

# Global Polio Eradication: Current Status, Challenges and Future Directions

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Centers for Disease Control and Prevention, Atlanta

APHA 2007 Annual Meeting

5 November 2007

Washington D.C.

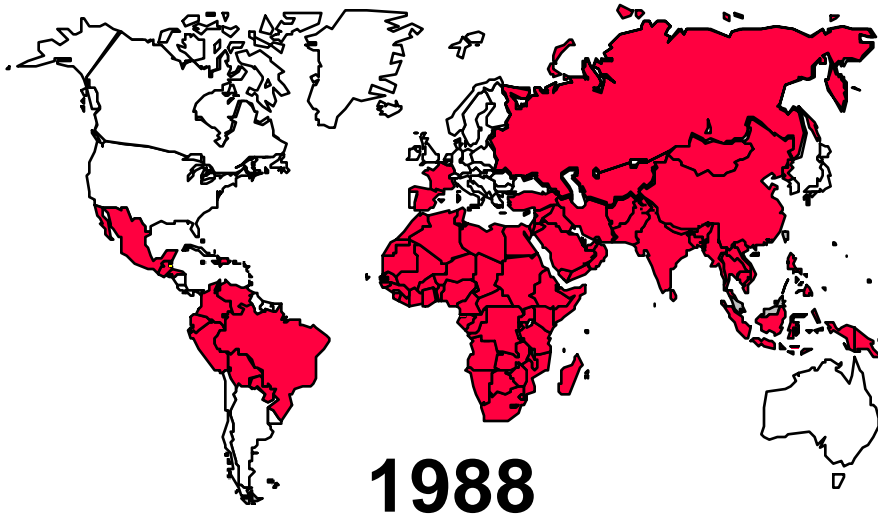


DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR DISEASE CONTROL AND PREVENTION

