remains at moderate, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2011 because of the multiple foci of circulation of WPV in the current season and the virologic evidence suggesting the possibility of ongoing low-level WPV1 transmission in Bihar. There remains an ongoing threat of reseeding high-risk areas of western Uttar Pradesh, importation of WPV into other areas of India and its neighbors, and long-distance importation into other vulnerable areas. If direct evidence of persistence of transmission in Bihar surfaces, contingency measures to supplement the current approaches may need to be considered.

NIGERIA

Epidemiologic Situation:

From January–June 2010, Nigeria has identified 6 WPV (3 WPV1 and 3 WPV3) cases in 6 districts in 4 states. WPV1 cases declined from 67 during January–June 2009; WPV3 cases declined from 290. The onset of the most recent WPV3 case was 15 June (Zamfara state) and of the most recent WPV1 case was 18 June (Borno state). There have been 9 cVDPV2 cases during January–June 2010, decreased from 137 during January–June 2009, in 6 northern states (others have since been identified).

Immunization Performance:

During January–June 2010, two national SIAs (one with bOPV, one tOPV) and three sub-national SIAs (one each bOPV, mOPV1, and mOPV3) were conducted. SIA monitoring data were not systematically reviewed; of those data available for the April SIA, ≥10% of the children were missed in 18% of the monitored wards in Kano, 15% of the monitored wards in Borno, and 12% of the monitored wards in Kebbi.

The Major Process Indicator target is <10% 0-dose children (per NPAFP data) in each of the 12 high-risk states. That goal has been met for ten (83%) of these states; the two that failed are Kano (20% 0-dose and 33% 4+ doses) and Yobe (12% 0-dose and 40% 4+ doses). The proportion of missed children may be underestimated by this indicator.

In this large country, pooled national data mask the current situation in the high-risk areas. The reported immunization status nationally of children with NPAFP 6–35 months of age revealed 3.6% 0-dose children and 65% of children 6–35 months of age with NPAFP who had a recall history of 4+ doses of OPV during July 2009–June 2010. Based on the Major Process Indicator and SIA monitoring, immunization performance is weak.

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is NPAFP rate >2 in all sub-national levels (GPEI#2). AFP surveillance performance indicators appear to generally meet targets nationally and sub-nationally, with all states having NPAFP rates > 2 and >80% adequate specimen collection.

Despite strong performance indicators in the current period and recent past, there are virologic indications of surveillance limitations. Three of the seven WPV1 isolates from July–December 2009 cases and all three WPV1 isolates from January–June 2010 exhibited >1.5% divergence from the closest predecessor. Similarly, nine of the 24 (38%) WPV3 isolates from July–December 2009 and all three 2010 WPV3 isolates exhibited ≥1.5% divergence. For VDPVs, there were 3 out of 14 in 2010 exhibited >1.5% divergence from the closest predecessor during July–December 2009 but seven of nine from January–June 2010. A higher percentage of isolates may have distant genetic relationships as fewer WPV cases occur; however, genomic sequence analysis indicates some missed chains of WPV transmission during 2009–2010 were not detected for more than a year. This finding indicates intermediate surveillance performance despite AFP surveillance performance indicators meeting or exceeding targets at national and all state levels. Surveillance gaps might be occurring among specific subpopulations such as migrants in northern Nigeria who have limited access to immunization activities and health-care providers, as well as among specific districts with surveillance weaknesses in AFP detection, investigation, specimen collection and/or transport in some areas of the country.

Risk Assessment:

Substantial reductions in the number and extent of identified WPV1, WPV3, and cVDPV2 cases and affected districts during January–June 2010 compared with the same period in 2009 in Nigeria suggests marked improvements in coverage during SIAs since early- to mid-2009.

Within high-risk northern states, a high proportion of children remain at risk as a result of focal areas with low routine immunization and SIA coverage and high birth rates. Because there are uncertainties in the quality of AFP surveillance by the virologic evidence and because there are decreased but still sizable subpopulations of missed children, Nigeria has a high, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2011. Furthermore, potential disruptions in services during the state and federal elections planned for early 2011 could limit program progress.

If progress in Nigeria can be sustained, WPV transmission in Nigeria could be interrupted in the near future. However, with a high proportion of 0-dose children in some areas, Nigeria has a high, decreasing risk of failure to detect and interrupt WPV transmission by the end of 2011.

PAKISTAN

Epidemiologic Situation:

In Pakistan during January–June 2010, 31 WPV cases (15 WPV1 and 16 WPV3) have been confirmed in 2010, compared with 22 (14 WPV1 and 8 WPV3) during January–June 2009. The number of districts affected by WPV have remained largely unchanged from 2009 (17) to 2010 (19) and are located in the northern transmission zone (most of Khyber Pakhtunkhwa [formerly North West Frontier Province] and the federally administered tribal areas [FATA], bordering eastern Afghanistan), and the southern transmission zone (bordering south Afghanistan, extending into Pakistan through Balochistan into the towns around Karachi, Sindh).

Immunization Performance:

The Major Process Indicator targets are <15% missed children during at least 8 SIAs in every district of the Quetta area and the persistent transmission districts and agencies of Khyber Pakhtunkhwa and FATA and <10% missed children during at least 4 SIAs in every town of Karachi. Of the five SIA rounds in 2010, house-to-house SIA independent monitoring indicated <10% missed children in most districts in most rounds. The target of <15% missed children has been reached in all SIA rounds in Peshawar district in Khyber Pakhtunkhwa, the monitored districts of FATA, and one of three monitored districts in Balochistan. Among the 18 monitored towns of Karachi, house-to-house SIA independent monitoring indicated <10% in five for all five SIA rounds to date; no other town had results from at least 4 rounds meeting the criterion.

The reported immunization status of children with NPAFP 6–35 months of age suggests high coverage viewed nationally (2% 0-dose children) and sub-nationally (all provinces having <10% 0-dose children). The overall proportion of children 6–35 months of age with 4+ doses of OPV (94%) is generally consistent with the WHO/UNICEF estimate of Pol3 coverage of 85% except in Khyber Pakhtunkhwa, where <80% of children

6–35 months of age with NPAFP have 4+ doses of OPV. However, these data mask the substantial differences that still are apparent in the high-risk districts in both transmission zones. Because of the emphasis on SIA monitoring data, immunization performance is weak.

Surveillance Performance:

The Major Process Indicator target for all endemic, re-established transmission and "importation belt" countries is NPAFP rate >2 in all sub-national levels (GPEI#2). Overall AFP surveillance performance indicators generally meet targets nationally and sub-nationally, despite access problems in the conflict-affected Khyber Pakhtunkhwa Province. However, only 86% of provinces meet the target NPAFP rate. Among supplemental data, the initiation of sewage sampling (environmental surveillance) and genomic sequence analysis of WPV isolates from AFP and environmental surveillance have indicated apparent weaknesses in AFP detection, investigation, specimen collection and/or transport in some areas of the country. Surveillance performance is intermediate.

Risk Assessment:

Circulation of both WPV serotypes persists in high-risk districts in both transmission zones. WPV1 cases have remained relatively unchanged during 2010 compared to the same time period in 2009 however, WPV3 cases have increased. Although Pakistan did not meet SIA monitoring targets in all locations, there were many areas where the targets had been met. With the humanitarian disaster that has occurred with the recent massive flooding, all immunization and surveillance services will be seriously disrupted throughout Pakistan, but particularly in the specific areas of most severe flooding, where WPV has been circulating. Pakistan has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2011.

Because of long-standing weakness in immunization performance and the additional uncertainty of the long-term impact of the flooding crisis, Pakistan has a high, increasing risk of failure to detect and interrupt WPV transmission by the end of 2011.

ANNEXES

Annex 1 – Data used for quarterly CDC assessments

Type of data	Description and source
Independent monitoring of polio SIAs	Independent monitoring data (e.g., the proportion of children monitored in a targeted area and age group that received an OPV dose during that SIA round) are collected at the district level both by surveying in households (house-to-house) and in public venues (outside the house) following each polio SIA. Implementation and data quality vary by country, and the geographic extent of monitoring varies by round. These data are collected by staff of national polio eradication programs or WHO country office staff and sent to WHO regional offices after each SIA; country independent monitoring datasets are then sent to WHO-HQ. Data used for this report are from SIAs conducted 1 January – 30 June 2010.
AFP surveillance	AFP surveillance data are collected by national polio eradication programs on an ongoing basis and sent weekly to WHO country and regional offices. Country AFP surveillance datasets are then sent to WHO-HQ. These data include age, numbers of OPV doses received, adequacy of stool specimen collection, and geographic information on AFP case-patients. The data used for the assessment in this report are from the preceding one year period.
Immunization coverage estimates	WHO/UNICEF coverage estimates are calculated annually to determine the proportion of children vaccinated by ~12 months of age through routine immunization. These estimates are based on data reported to WHO and UNICEF from country immunization programs, from independent coverage surveys of children 12–23 months of age, and from other relevant data. Data used for this report are the WHO/UNICEF estimates for 2009.[6]
Virologic characterization of poliovirus isolates	Basic characterizations of poliovirus isolates are carried out at national poliovirus testing laboratories. Genomic sequence analyses are conducted at global specialized laboratories. All data are coordinated and shared through the Global Polio Laboratory Network. WPV isolates from the period 1 January – 30 June 2010 were used in the analyses in this report and compared with isolates from earlier years.