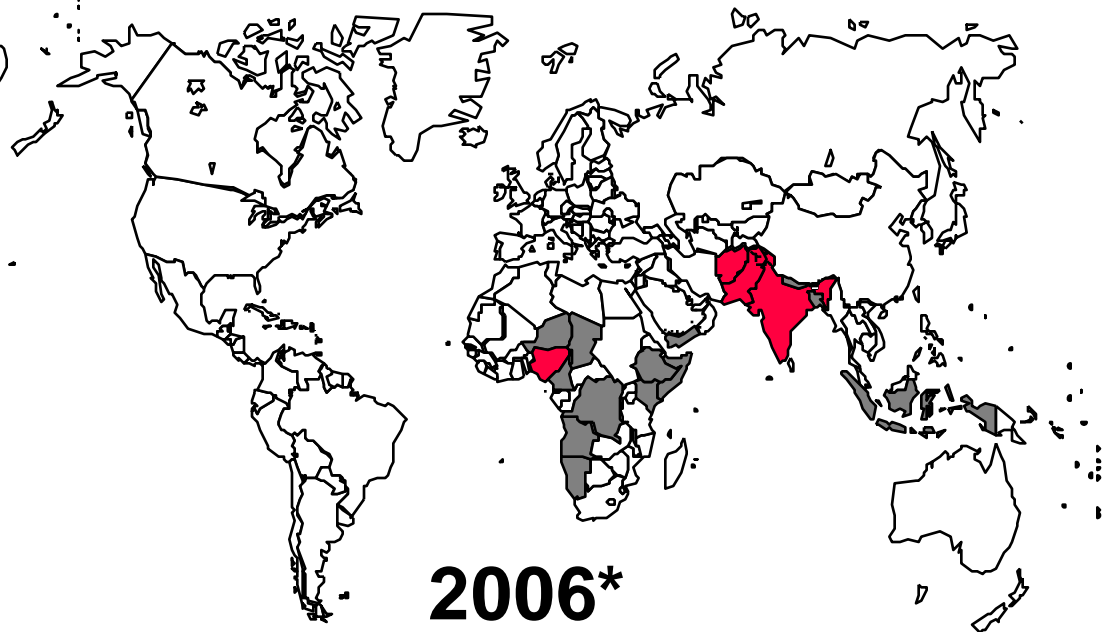


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# Progress and Challenges



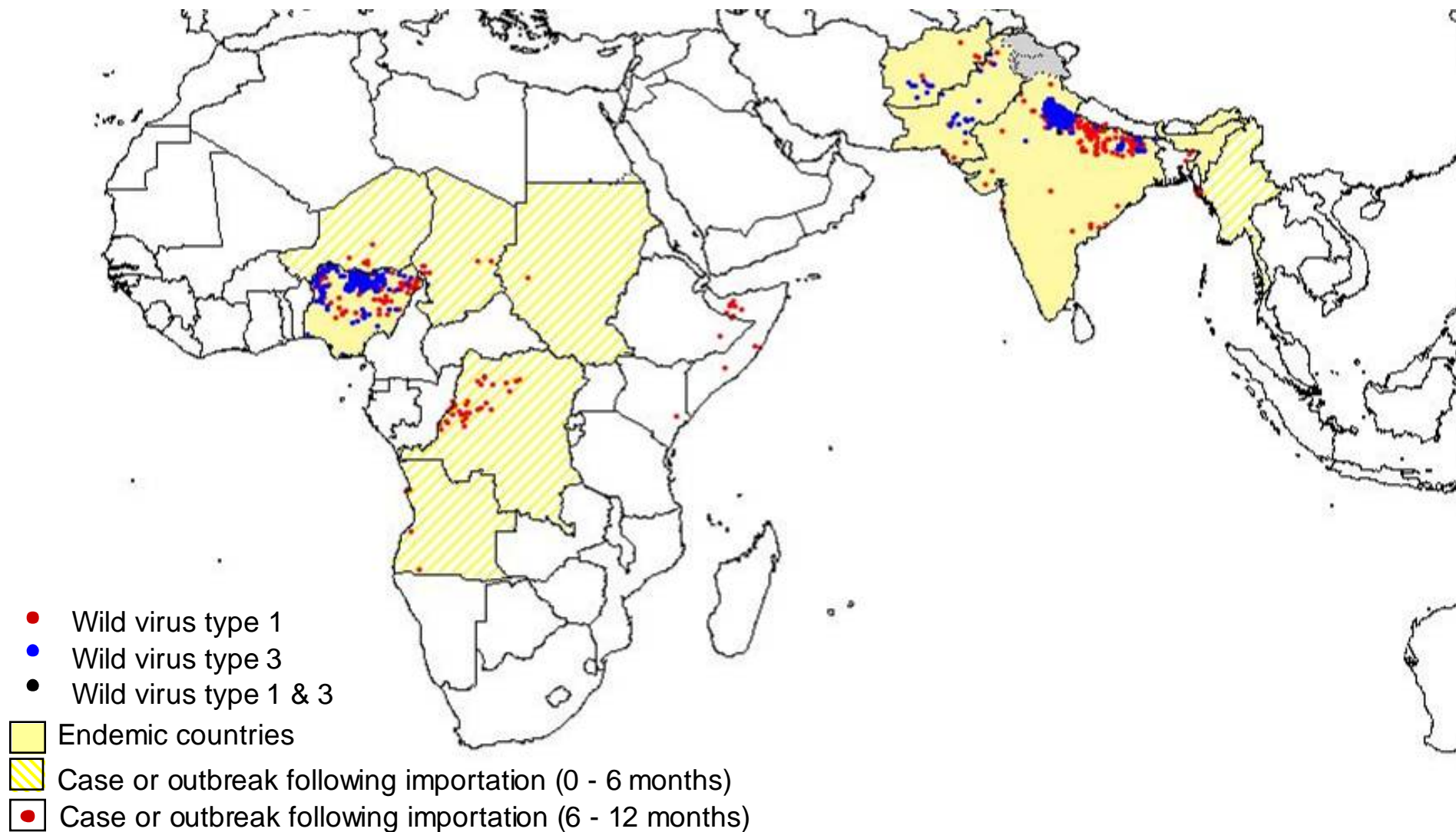
**125 endemic countries  
>350,000 cases**