Annex 2 – Major Process Indicators

Number	Time Period	Region	GPEI Major Process Indicator	Achieved
1	mid-2010	WPV importation belt	<10% missed children in 2 SIAs in all 'WPV importation belt' countries	Not yet for 2010
2	end-2010	All	Non-polio AFP rate >2 achieved at sub-national level in all endemic, re-established transmission and 'WPV importation belt' countries.	Not yet for 2010
3	end-2010	Angola	<10% missed children in all districts of Luanda, Benguela and Kwanza Sul during each SIA	No
4	end-2010	Chad	<10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010	Not yet known
5	end-2010	Democratic Republic of Congo	>80% adequate specimens in all provinces	Yes, thus far in 2010
6	end-2010	Democratic Republic of Congo	AFP rate >2 in all provinces	Yes, thus far in 2010
7	end-2010	Democratic Republic of Congo	<10% missed children in each SIA in Orientale, North & South Kivu (and all provincial capitals)	Not yet known
8	end-2010	Southern Sudan	>80% adequate specimens rates in all states	Not yet in 2010
9	end-2010	Southern Sudan	AFP rate >2 in all states.	Not yet in 2010
10	end-2010	Southern Sudan	<10% of missed children in each state during each SIA	No
11	end-2010	Afghanistan	<10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the Southern Region	Not yet in 2010
12	end-2010	India	>95% population immunity to type 1 polio in the persistent transmission areas of western Uttar Pradesh and central Bihar.	Data not yet available
13	end-2010	Nigeria	<10% 0-dose children (per NP AFP data) in each of the 12 high-risk states (including the 8 persistent transmission states)	Not yet in 2010
14	end-2010	Pakistan	<15% missed children during at least 8 SIAs in every district of the Quetta area and the persistent transmission districts and agencies of NWFP and FATA	To early to be determined for 2010
15	end-2010	Pakistan	<10% missed children during at least 4 SIAs in every town of Karachi	Not yet in 2010

Annex 3 – Stepwise Process for Immunization and Surveillance Performance Assessment

Diagrammatic version follows the text

Importation Belt/Importation Countries

Immunization Performance Assessment

The Major Process Indicator for immunization for the importation belt/importation countries refers to SIAs conducted during the entirety of 2010 (i.e., <10% missed children in 2 SIAs in 2010), and the indicator will be given a final assessment for each country at the end of the year. However, ≥1 polio SIA(s) were conducted, with independent monitoring, in many of these countries between 1 January and 30 June 2010. When available, the independent monitoring data from these SIAs were used to assess immunization performance for this report. The methodology used to assess immunization performance for countries with and without SIA monitoring data is detailed below.

Part A: The following refers to countries having had ≥2 polio SIAs as of 30 June in 2010. If the country being assessed has had one polio SIA or no polio SIAs as of 30 June in 2010, go to Parts B and C, respectively, below.

Step 1:

The country is first assessed regarding the Major Process Indicator for immunization (i.e., <10% missed children in 2 SIAs). The two most recent SIAs are considered, and the national-level independent monitoring data are used, pooled from monitored areas. For a given SIA, if both house to house and out of house monitoring were conducted, the highest percentage of missed children between the two is chosen for the assessment. If only house to house or only out of house monitoring was conducted in a given SIA, the percentage of missed children obtained is used for the assessment.

The percentage of missed children being assessed from each of the two SIAs is scored based upon the following criteria: strong (<10% missed children), intermediate (10-14% missed children), or weak (≥15% missed children). Once each percentage is graded, the Major Process Indicator for immunization is scored as indicated below:

If SIA #1 is	AND	If SIA#2 is	Then, the Major Process Indicator is
Strong		Strong	**STRONG**
Strong		Intermediate	**INTERMEDIATE**
Strong		Weak	**INTERMEDIATE**
Intermediate		Strong	**INTERMEDIATE**
Intermediate		Intermediate	**INTERMEDIATE**
Intermediate		Weak	**WEAK**
Weak		Strong	**INTERMEDIATE**
Weak		Intermediate	**WEAK**
Weak		Weak	**WEAK**

Step 2:

a) If the country received a score of weak for the Major Process Indicator for immunization (i.e., <10% missed children in 2 SIAs), it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) For countries with a score of intermediate for the Major Process Indicator for immunization (i.e., <10% missed children in 2 SIAs), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each of these supplemental indicators is graded, immunization performance is assessed as indicated below:

If Pol3 is	**AND**	**Zero Dose OPV is**	**Then, IMMUNIZATION PERFORMANCE is**
Strong		Strong	**INTERMEDIATE**
Strong		Intermediate	**INTERMEDIATE**
Strong		Weak	**INTERMEDIATE**
Intermediate		Strong	**INTERMEDIATE**
Intermediate		Intermediate	**INTERMEDIATE**
Intermediate		Weak	**INTERMEDIATE**
Weak		Strong	**INTERMEDIATE**
Weak		Intermediate	**INTERMEDIATE**
Weak		Weak	**WEAK**

c) For countries with a score of strong for the Major Process Indicator for immunization (i.e., <10% missed children in 2 SIAs), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	**AND**	**Zero Dose OPV is**	**Then, IMMUNIZATION PERFORMANCE is**
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Part B: The following refers to countries having had one polio SIA as of 30 June in 2010.

Step 1:
The country is first assessed regarding the Major Process Indicator for immunization (i.e., <10% missed children in its sole SIA). National-level independent monitoring data are used, pooled from monitored areas. For the sole SIA, if both house to house and out of house monitoring were conducted, the highest percentage of missed children between the two is chosen for the assessment. If only house to house or only out of house monitoring were conducted, the percentage of missed children obtained is used for the assessment.

The percentage of missed children being assessed from the sole SIA is scored based upon the following criteria: strong (<10% missed children), intermediate (10-14% missed children), or weak (≥15% missed children). Once the percentage is graded, the Major Process Indicator for immunization is scored as indicated below:

If the sole SIA is	**Then, the Major Process Indicator is**
Strong	**STRONG**
Intermediate	**INTERMEDIATE**
Weak	**INTERMEDIATE**

Step 2:

a) For countries with a score of intermediate for the Major Process Indicator for immunization (i.e., <10% missed children in its sole SIA), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	**AND**	**Zero Dose OPV is**	**Then, IMMUNIZATION PERFORMANCE is**
Strong		Strong	**INTERMEDIATE**
Strong		Intermediate	**INTERMEDIATE**
Strong		Weak	**INTERMEDIATE**
Intermediate		Strong	**INTERMEDIATE**
Intermediate		Intermediate	**INTERMEDIATE**
Intermediate		Weak	**INTERMEDIATE**
Weak		Strong	**INTERMEDIATE**
Weak		Intermediate	**INTERMEDIATE**
Weak		Weak	**WEAK**

b) For countries with a score of strong for the Major Process Indicator for immunization (i.e., <10% missed children in its sole SIA), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Part C: The following refers to countries having had no polio SIAs as of 30 June in 2010.

Step 1:

a) For countries that fall into this category, routine Pol3 estimates and zero dose OPV dose histories are considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**INTERMEDIATE**
Strong		Weak	**INTERMEDIATE**
Intermediate		Strong	**INTERMEDIATE**
Intermediate		Intermediate	**INTERMEDIATE**
Intermediate		Weak	**WEAK**
Weak		Strong	**INTERMEDIATE**
Weak		Intermediate	**INTERMEDIATE**
Weak		Weak	**WEAK**

Surveillance Performance Assessment

Step 1:

The country is first assessed regarding the Major Process Indicator for surveillance, (i.e., the proportion of sub-national areas with NPAFP rates >2 within the last 12 months). NPAFP rates are only calculated for sub-national areas where the population was ≥100,000. A state or province was considered to have a rate within an acceptable range if the upper 90% confidence limit was ≥2. When sub-national NPAFP rates are used, they are based upon upper 90% confidence limits.

For each country, the proportion of sub-national areas with NPAFP rates >2 within the last 12 months was scored according to the following criteria: strong (100% of sub-national areas with NPAFP rates >2), intermediate (80-99% of sub-national areas with NPAFP rates >2), or weak (<80% of sub-national areas with NPAFP rates >2).

Step 2:

a) If the country received a score of weak for the Major Process Indicator for surveillance (i.e., the proportion of sub-national areas with NPAFP rates >2), it is considered to have **WEAK SURVEILLANCE PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the surveillance performance assessment.

b) For countries with a score of intermediate for the Major Process Indicator for surveillance (i.e., the proportion of sub-national areas with NPAFP rates >2), the supplemental indicators - the national proportion of adequate stool specimens and genetic sequence data of WPV isolates - are then considered as follows:

Proportion of adequate stools: >80% (Strong), 65-80% (Intermediate), <65% (Weak)

Genetic sequence data: little evidence of missed chains of WPV transmission (Little), some evidence of missed chains of WPV transmission (Some)

Once each supplemental indicator is graded, surveillance performance is assessed as indicated below:

If Adequate Stools is	**AND**	**Genetic Evidence is**	**Then, SURVEILLANCE PERFORMANCE is**
Strong		Little	**INTERMEDIATE**
Strong		Some	**INTERMEDIATE**
Intermediate		Little	**INTERMEDIATE**
Intermediate		Some	**INTERMEDIATE**
Weak		Little	**WEAK**
Weak		Some	**WEAK**

c) For countries with a score of strong for the Major Process Indicator for surveillance (i.e., the proportion of sub-national areas with NPAFP rates >2), the supplemental indicators - the national proportion of adequate stool specimens and genetic sequence data of WPV isolates - are then considered as follows:

Proportion of adequate stools: >80% (Strong), 65-80% (Intermediate), <65% (Weak)

Genetic sequence data: little evidence of missed chains of WPV transmission (Little), some evidence of missed chains of WPV transmission (Some)

Once each supplemental indicator is graded, surveillance performance is assessed as indicated below:

If Adequate Stools is	**AND**	**Genetic Evidence is**	**Then, SURVEILLANCE PERFORMANCE is**
Strong		Little	**STRONG**
Strong		Some	**INTERMEDIATE**
Intermediate		Little	**INTERMEDIATE**
Intermediate		Some	**INTERMEDIATE**
Weak		Little	**WEAK**
Weak		Some	**WEAK**

Countries with Re-Established Wild Poliovirus Transmission

Angola

Immunization Performance Assessment

The Major Process Indicator for immunization for Angola refers to SIAs conducted during the entirety of 2010 (i.e., <10% missed children in all districts of Luanda, Benguela, and Kwanza Sul during each SIA in 2010). The indicator can be given a final assessment in this report due to these three provinces having had two SIAs between 1 January and 30 June 2010. However, many other provinces have had WPV cases in 2010. Angola's immunization performance for this report is assessed as described below.