**4 endemic countries; 13 re-infected countries;  
1,997 cases**

\*as of 23 Oct 2007

# Wild Poliovirus\*, 24 Oct 2006 - 23 Oct 2007

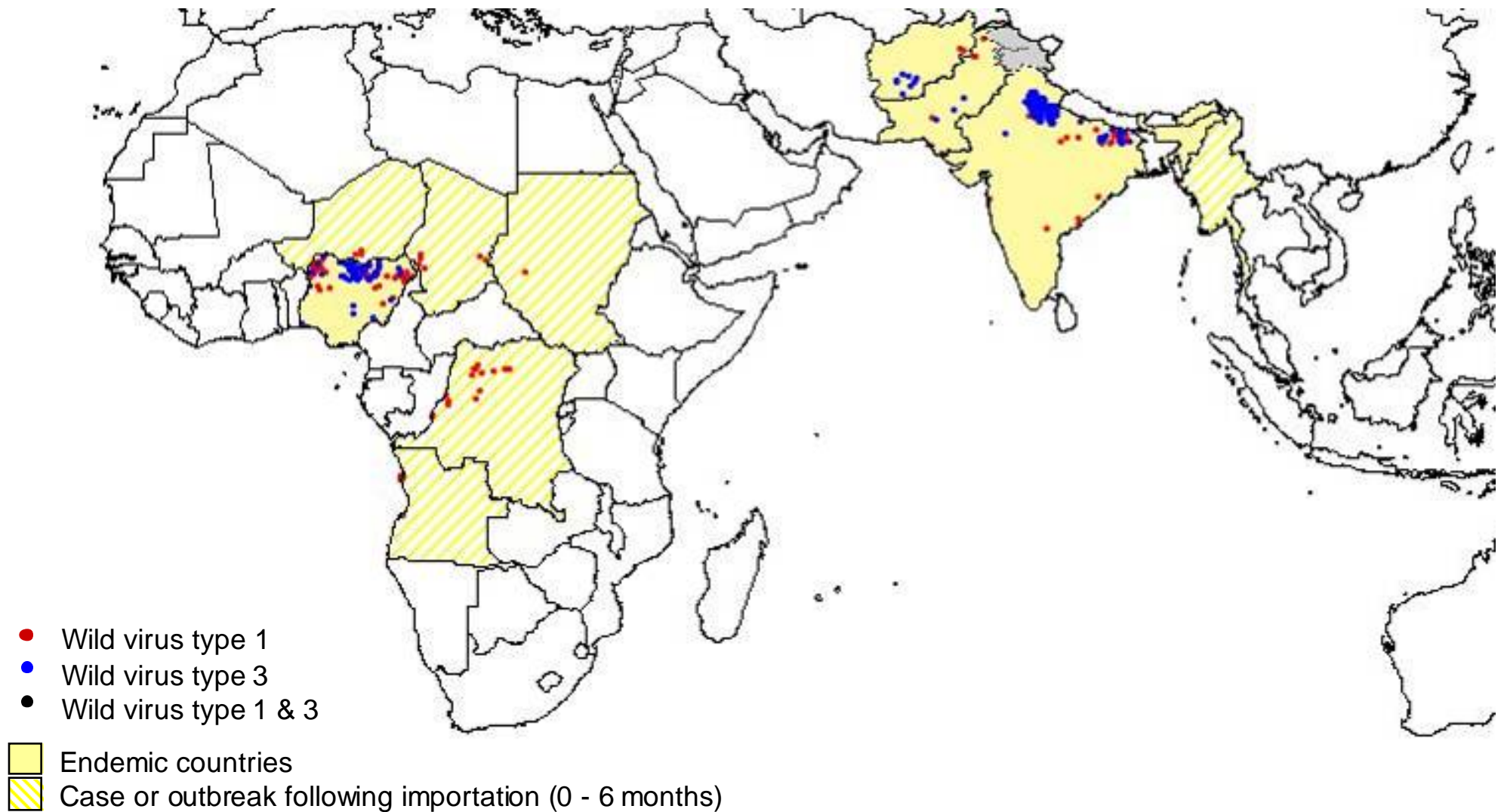


As of 01 January 2006, Egypt and Niger were reclassified as non-endemic countries.

\*Excludes viruses detected from environmental surveillance and vaccine derived polio viruses.  
Data in WHO HQ as of 23 Oct 2007

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.  
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# Wild Poliovirus\*, 24 Apr 2007 - 23 Oct 2007



\*Excludes viruses detected from environmental surveillance and vaccine derived polio viruses.

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# Overview

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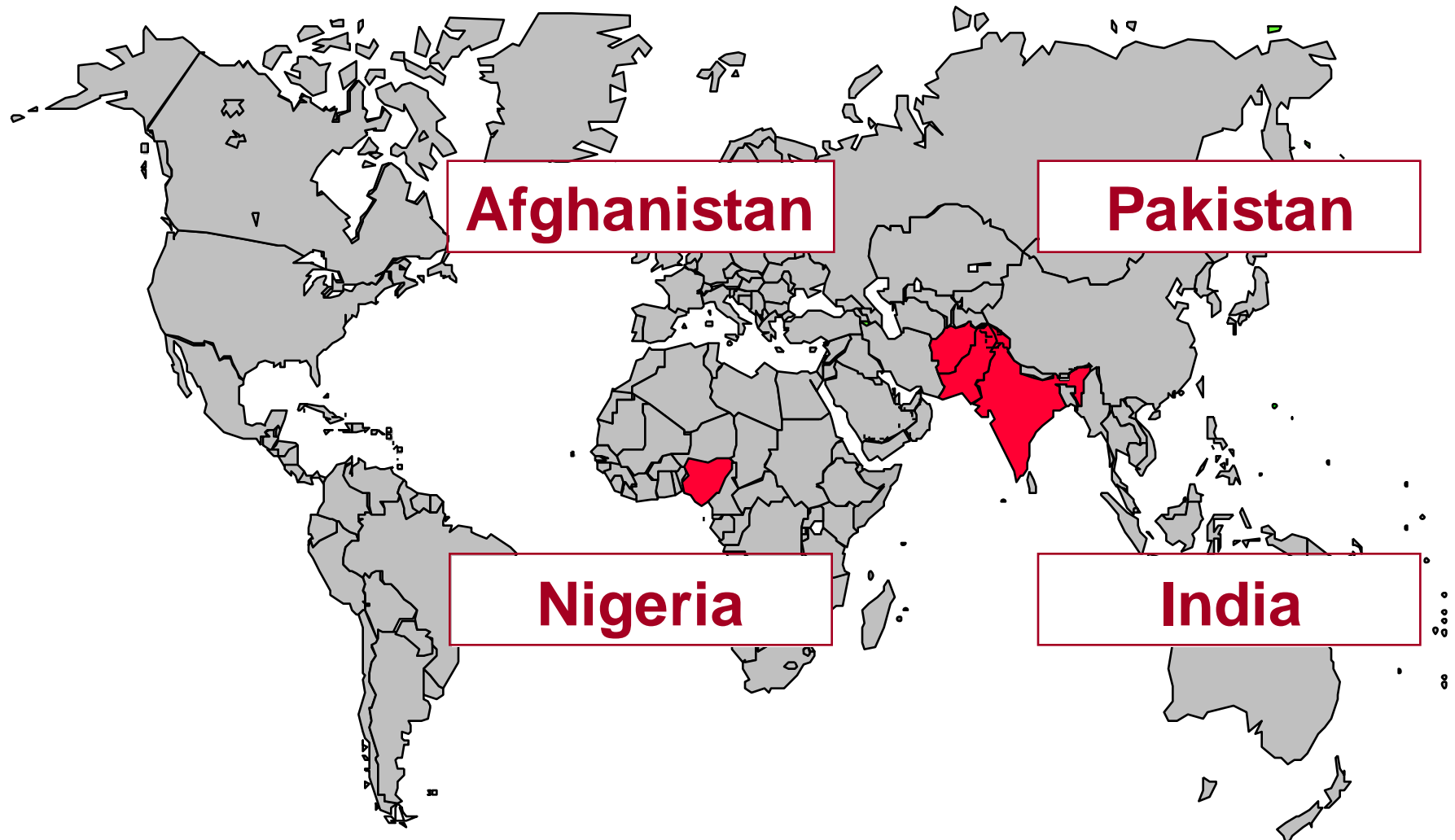
- *Stakeholders take stock*
- *Status and direction in polio-infected countries:*
  - *Four endemic*
  - *Reinfected*
- *Vaccine-derived poliovirus outbreaks*
- *Challenges after interruption of transmission*

# Stakeholder's conference Feb 2007

- *The 'Case for Completing Eradication': changing goal to control would cost more*
- *Commit to 2007-2008 Intensification*
- *New milestones set*
- *Intensified use of new tools & tactics*



# *Priority Focus: the 4 areas in 4 countries have never stopped polio*



# *Milestones 2007*

## Outcomes:

- endemic districts reduced by  $\geq 50\%$  compared to 2006.
- countries with imported virus in 2006 stop polio.