Step 1:

Angola is first assessed regarding the Major Process Indicator for immunization (i.e., <10% missed children in all districts of Luanda, Benguela, and Kwanza Sul during each SIA in 2010). The Major Process Indicator for immunization is scored as indicated below:

If the indicator is met	Then, the Major Process Indicator is
Yes	**STRONG**
No	**WEAK**

Step 2:

a) If Angola receives a score of weak for the Major Process Indicator for immunization (i.e., <10% missed children in all districts of Luanda, Benguela, and Kwanza Sul during each SIA), it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) If Angola receives a score of strong for the Major Process Indicator for immunization (i.e., <10% missed children in all districts of Luanda, Benguela, and Kwanza Sul during each SIA), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Surveillance Performance Assessment

The surveillance performance assessment is conducted as described for the importation belt/importation countries.

Chad

Immunization Performance Assessment

The Major Process Indicator for immunization for Chad refers to SIAs conducted in the second half of 2010 (i.e., <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010) and will be given a final assessment at the end of 2010. However, five polio SIAs were conducted in Chad between 1 January and 30 June 2010 with some of the SIAs having been conducted, with independent monitoring, in the geographic areas stated in the indicator. These independent monitoring data from SIAs in the first half of 2010 were used to assess Chad's immunization performance for this report as described below.

Step 1:

Chad is first assessed regarding the Major Process Indicator for immunization (i.e., <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010). The Major Process Indicator for immunization is scored as indicated below:

If the indicator is met	Then, the Major Process Indicator is
Yes	**STRONG**
No	**WEAK**

Step 2:

a) If Chad receives a score of weak for the Major Process Indicator for immunization (i.e., <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010), it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) If Chad receives a score of strong for the Major Process Indicator for immunization (i.e., <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010),the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**

Weak	Intermediate	**STRONG**
Weak	Weak	**INTERMEDIATE**

Surveillance Performance Assessment

The surveillance performance assessment is conducted as described for the importation belt/importation countries.

Democratic Republic of the Congo (DRC)

Immunization Performance Assessment

DRC did not conduct polio SIAs between 1 January and 30 June 2010 in the geographic areas specified in the GPEI Strategic Plan; however, two rounds of SIAs were conducted in June 2010 in another geographic region of the country. The results of those two SIAs were used to score the Major Process Indicator for immunization, and the immunization performance assessment was conducted as described above for the importation belt/importation countries, Part A.

Surveillance Performance Assessment

Step 1:

DRC is first assessed regarding the Major Process Indicator for surveillance, (i.e., the proportion of sub-national areas with NPAFP rates >2 within the last 12 months). NPAFP rates are only calculated for sub-national areas where the population was ≥100,000. Because there is a specific Major Process Indicator for DRC that targets NPAFP>2, assessment is based on the reported values, not upon upper 90% confidence limits.

The proportion of sub-national areas with NPAFP rates >2 within the last 12 months was scored according to the following criteria: strong (100% of sub-national areas with NPAFP rates >2), intermediate (80-99% of sub-national areas with NPAFP rates >2), or weak (<80% of sub-national areas with NPAFP rates >2).

Step 2:

a) If DRC receives a score of weak for the Major Process Indicator for surveillance (i.e., the proportion of sub-national areas with NPAFP rates >2), it is considered to have **WEAK SURVEILLANCE PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the surveillance performance assessment.

b) If DRC receives a score of intermediate for the Major Process Indicator for surveillance (i.e., the proportion of sub-national areas with NPAFP rates >2), the supplemental indicators - the proportion of provinces with >80% adequate stool specimens and genetic sequence data of WPV isolates - are then considered as follows:

> Proportion of provinces with >80% adequate stool specimens: >80% (Strong), ≤80% (Weak)
>
> Genetic sequence data: little evidence of missed chains of WPV transmission (Little), some evidence of missed chains of WPV transmission (Some)

Once each supplemental indicator is graded, surveillance performance is assessed as indicated below:

If Adequate Stools is	**AND**	**Genetic Evidence is**	**Then, SURVEILLANCE PERFORMANCE is**
Strong		Little	**INTERMEDIATE**
Strong		Some	**INTERMEDIATE**
Weak		Little	**WEAK**

Weak	Some	**WEAK**

c) IF DRC receives a score of strong for the Major Process Indicator for surveillance (i.e., the proportion of sub-national areas with NPAFP rates >2), the supplemental indicators - the proportion of provinces with >80% adequate stool specimens and genetic sequence data of WPV isolates - are then considered as follows:

Proportion of provinces with >80% adequate stool specimens: >80% (Strong), ≤80% (Weak)

Genetic sequence data: little evidence of missed chains of WPV transmission (Little), some evidence of missed chains of WPV transmission (Some)

Once each supplemental indicator is graded, surveillance performance is assessed as indicated below:

If Adequate Stools is	**AND**	**Genetic Evidence is**	**Then, SURVEILLANCE PERFORMANCE is**
Strong		Little	**STRONG**
Strong		Some	**INTERMEDIATE**
Weak		Some	**WEAK**
Weak		Little	**WEAK**

Sudan

Immunization Performance Assessment

The Major Process Indicator for immunization for Sudan refers to SIAs conducted during the entirety of 2010 (i.e., <10% missed children in each state during each SIA in 2010). The indicator can be given a final assessment in this report since several states conducted SIAs between 1 January and 30 June 2010. Sudan's immunization performance for this report is assessed as described below.

Step 1:

Sudan is first assessed regarding the Major Process Indicator for immunization (i.e., <10% missed children in each state during each SIA in 2010). The Major Process Indicator for immunization is scored as indicated below:

If the indicator is met	**Then, the Major Process Indicator is**
Yes	**STRONG**
No	**WEAK**

Step 2:

a) If Sudan receives a score of weak for the Major Process Indicator for immunization (i.e. <10% missed children in each state during each SIA in 2010); it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) If Sudan receives a score of strong for the Major Process Indicator for immunization (i.e. <10% missed children in each state during each SIA in 2010), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Surveillance Performance Assessment

The surveillance performance assessment is conducted as described above for the Democratic Republic of the Congo. Because there is a specific Major Process Indicator for south Sudan that targets NPAFP>2, assessment is based on the reported values, not upon upper 90% confidence limits.

Countries with endemic WPV transmission

Afghanistan

Immunization Performance Assessment

Between 1 January and 30 June 2010, Afghanistan conducted four polio SIAs with independent monitoring in the geographic areas referred to in the Major Process Indicator for immunization (i.e., the 13 conflict-affected districts with persistent transmission in the southern region). While the Major Process indicator refers to SIAs conducted during the entirety of 2010, available data from the four SIAs conducted thus far were used to score the indicator.

Step 1:

Afghanistan is first assessed regarding the Major Process Indicator for immunization (i.e. <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the southern region in 2010). The Major Process Indicator for immunization is scored as indicated below:

If the indicator is met	Then, the Major Process Indicator is
Yes	**STRONG**
No	**WEAK**

Step 2:

a) If Afghanistan receives a score of weak for the Major Process Indicator for immunization (i.e. <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the southern region in 2010), it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) If Afghanistan receives a score of strong for the Major Process Indicator for immunization (i.e. <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent

transmission in the southern region in 2010), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	**AND**	**Zero Dose OPV is**	**Then, IMMUNIZATION PERFORMANCE is**
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Surveillance Performance Assessment

The surveillance performance assessment was conducted as described for the importation belt/importation countries.

India

Immunization Performance Assessment

The Major Process Indicator for 2010 for India is >95% population immunity to type 1 polio sustained in the persistent transmission areas of western Uttar Pradesh and achieved in the persistent transmission areas of central Bihar. Epidemiologic modeling has been done to estimate this; however the best estimate of target population immunity will be serosurveys underway in 2010 and available for analysis in future reports. In the interim, immunization performance for India for this report was assessed using SIA independent monitoring data from the two most recent rounds conducted in 2010, and the immunization performance assessment was conducted as described above for the importation belt/importation countries, Part A.

Surveillance Performance Assessment

The surveillance performance assessment was conducted as described for the importation belt/importation countries.

Nigeria

Immunization Performance Assessment

The Major Process Indicator for Nigeria for 2010 is <10% zero-dose children (per NPAFP data) in each of the 12 high-risk states (including the 8 persistent transmission states). Between 1 January and 30 June 2010, multiple polio SIAs were conducted in Nigeria in the relevant states, some with independent monitoring that is used for the immunization performance assessment described below.

Step 1:

Nigeria is first assessed regarding the Major Process Indicator for immunization [i.e., <10% zero-dose children (per NPAFP data) in each of the 12 high-risk states (including the 8 persistent transmission states)]. The Major Process Indicator for immunization is scored as indicated below:

If the indicator is met	Then, the Major Process Indicator is
Yes	**STRONG**
No	**WEAK**

Step 2:

a) If Nigeria receives a score of weak for the Major Process Indicator for immunization (i.e. <10% missed children in each state during each SIA in 2010); it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) If Nigeria receives a score of strong for the Major Process Indicator for immunization (i.e. <10% missed children in each state during each SIA in 2010), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Surveillance Performance Assessment

The surveillance performance assessment was conducted as described for the importation belt/importation countries.

Pakistan

Immunization Performance Assessment

The Major Process Indicator for immunization for Pakistan refers to SIAs conducted during the entirety of 2010 (i.e., <15% missed children during at least 8 SIAs in every district of the Quetta area and the persistent transmission districts and agencies of NWFP and FATA and <10% missed children during at least 4 SIAs in every town in Karachi) and will be given a final assessment at the end of 2010. Five polio SIAs, with independent monitoring, were conducted in the Quetta area and the persistent transmission districts and agencies of NWFP and FATA and in Karachi between 1 January and 30 June 2010. The independent monitoring data from these SIAs in the first half of 2010 were used to assess Pakistan's immunization performance for this report as described below.

Step 1:

Pakistan is first assessed regarding the Major Process Indicator for immunization (i.e., <15% missed children during at least 8 SIAs in every district of the Quetta area and the persistent transmission districts and agencies

of NWFP and FATA and <10% missed children during at least 4 SIAs in every town in Karachi). The Major Process Indicator for immunization is scored as indicated below:

If Quetta/NWFP/FATA indicator met	If Karachi indicator met	Then, the Major Process Indicator is
Yes	**Yes**	**STRONG**
No	**Yes**	**WEAK**
Yes	**No**	**WEAK**
No	**No**	**WEAK**

Step 2:

a) If Pakistan receives a score of weak for the Major Process Indicator for immunization (i.e. <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the southern region in 2010), it is considered to have **WEAK IMMUNIZATION PERFORMANCE.** The analysis of supplemental indicators is conducted; however the results are not considered for the immunization performance assessment.

b) If Pakistan receives a score of strong for the Major Process Indicator for immunization (i.e. <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the southern region in 2010), the supplemental indicators - routine Pol3 estimates and zero dose OPV histories - are then considered as follows:

Routine Pol3 coverage of: ≥90% (Strong), 75-89% (Intermediate), <75% (Weak)

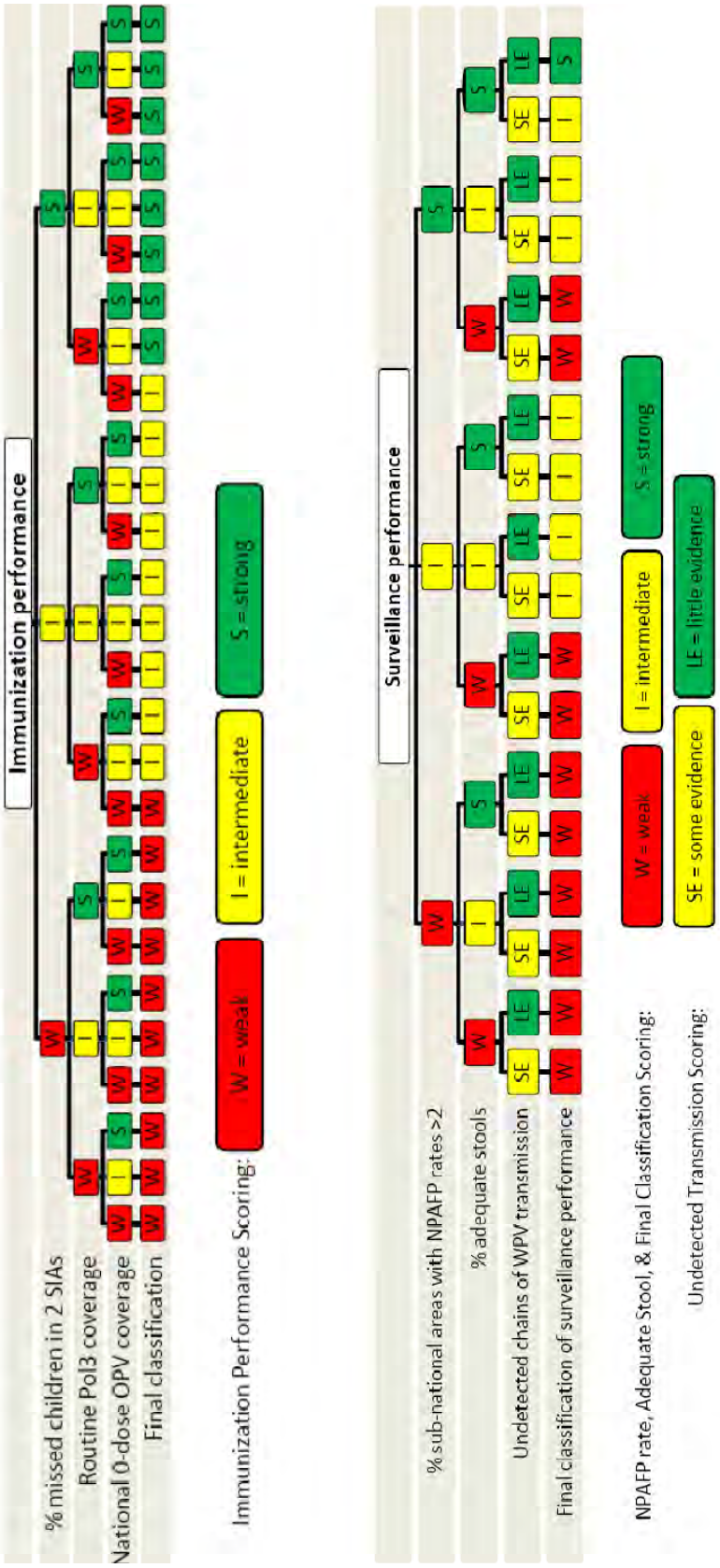
National zero dose OPV coverage of: ≤5 (Strong), 5-9% (Intermediate), ≥10% (Weak)

Once each supplemental indicator is graded, immunization performance is assessed as indicated below:

If Pol3 is	AND	Zero Dose OPV is	Then, IMMUNIZATION PERFORMANCE is
Strong		Strong	**STRONG**
Strong		Intermediate	**STRONG**
Strong		Weak	**STRONG**
Intermediate		Strong	**STRONG**
Intermediate		Intermediate	**STRONG**
Intermediate		Weak	**STRONG**
Weak		Strong	**STRONG**
Weak		Intermediate	**STRONG**
Weak		Weak	**INTERMEDIATE**

Surveillance Performance Assessment

The surveillance performance assessment was conducted as described for the importation belt/importation countries.


Immunization performance
% missed children in 2 SIAs
Routine Pol3 coverage
National 0-dose OPV coverage
Final classification
Immunization Performance Scoring:
W = weak
I = intermediate
S = strong
Surveillance performance
% sub-national areas with NPAFP rates >2
% adequate stools
Undetected chains of WPV transmission
Final classification of surveillance performance
NPAFP rate, Adequate Stool, & Final Classification Scoring:
W = weak
I = intermediate
S = strong
Undetected Transmission Scoring:
SE = some evidence
LE = little evidence

Annex 4 – Recent Poliovirus Epidemiology

Figure. Monthly case count by virus serotype and country classification

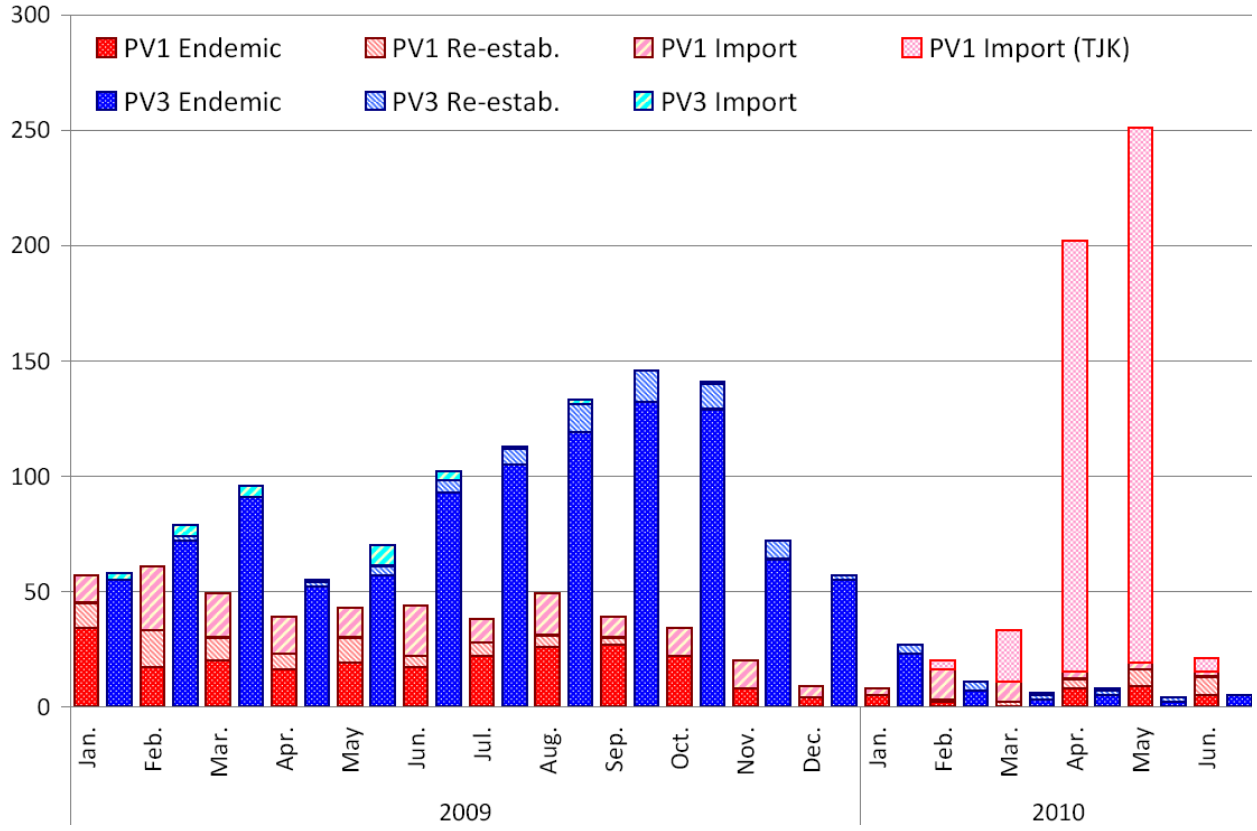


Table. cVDPV 2009 - 2010

Country	Serotype	Jan - Dec 2009 case count	Jan - Jun 2010 case count	Date of last case
Afghanistan*	2	1	1	10-Jun-10
Democratic Republic of the Congo	2	5	4	22-Apr-10
Ethiopia	2	1	0	16-Feb-09
	3	1	5	17-May-10
Guinea	2	1	0	06-May-09
India **	2	15	1	18-Jan-10
Nigeria*	2	154	9	21-May-10
Somalia	2	4	0	24-Dec-09