## Process:

- immunity among children 6-35 months in infected areas  $\geq$  that of polio-free areas of country\*.
- financing secured for all activities through mid-2008.

\* as measured in non-polio AFP cases aged 6-35 months &, accounting for differences in OPV efficacy.



# ***Intensified use of new tools & tactics***

# **New tools (2005-6) enhanced the eradication strategies**

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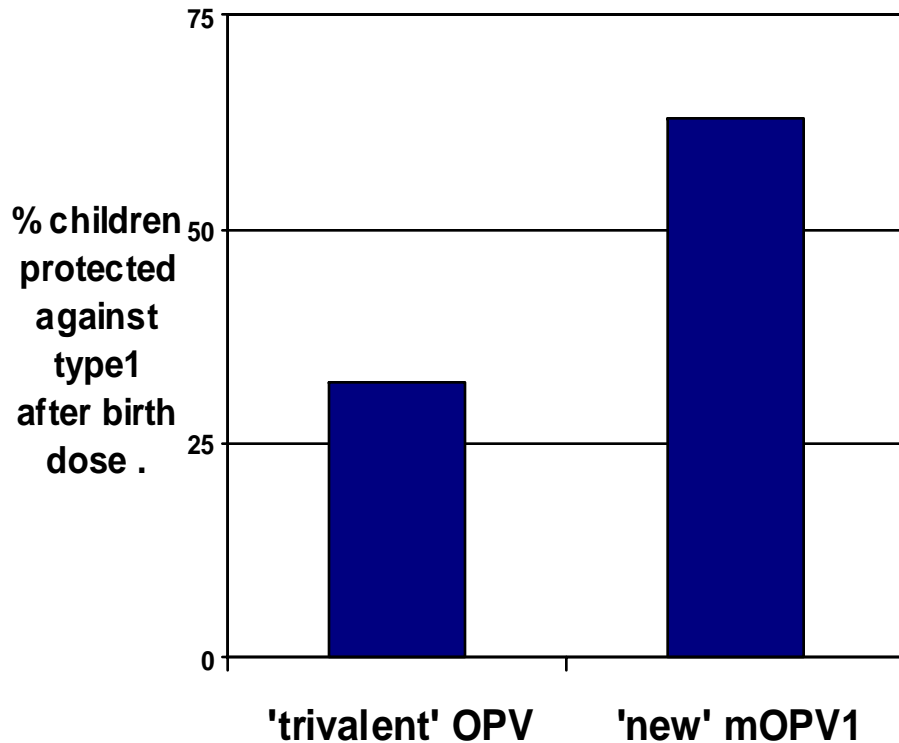
**New vaccines double the speed of protection**



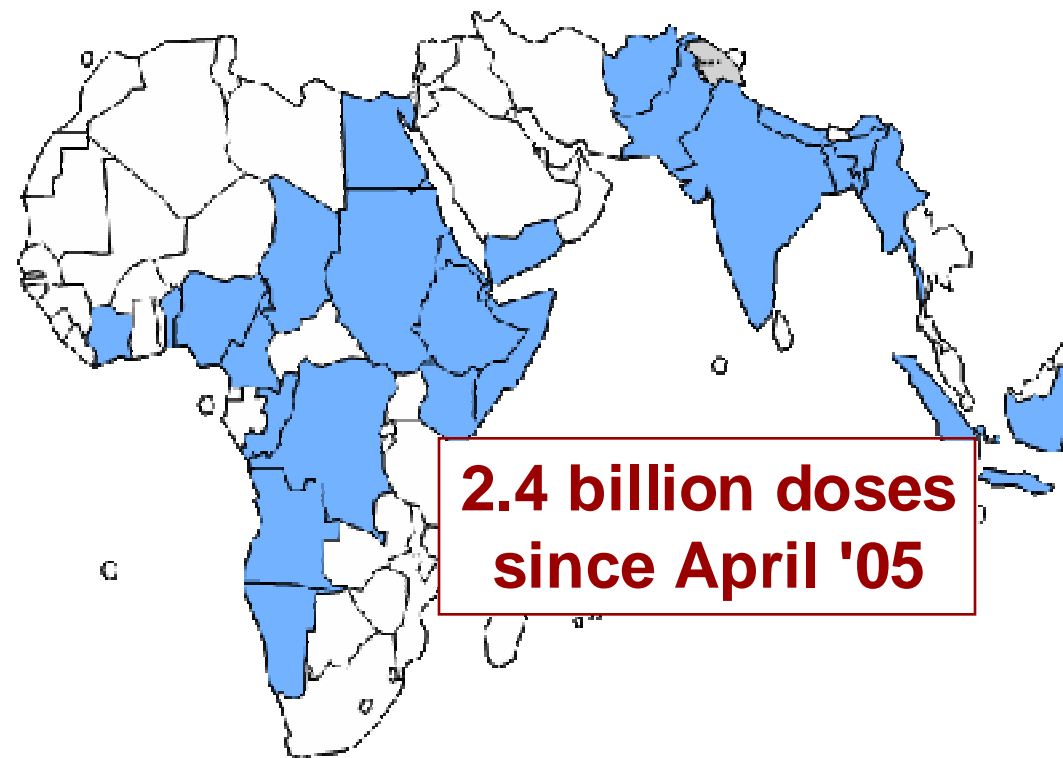
**New lab procedures cut by 50% time to confirm polio**

# Development & rapid scale-up of monovalent OPV type 1 (mOPV1)

mOPV1 clinical trial  
Egypt, 2006



Countries using mOPV1  
2006-2007 ( $N = 24$ )