* Country reported at least 1 case with a July onset as of 16 August 2010

** cVDPV2 cases counts from India are reported by WHO-HQ

Table. Number of polio-affected districts in polio affected countries by country category of transmission, and by serotype, January–June 2009 and January–June 2010

Importation Countries		total districts in country	Serotype 1 Jan. - Jun. 2009	Serotype 1 Jan. - Jun. 2010	Serotype 3 Jan. - Jun. 2009	Serotype 3 Jan. - Jun. 2010	Serotype 1 or 3 Jan. - Jun. 2009	Serotype 1 or 3 Jan. - Jun. 2010	Serotype 1 or 3 % decrease	Date of most recent case
west and central Africa	Benin	77	14	0	0	0	14	0	100%	19-Apr-09
	Burkina Faso	63	9	0	0	0	9	0	100%	25-Oct-09
	Cameroon	173	0	0	0	0	0	0	n/a	15-Oct-09
	Central African Republic	24	0	0	1	0	1	0	100%	09-Aug-09
	Cote d'Ivoire	72	19	0	0	0	19	0	100%	06-Aug-09
	Guinea	38	10	0	0	0	10	0	100%	03-Nov-09
	Liberia	15	4	1	0	0	4	1	75%	03-Mar-10
	Mali	59	1	3	0	0	1	3	-200%	01-May-10
	Mauritania	53	0	4	0	0	0	4	n/a	28-Apr-10
	Niger	42	1	0	9	1	10	1	90%	01-Apr-10
	Senegal	65	0	11	0	0	0	11	n/a	30-Apr-10
	Sierra Leone	13	0	1	0	0	0	1	n/a	28-Feb-10
	Togo	35	5	0	0	0	5	0	100%	28-Mar-09
east	Burundi	41	0	0	0	0	0	0	n/a	12-Sep-09
	Kenya	78	3	0	0	0	3	0	100%	30-Jul-09
	Uganda	80	2	0	0	0	2	0	100%	10-May-09
Asia	Nepal	75	0	2	0	0	0	2	n/a	09-Jun-10
	Tajikistan	66	0	35	0	0	0	35	n/a	04-Jul-10

Re-established Countries	total districts in country	Serotype 1 Jan. - Jun. 2009	Serotype 1 Jan. - Jun. 2010	Serotype 3 Jan. - Jun. 2009	Serotype 3 Jan. - Jun. 2010	Serotype 1 or 3 Jan. - Jun. 2009	Serotype 1 or 3 Jan. - Jun. 2010	Serotype 1 or 3 % decrease	Date of most recent case
Angola	164	6	10	0	0	6	10	-67%	02-Jul-10
Chad	61	0	0	6	9	6	9	-50%	22-May-10
Democratic Republic of Congo	515	0	3	2	0	2	3	-50%	11-Jul-10
Sudan	135	24	0	0	0	24	0	100%	27-Jun-09

Endemic Countries	total districts in country	Serotype 1 Jan. - Jun. 2009	Serotype 1 Jan. - Jun. 2010	Serotype 3 Jan. - Jun. 2009	Serotype 3 Jan. - Jun. 2010	Serotype 1 or 3 Jan. - Jun. 2009	Serotype 1 or 3 Jan. - Jun. 2010	Serotype 1 or 3 % decrease	Date of most recent case
Afghanistan	329	10	4	1	6	11	10	9%	09-Jul-10
India	626	16	5	26	11	32	15	53%	21-Jul-10
Nigeria	774	49	3	147	3	187	6	97%	18-Jun-10
Pakistan	135	11	9	6	10	16	15	6%	20-Jul-10

Year to date comparisons are based on cases with dates of onset between 1-Jan and 30-Jun.
WPV1 and WPV3 co-infections are counted as Serotype 1

Annex 5 – Major Process Indicator Details

#1 <10% missed children in 2 SIAs in all 'WPV importation belt' countries. (Strictly applied criteria)

	Country	Start date of SIA	Percent missed children		Type of SIA	Percent of districts		Achieved (last 2 SIAs)
			(house to house)	(out of house)		Targeted in SIA	Targeted districts monitored	
1	Benin	06-Mar-10	2.4		NID	70	100	Yes
		24-Apr-10	2.9	6.9	NID	100	95	
2	Burkina Faso	06-Mar-10	3.7		NID	100	100	No
		02-Apr-10	2.7		NID	100	100	
		07-May-10	2.8	15.5	NID	100	100	
		28-May-10	1.2	5.8	sNID	54	100	
3	Cameroon	05-Mar-10	8.8	16.4	sNID	36	45	No
		23-Apr-10	7.8	11.7	sNID	36	54	
4	Central African Republic	05-Mar-10	9.8	13.6	NID	100	67	No
		23-Apr-10	10.1	10.2	NID	100	67	
5	Cote d'Ivoire	26-Mar-10	2.4	7.8	NID	100	100	Yes
		23-Apr-10	2.4	4.9	NID	100	100	
6	Ethiopia	11-Jun-10	14.8	16.9	sNID	8	100	No
7	Eritrea	No independent monitoring data						
8	Gambia	06-Mar-10	4.6	35.1	NID	100	100	Yes
		24-Apr-10	1.9	5.5	NID	100	100	
		28-May-10	2.4	4.3	NID	100	100	
		25-Jun-10	2.7	5.5	NID	100	100	
9	Ghana	05-Mar-10	4.6	2.5	NID	100	51	Yes
		23-Apr-10	4.8	2.7	NID	100	50	
10	Guinea	06-Mar-10	7.3	10.2	NID	100	100	Yes
		27-Mar-10	0.2	1.9	NID	100	100	
		24-Apr-10	0.2	3.2	NID	100	100	
		28-May-10	0.1	1.5	NID	100	100	
11	Guinea-Bissau	06-Mar-10	4.7	8.5	NID	100	64	Yes
		24-Apr-10	2.7	5	NID	100	64	
		28-May-10	1.9	0.8	NID	100	100	
12	Liberia	05-Mar-10	2	10.7	NID	100	100	Yes
		23-Apr-10	4.1	5.3	NID	100	100	
		28-May-10	3	3.6	NID	100	100	
		25-Jun-10	5	5.2	NID	100	100	
13	Mali	06-Mar-10	11.2		NID	100	95	Yes
		26-Mar-10	2.9	10.1	sNID	14	100	
		24-Apr-10	5.9	11	NID	100	97	
		28-May-10	5.7	7.5	NID	100	78	
		25-Jun-10	5.7	7.6	sNID	86	100	
14	Mauritania	16-Feb-10	34.6		NID	100	89	No
		06-Mar-10	26.8	38.3	NID	100	89	
		27-Mar-10	23.7	24.9	NID	100	89	
		24-Apr-10	13.4	13.8	NID	100	96	
		28-May-10	12.6	12.3	NID	100	96	
		25-Jun-10	5.2	5.7	NID	100	96	
15	Niger	26-Mar-10	4	7.7	NID	100	100	Yes
		24-Apr-10	3	5	NID	100	100	
		28-May-10	4	9.1	sNID	31	100	
16	Senegal	06-Feb-10	11.6	18.1	sNID	94	92	Yes
		27-Mar-10	6.7	8.6	NID	94	97	
		24-Apr-10	6	7.8	NID	94	98	
		29-May-10	5	8.3	NID	94	98	
		26-Jun-10	4.7	9.6	NID	94	98	
17	Sierra Leone	06-Mar-10	11.4	17.3	NID	100	100	No
		26-Mar-10	9.4	13.1	NID	100	100	
		07-May-10	10.5	14	NID	100	100	
		28-May-10	12	14.9	NID	100	100	
18	Somalia	No independent monitoring data						
19	Togo	01-Apr-10	4.4	10.8	NID	100	100	No
		14-May-10	4	10.4	NID	100	100	

#2 Non-polio AFP rate >2 achieved at sub-national level in all endemic, re-established transmission and 'WPV importation belt' countries. (Strictly applied criteria)

NOTE: List includes "importation countries"

	Country	Number of state\provinces with > 100,000 children under 15 y/o		
		NPAFP rate		
		>= 2	< 2	silent
1	AFGHANISTAN	31	0	0
2	ANGOLA	16	2	0
3	BENIN	9	3	0
4	BURKINA FASO	13	0	0
5	BURUNDI	13	4	0
6	CAMEROON	7	3	0
7	CAPE VERDE		1	0
8	CENTRAL AFRICAN REPUBLIC	6	0	0
9	CHAD	17	0	0
10	COTE D'IVOIRE	17	2	0
11	DEMOCRATIC REPUBLIC OF CONGO	11	0	0
12	DJIBOUTI	1	0	0
13	ERITREA	5	0	0
14	ETHIOPIA	8	2	0
15	GAMBIA	not able to calculate rate		
16	GHANA	6	4	0
17	GUINEA	6	2	0
18	GUINEA-BISSAU	2	0	1
19	INDIA	32	2	0
20	KENYA	4	4	0
21	LIBERIA	2	3	0
22	MALI	5	3	0
23	MAURITANIA	5	1	1
24	NEPAL	5	0	0
25	NIGER	8	0	0
26	NIGERIA	37	0	0
27	PAKISTAN	6	1	0
28	SENEGAL	11	0	0
29	SIERRA LEONE	4	0	0
30	SOMALIA	14	2	0
31	SUDAN	23	2	0
32	TAJIKISTAN	4	1	0
33	TOGO	4	2	0
34	UGANDA	37	27	1

#3 Angola: <10% missed children in all districts of Luanda, Benguela and Kwanza Sul during each SIA

Province	District	Percent of under 5 y/o population within province	Round 1			Round 2		
			SIA start date	Missed H2H	Missed OUT	SIA start date	Missed H2H	Missed OUT
LUANDA under 5 pop: 1,526,254	Cacuaco	13.8	07-May-10	3.8	1.7	11-Jun-10	**23.5**	**33.1**
	Cazenga	22.3	07-May-10	**19.7**	**18.9**	11-Jun-10	**17.2**	**20.1**
	Ingombota	2.9	07-May-10	**13.4**	7.9	11-Jun-10	9	8
	Kilamba Kiaxi	13.8	07-May-10	**26.7**	**27.1**	11-Jun-10	**27.7**	**35.4**
	Maianga	10.3	07-May-10	**11.4**	**10.1**	11-Jun-10	**12.4**	**19.1**
	Rangel	2.8	07-May-10	8.2	3.7	11-Jun-10	4.5	**10.8**
	Samba	5.1	07-May-10	**11.7**	**12**	11-Jun-10	**43.7**	**49.5**
	Sambizanga	10.3	07-May-10	**12.2**	**15.7**	11-Jun-10	**19.1**	**17**
	Viana	18.7	07-May-10	9.9	**13.4**	11-Jun-10	8.3	**15.3**
BENGUELA under 5 pop: 733,878	Baia Farta	3.9	07-May-10	**23**	9.8	11-Jun-10	**12.9**	4.1
	Balombo	7.3	no data					
	Benguela	22.8	07-May-10	8.4	**16.9**	11-Jun-10	**13.7**	**17.9**
	Bocoio	4	no data					
	Caimbambo	4.2	no data					
	Chongoroi	4.4	07-May-10	**15.3**	**28.3**	11-Jun-10	4.9	4.8
	Cubal	8.7	no data					
	Ganda	12	07-May-10	6.5	7.4			
	Lobito	32.8	07-May-10	1.4	3.7	11-Jun-10	**10.3**	8.7
KUANZA SUL under 5 pop: 344,599	Amboim	11.6	07-May-10	**13.4**	6.4	11-Jun-10	**22.1**	**34.1**
	Cassongue	9.8	no data					
	Cela	11.2	no data					
	Conda	4.9	no data					
	Ebo	10.5	no data					
	Kibala	11.3	07-May-10	5	4.8	11-Jun-10	8.4	8.8
	Kilenda	5.7				11-Jun-10	3.3	7.8
	Libolo	4.7				11-Jun-10	4.4	7.1
	Mussende	5.2	no data					
	Porto Amboim	6.9	07-May-10	**19.5**	**16.4**	11-Jun-10	**19.9**	**30.9**
	Seles	8.5	no data					
	Sumbe	9.8	07-May-10	9.9	9.9	11-Jun-10	17.3	17.2

#4 Chad: <10% missed children in greater N'Djamena and in the southern and eastern WPV transmission zones during each SIA in the second half of 2010

Zones	Province	Districts	All SIAs combined			
			House to house		Out of house	
			Total checked	Percent missed	Total checked	Percent missed
Eastern zone	OUADDAI	Abéché	11647	**11.7**	468	**28.2**
		Adré	No data			
Greater N'Djamena	CHARI BAGUIRMI	Bousso	508	**31.9**	1084	9.5
		Dourbali	No data		609	5.4
		Mandelia	1638	**13.6**	1638	**13.6**
		Massenya	No data			
	NDJAMENA	N'Djaména Centre	1005	**11.3**	186	**15.1**
		N'Djaména Est	1567	**17.2**	988	**26.7**
		N'Djaména Nord	1125	6.5	531	**15.8**
		N'Djaména Sud	1864	**12.3**	941	**32.3**
Southern zone	LOGONE OCCIDENTAL	Benoye	496	3.6	226	8
		Laokassy	609	1	214	5.1
		Moundou	2810	**13**	376	9
	LOGONE ORIENTAL	Bebedjia	980	9.4	537	**23.3**
		Beboto	No data			
		Bessao	202	3.5	137	**16.8**
		Doba	6851	7.3	1463	**10.9**
		Goré	372	9.7	168	7.7
	MANDOUL	Bedjondo	No data			
		Goundi	320	8.4	78	2.6
		Koumra	628	4.5	No data	
		Moissala	No data			
	MOYEN CHARI	Danamadji	2100	9.8	472	1.7
		Kyabé	2366	**14.2**	781	**20.1**
		Sarh	4881	4.7	1758	**13.8**

#5 & 6 Democratic Republic of the Congo: >80% adequate specimens in all provinces (Strictly applied criteria)

Democratic Republic of the Congo: AFP rate >2 in all provinces (Strictly applied criteria)

Province	Population	NPAFP rate		Adequate stool	
		Rate	Achieved	Percent	Achieved
BANDUNDU	3542100	4.7	Yes	89.2	Yes
BAS-CONGO	1530537	4.1	Yes	92.1	Yes
EQUATEUR	3961445	3.4	Yes	83.8	Yes
KASAI OCCIDENTAL	3312540	5.3	Yes	80.4	Yes
KASAI ORIENTAL	4194165	4.7	Yes	84.7	Yes
KATANGA	5050963	5.1	Yes	82.5	Yes
KINSHASA	3255850	3.7	Yes	84.7	Yes
MANIEMA	922298	4.8	Yes	87.0	Yes
NORD KIVU	2917051	2.7	Yes	88.8	Yes
ORIENTAL	4354977	6.7	Yes	94.6	Yes
SUD KIVU	2243127	6.0	Yes	88.9	Yes

#7 Democratic Republic of the Congo: <10% missed children in each SIA in Orientale, North & South Kivu (and all provincial capitals)

Province	Districts	Round 1: 4 June 2010				Round 2: 18 June 2010			
		House to house		Out of house		House to house		Out of house	
		Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed
Orientale		no data				no data			
North Kivu		no data				no data			
South Kivu		no data				no data			
all provincial capitals		no data				no data			
Others provinces not mentioned in the GPEI Strategic Plan:									
Bandundu	Districts monitored did not include capitals	861	11.4	251	37.8	951	13.0	207	7.7
Kasai-Occidental		2748	4.1	1380	6.4	2756	12.3	961	5.5

#8 & 9

southern Sudan: >80% adequate specimens rates in all states (Strictly applied criteria)

southern Sudan: AFP rate >2 in all states. (Strictly applied criteria)

Province	Population	NPAFP rate		Adequate stool	
		Rate	Achieved	Percent	Achieved
CENTRAL EQUATORIA (BAHR EL JEBEL)	596987	3.5	Yes	86.4	Yes
EASTERN EQUATORIA	545852	3.5	Yes	**78.9**	**No**
JONGLEI	795844	3.1	Yes	100.0	Yes
LAKES	608953	4.3	Yes	84.6	Yes
NORTH BAHR EL GHAZAL	799582	**1.9**	**No**	86.7	Yes
UNITY	717315	2.4	Yes	94.1	Yes
UPPER NILE	680394	4.3	Yes	89.7	Yes
WARAB	1203508	2.4	Yes	**79.3**	**No**
WEST BAHR EL GHAZAL	256216	5.5	Yes	**78.6**	**No**
WESTERN EQUATORIA	414535	7.7	Yes	81.3	Yes

#10 southern Sudan: <10% of missed children in each state during each SIA

State	Round 1: Feb. 2010				Round 2: Mar. 2010			
	House to house		Out of house		House to house		Out of house	
	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed
Central Equatoria	3240	1.4	no data		3054	4.8	no data	
Eastern Equatoria	1978	**19.2**	no data		788	**20.1**	no data	
Jonglei	3932	7.6	no data		7452	6.8	no data	
Lakes	2489	**20.9**	no data		5642	**16.1**	no data	
Northern Bahr El Ghaza	2266	**13.2**	no data		1906	**16.1**	no data	
Unity	834	**13.7**	no data		1428	**18.8**	no data	
Upper Nile	1707	**12.4**	no data		1702	6.2	no data	
Warrap	1521	**11.2**	no data		3187	**14.9**	no data	
Western Bahr El Ghaza	902	5.5	no data		2546	4.1	no data	
Western Equatoria	4564	6.1	no data		4364	5.8	no data	

#11 Afghanistan: <10% missed children during at least 4 SIAs in each of the 13 conflict-affected districts with persistent transmission in the Southern Region

Province	District	Round 1: Feb. 2010				Round 2: Mar. 2010				Round 3: May 2010				Round 4: Jun. 2010			
		House to house		Out of house		House to house		Out of house		House to house		Out of house		House to house		Out of house	
		Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed
HELMAND	Bust (LashKar	3249	29.9	513	32.6	2936	19.1	540	27.8	2382	23.4	628	19.4	2437	17.3	617	27.7
	Musa Qala	2607	18.5			3069	8.1			2909	12.9			3145	16.4		
	Naw Zad					2065	91.8			1882	77.7			2360	84.5		
	Nad-E Ali					1489	53.3			3052	54.8			2042	63.6		
	Sarban Qala (Sangin)	1704	24.1			1844	15.2			1654	16.3			1800	14.6		
KANDAHAR	Qandahara /Dand	5063	7.6	592	32.1	5453	9.0	653	34.8	5139	6.5	615	29.8	4380	11.0	890	22.9
	Shah Wali Kot	797	78.2			716	77.2			755	80.5			890	83.6		
	Maiwand	2823	11.7			3223	13.3			3580	10.7			3435	12.7		
	Panjwai	531	5.6			632	78.2			506	77.1			627	80.4		
	Spin Boldak	1267	13.6			1152	8.2			1150	19.3			1176	19.0		
URUZGAN	Tirin Kot	2238	19.1	436	34.9	2108	19.8	464	23.3	1803	19.9	583	34.6	2065	22.6	554	19.3
	Shahid Hassas	725	8.8			777	13.5			759	17.3			725	13.8		
	Deh Rawud	994	18.8			1326	13.2			1609	12.0			1573	8.9		

#13 Nigeria: <10% 0-dose children (per NP AFP data) in each of the 12 high-risk states (including the 8 persistent transmission states)

Province	Number of 0-dose NPAFP cases	Total number of NPAFP case	Percent 0-dose	Achieved
Bauchi	0	64	0	Yes
Borno	5	70	7.1	Yes
Gombe	0	59	0	Yes
Jigawa	3	86	3.5	Yes
Kaduna	1	93	1.1	Yes
Kano	41	208	**19.7**	**No**
Katsina	8	121	6.6	Yes
Kebbi	0	98	0	Yes
Niger	0	104	0	Yes
Sokoto	1	87	1.1	Yes
Yobe	10	82	**12.2**	**No**
Zamfara	4	101	4.0	Yes