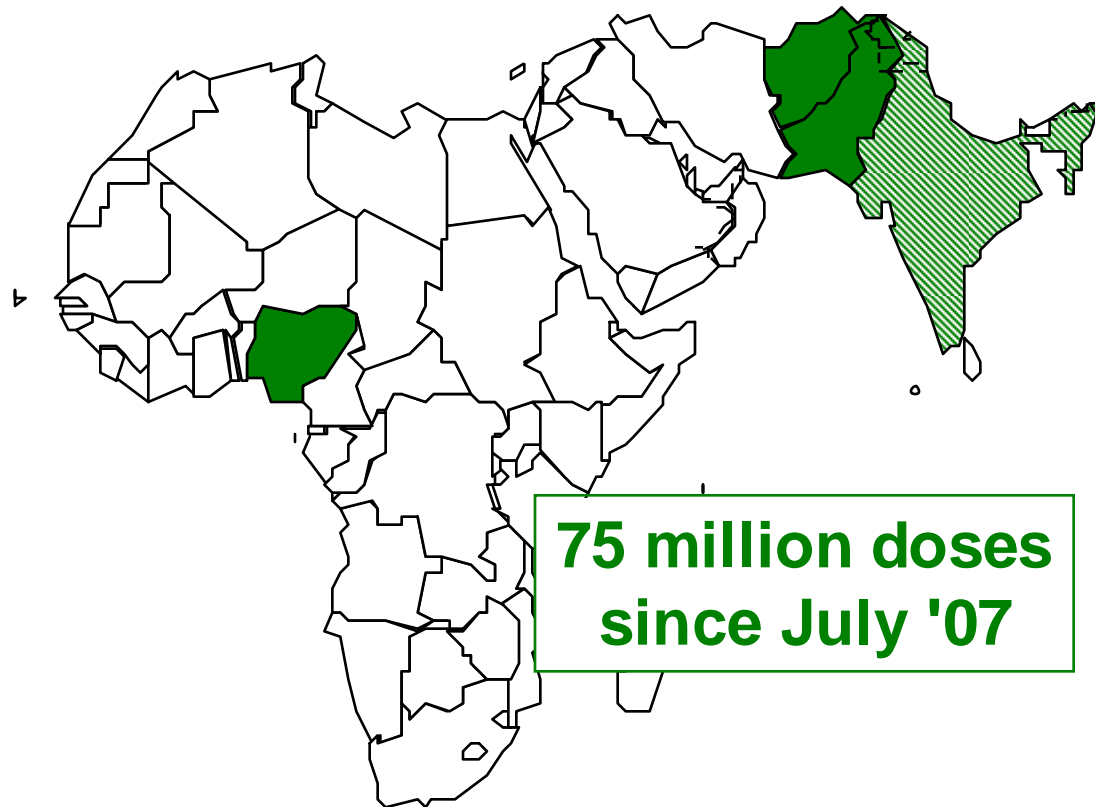
# Scale-up of monovalent OPV type 3

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## Countries using mOPV3



**mOPV3**



# New tactics (2006-7) address the specific challenges of each area



**Nigeria:** 'IPDs' or Immunization Plus Days since May 2006

**Pakistan/Afghanistan:** synchronized campaigns since Nov 2006



**India:** accelerated mOPV schedule since January 2007

# New tactics (2005-7) address community issues

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**Nigeria:** Community Dialogues  
Northern states  
since February 2006

**India:** Muslim Leader Conclave  
Uttar Pradesh  
Since March 2005



# New tactics (2006-7) reduce the risk of poliovirus importations



**New Outbreak  
Response Req'ts**



## THE TIMES OF INDIA

LUCKNOW: Saudi Arabia's king Abdullah Bin Abdul Aziz Al Saud might succeed where Bollywood icon Amitabh Bachchan has failed. A communication to the ministry of external affairs from Saudi monarch's Haj minister Al Farsi seeks assurance that all pilgrims from India are vaccinated against polio before boarding their flights for Mecca.