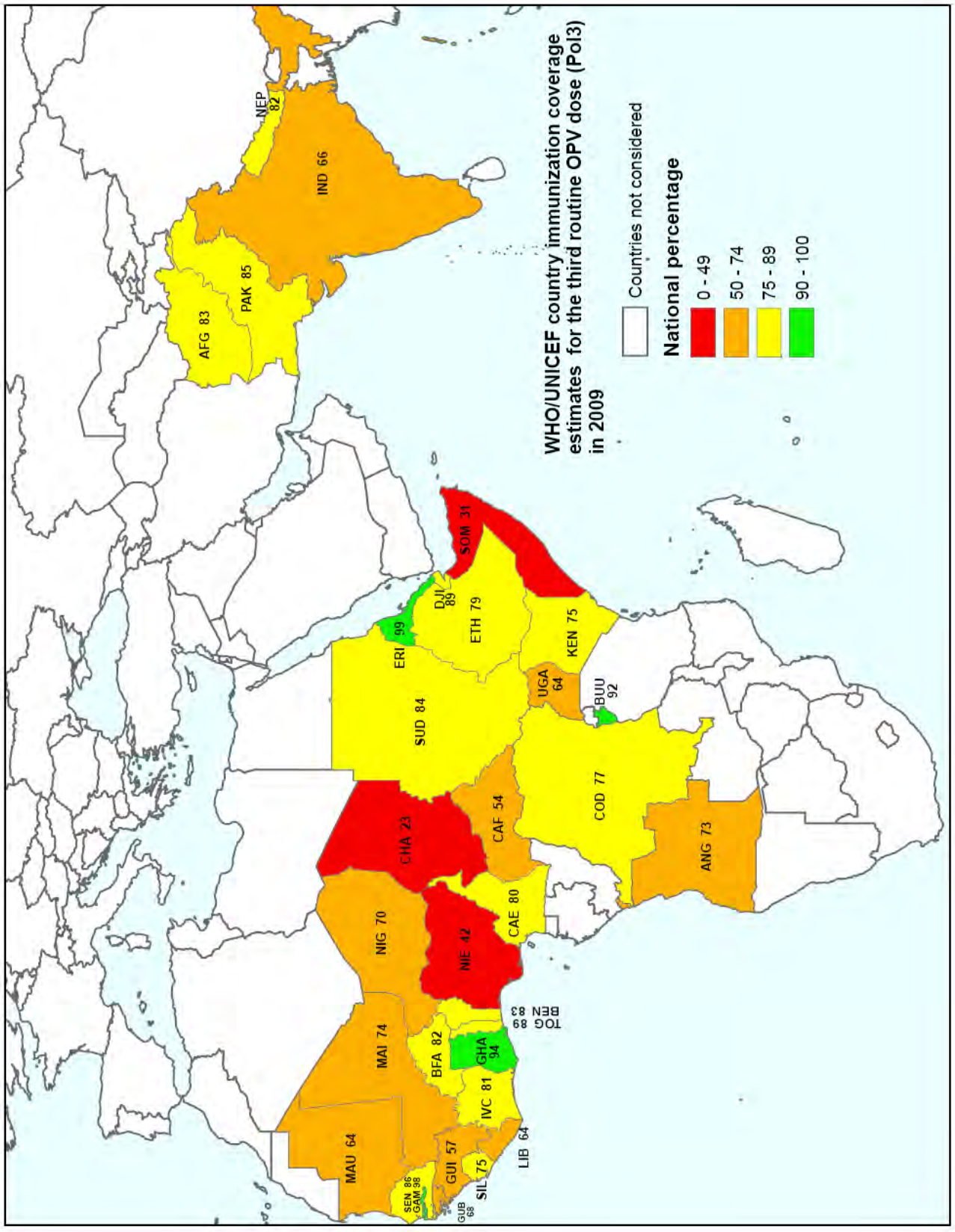
#14 & 15 Pakistan: <15% missed children during at least 8 SIAs in every district of the Quetta area and the persistent transmission districts and agencies of NWFP and FATA

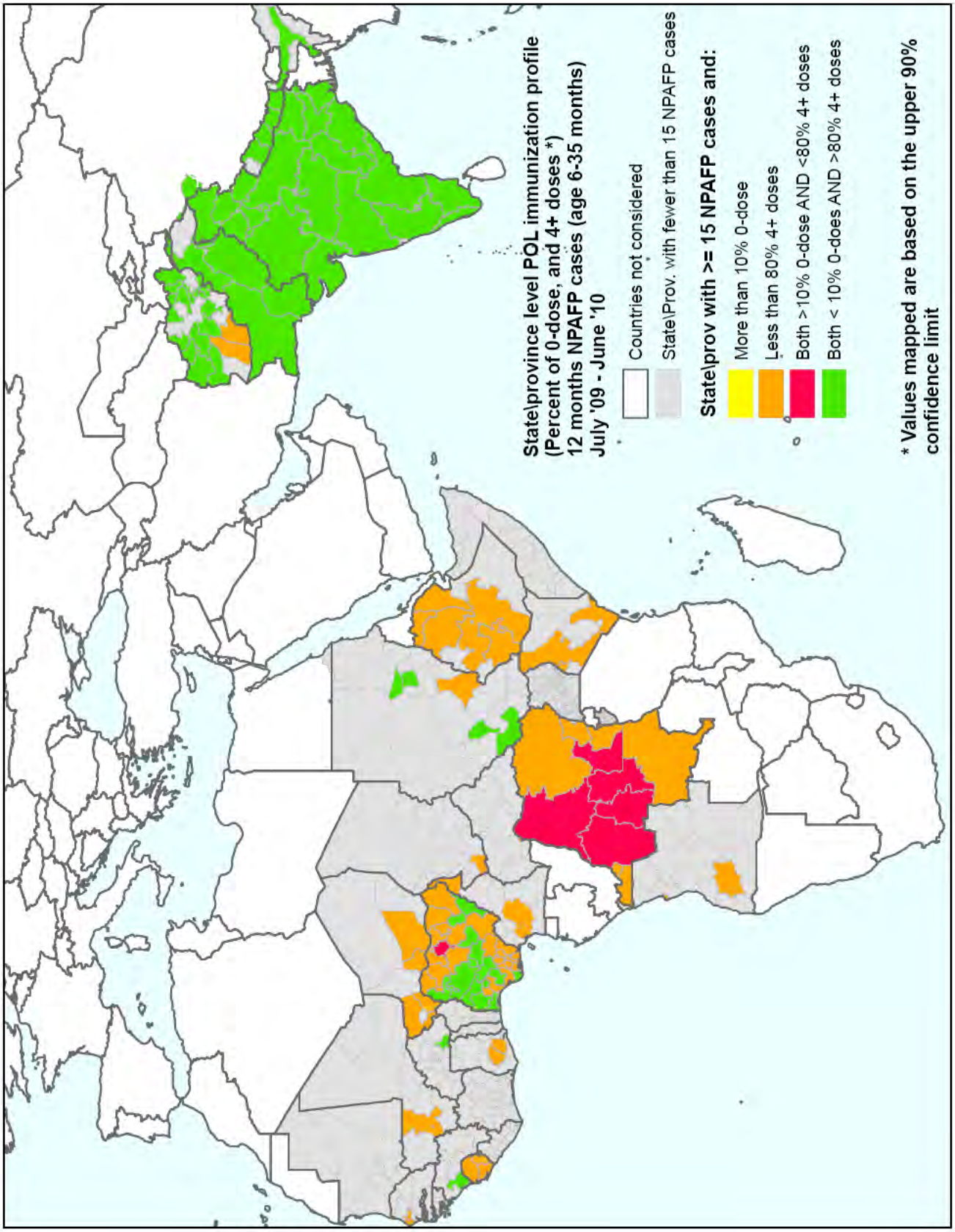
Pakistan: <10% missed children during at least 4 SIAs in every town of Karachi