**Saudi Arabia  
now requires  
proof of OPV for  
entry visas.**



**New Recommendations on  
Polio Immunization & Travel**

# **New tactics for outbreak response** (wild or vaccine-derived poliovirus)

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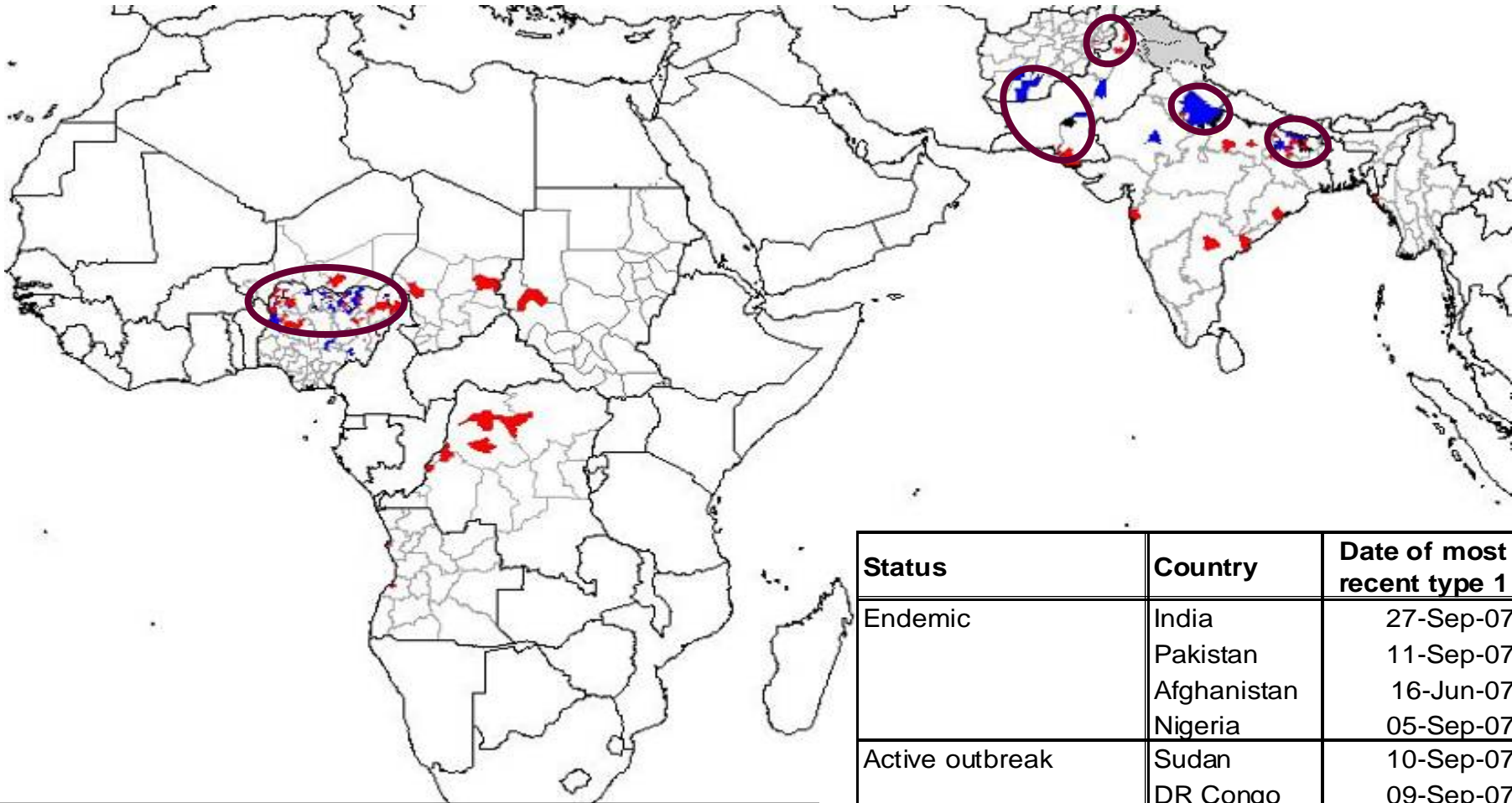
- **Plan within 72 hours & start in 4 weeks.**
- **Target 2-5 million children; house-to-house.**
- **Min 3 rounds & at least 2 rds after last case.**
- **Use mOPV1 or mOPV3 (unless 2 viruses).**
- **Achieve AFP > 2 at state/prov. for >12 months**

***World Health Assembly Resolution 59.1, May 2006***



***Polio-infected  
countries: Where do  
we go from here?  
- Endemic countries***

# Wild Poliovirus infected districts\*, 24 Apr 2007 - 23 Oct 2007



Status	Country	Date of most recent type 1	Date of most recent type 3
Endemic	India	27-Sep-07	28-Sep-07
	Pakistan	11-Sep-07	27-Sep-07
	Afghanistan	16-Jun-07	17-Sep-07
	Nigeria	05-Sep-07	01-Sep-07
Active outbreak	Sudan	10-Sep-07	NA
	DR Congo	09-Sep-07	NA
	Chad	31-Aug-07	NA
	Niger	18-Aug-07	NA
	Angola	08-Jul-07	NA
	Myanmar	28-May-07	NA

- district with wild polio virus type 1
- district with wild polio virus type 3
- area with 'indigenous' poliovirus

\*Excludes viruses detected from environmental surveillance and vaccine derived polio viruses.

Data in WHO HQ as of 23 Oct 2007

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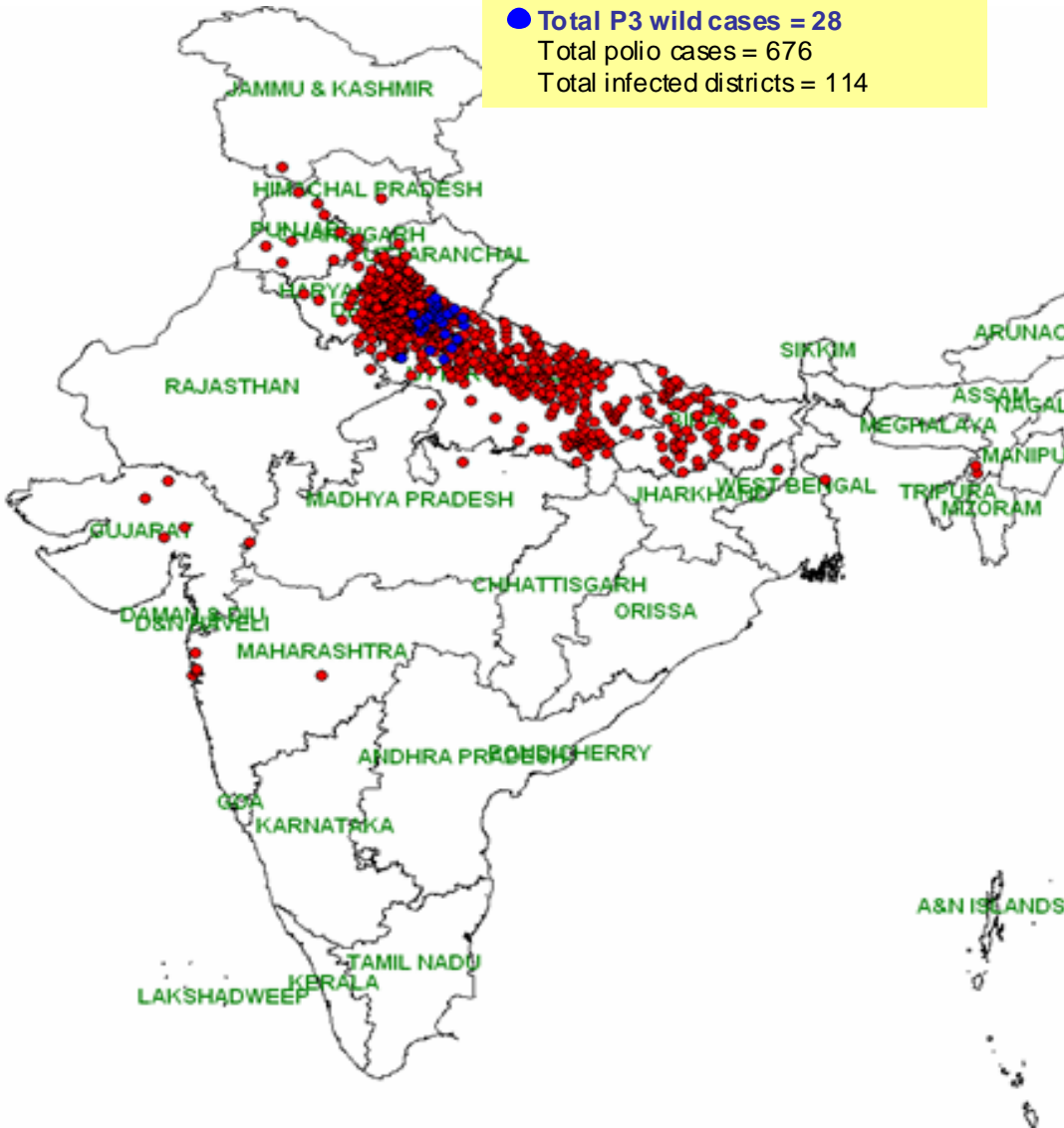
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# Confirmed Polio Cases

## India, 2006-2007

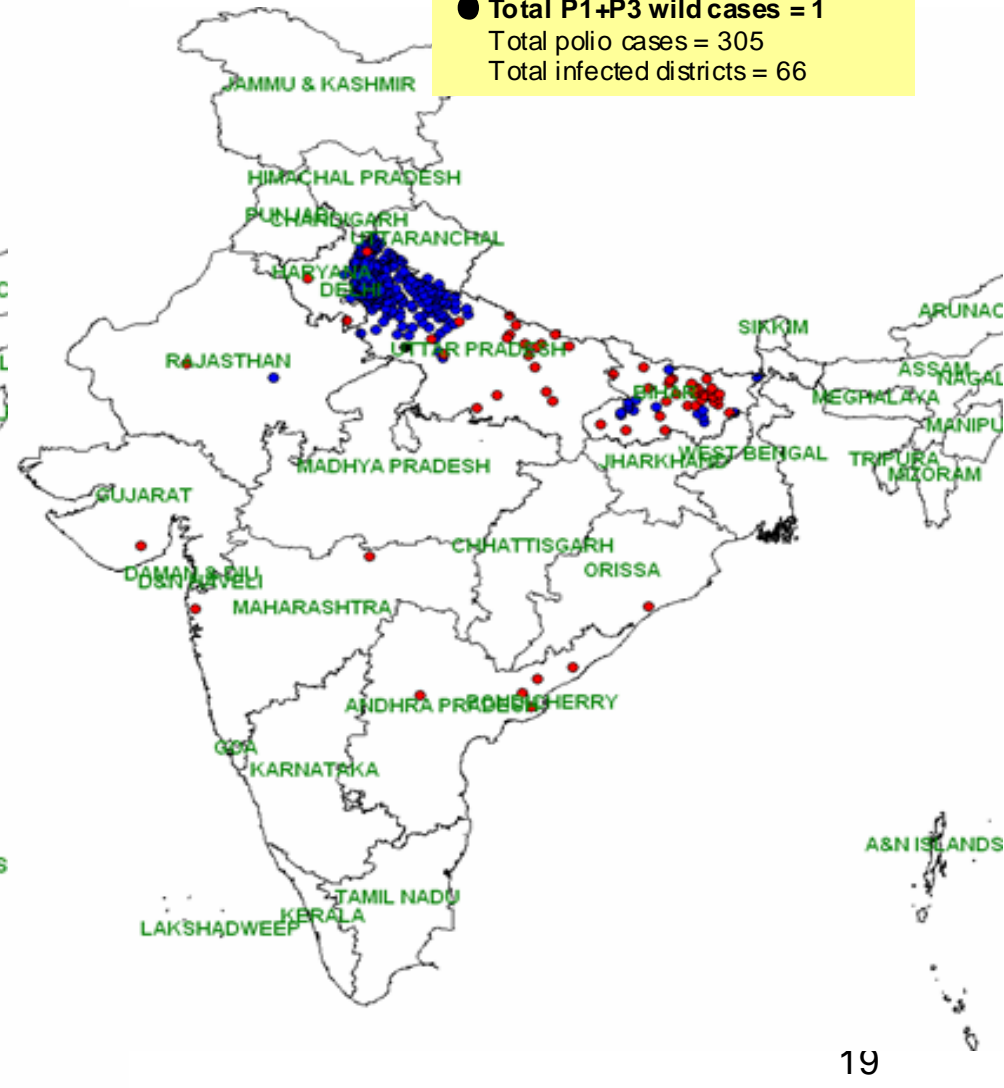
**2006**

- Total P1 wild cases = 648
- Total P3 wild cases = 28
- Total polio cases = 676
- Total infected districts = 114