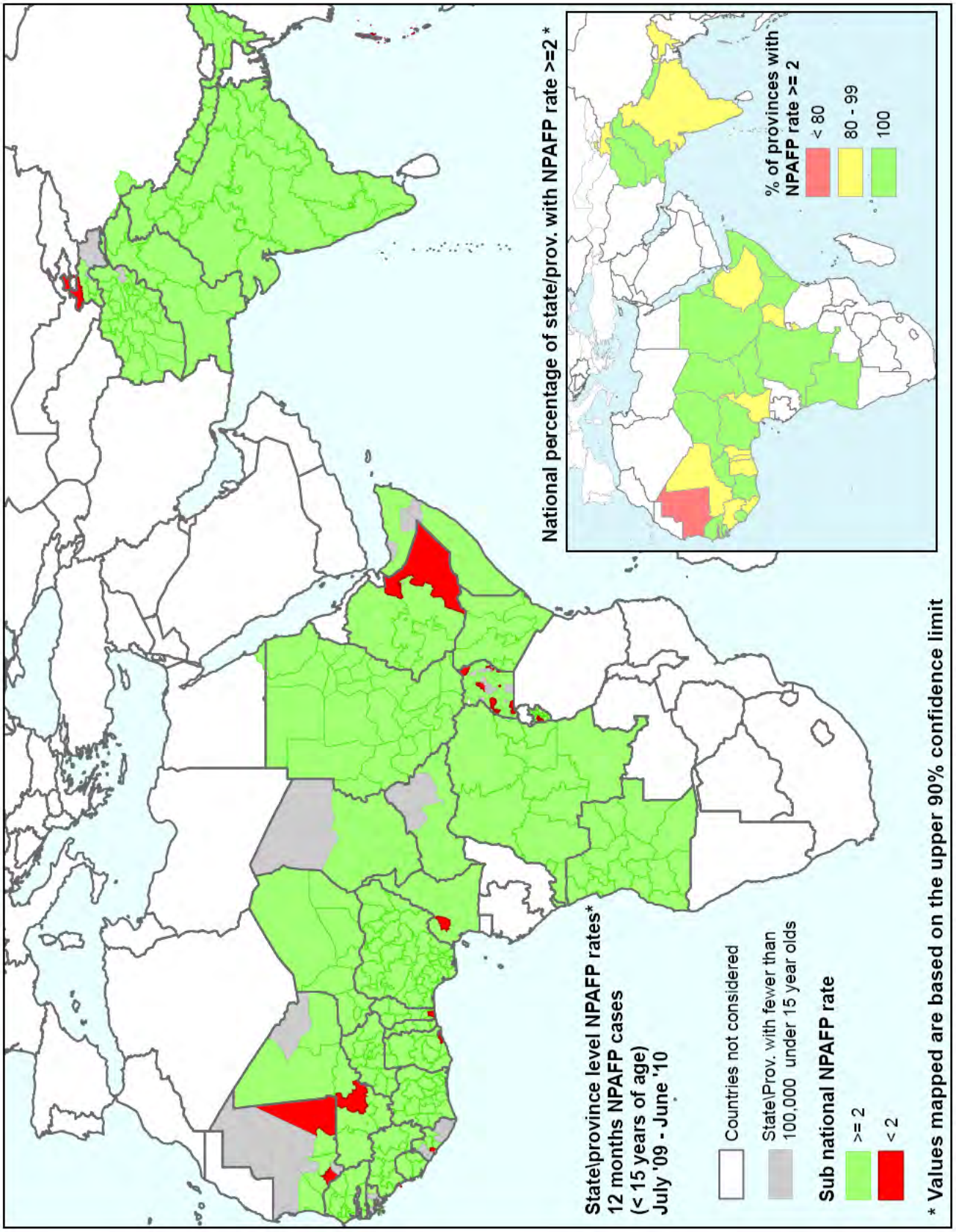
Province	District	Round 1: Jan. 2010		Round 2: Feb. 2010		Round 3: Mar. 2010		Round 4: Apr. 2010		Round 5: May 2010	
		House to house		House to house		House to house		House to house		House to house	
		Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed
KHYBER-PAKHTUNKHWA (NWFP)	Peshawar	2037	7.7	2179	6.5	7276	11.9	5310	4.8	6386	4.7
FATA	Bajour	1587	9.1	1429	10.2	2541	11.0	2381	14.6	2852	4.8
	Khyber	537	5.2	392	4.8	961	5.8	1042	2.9	1205	1.4
	Mohmand	1279	5.9	1268	9.5	2058	6.2	2164	5.6	2395	6.4
BALOCHISTAN	Quetta	1939	**20.4**	2006	8.7	2049	9.5	1717	7.8	2101	7.7
	Killa Abdullah	1391	13.8	1520	**16.6**	1829	12.2	1874	10.6	1819	12.9
	Pishin	1299	12.5	1546	6.6	1523	8.8	1716	9.1	1853	7.5

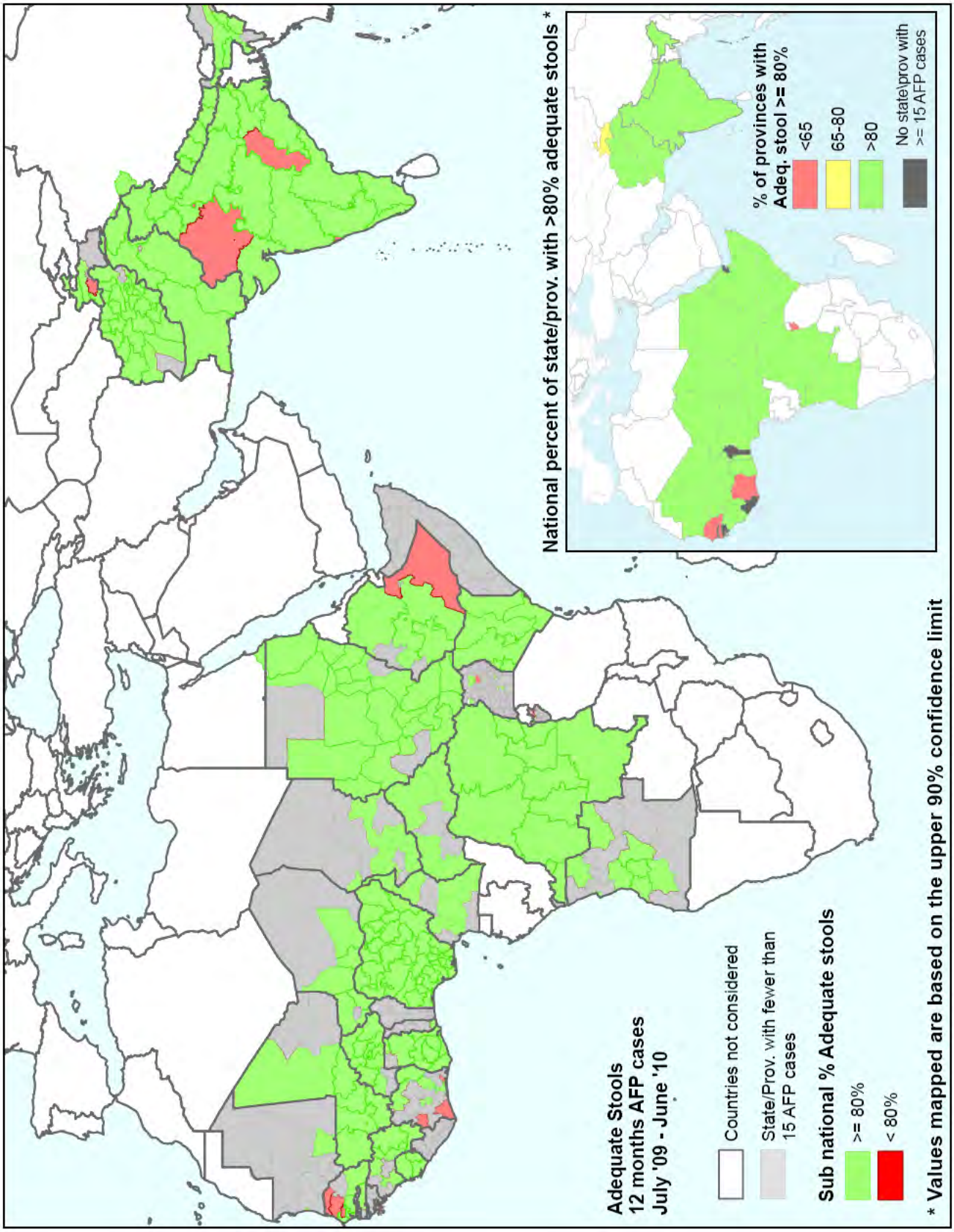
District	Town	Round 1: Jan. 2010		Round 2: Feb. 2010		Round 3: Mar. 2010		Round 4: Apr. 2010		Round 5: May 2010	
		House to house		House to house		House to house		House to house		House to house	
		Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed	Total checked	Percent missed
KARACHI	Kemari	313	**10.9**	170	**32.9**	219	**18.3**	204	3.9	168	8.3
	SITE	336	**27.1**	306	2.6	232	6.5	223	1.3	207	**12.1**
	Baldia	321	**13.7**	383	9.7	327	**18.3**	335	5.1	355	9.9
	Orangi	396	**26.8**	299	**14.7**	265	9.8	273	9.2	308	6.8
	Lyari	321	5.9	149	**14.1**	271	3.0	220	1.8	247	1.6
	Saddar	341	6.7	166	**16.9**	219	**10.0**	186	**10.2**	296	**17.6**
	Jamsheed	287	**21.6**	331	6.9	302	6.0	196	1.5	267	3.0
	Gulshan-e-Iqbal	227	8.8	548	7.1	495	4.4	526	4.0	633	4.9
	Shah Faisal	161	8.1	77	5.2	120	9.2	99	3.0	136	3.7
	Korangi	301	5.3	239	3.8	186	4.8	202	8.4	200	5.5
	Landhi	325	2.2	232	7.8	197	5.1	218	5.0	244	4.9
	North Nazimabad	371	**21.0**	241	**27.0**	193	7.3	144	9.0	175	8.0
	North Karachi	349	**17.2**	328	9.8	274	**20.8**	252	4.0	291	**10.3**
	Gulberg	180	**13.9**	173	**11.0**	186	**33.3**	180	**10.0**	187	**19.8**
	Liaquatabad	350	**12.6**	254	**20.1**	190	9.5	198	**17.2**	206	3.4
	Bin Qasim	263	1.5	159	8.8	184	**20.1**	176	7.4	209	3.3
	Gadap	418	**27.8**	494	8.9	374	8.8	414	**10.1**	451	9.3
	Malir	202	5.9	104	9.6	133	1.5	125	6.4	147	2.7

Annex 6 – Maps of immunization and surveillance performance




Statelprovince level POL immunization profile
(Percent of 0-dose, and 4+ doses *)
12 months NPAFP cases (age 6-35 months)
July '09 - June '10
Countries not considered
State\Prov. with fewer than 15 NPAFP cases
Statelprov with >= 15 NPAFP cases and:
More than 10% 0-dose
Less than 80% 4+ doses
Both >10% 0-dose AND <80% 4+ doses
Both < 10% 0-does AND >80% 4+ doses
* Values mapped are based on the upper 90% confidence limit


National percentage of state/prov. with NPAFP rate >=2 *
% of provinces with NPAFP rate >= 2
< 80
80 - 99
100
State\province level NPAFP rates*
12 months NPAFP cases
(< 15 years of age)
July '09 - June '10
Countries not considered
State\Prov. with fewer than 100,000 under 15 year olds
Sub national NPAFP rate
>= 2
< 2
* Values mapped are based on the upper 90% confidence limit


National percent of state/prov. with >80% adequate stools *
% of provinces with Adeq. stool >= 80%
<65
65-80
>80
No state\prov with >= 15 AFP cases
Adequate Stools
12 months AFP cases
July '09 - June '10
Countries not considered
State/Prov. with fewer than 15 AFP cases
Sub national % Adequate stools
>= 80%
< 80%
* Values mapped are based on the upper 90% confidence limit