**2007**

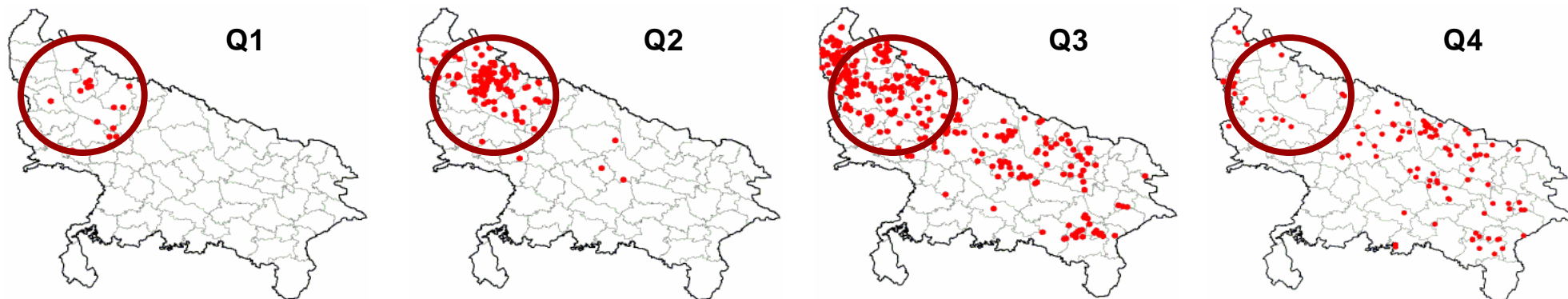
- Total P1 wild cases = 64
- Total P3 wild cases = 240
- Total P1+P3 wild cases = 1
- Total polio cases = 305
- Total infected districts = 66



# Impact on Type 1 Polio Cases

## Western Uttar Pradesh, India 2006-2007\*

**2006**



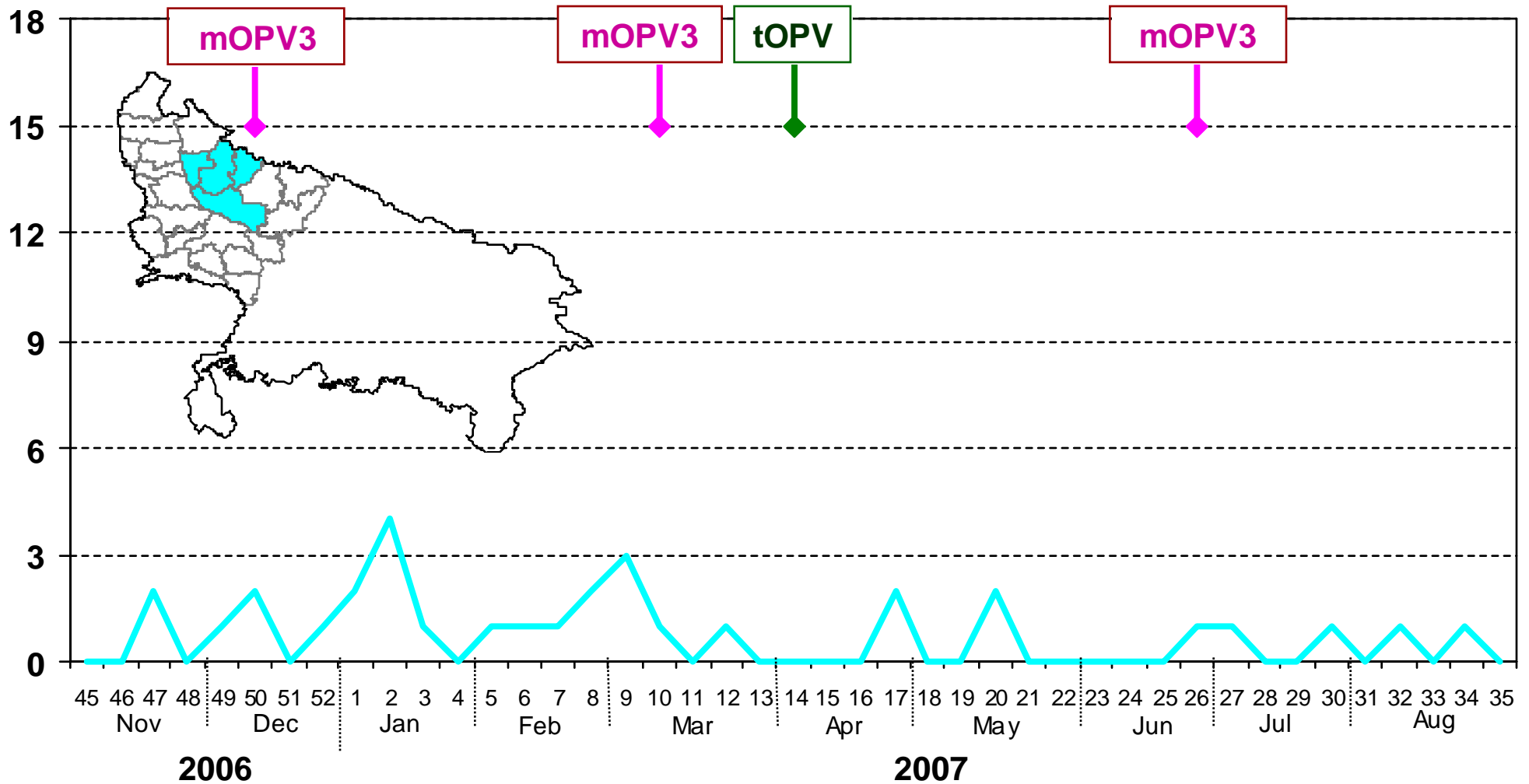
**2007**



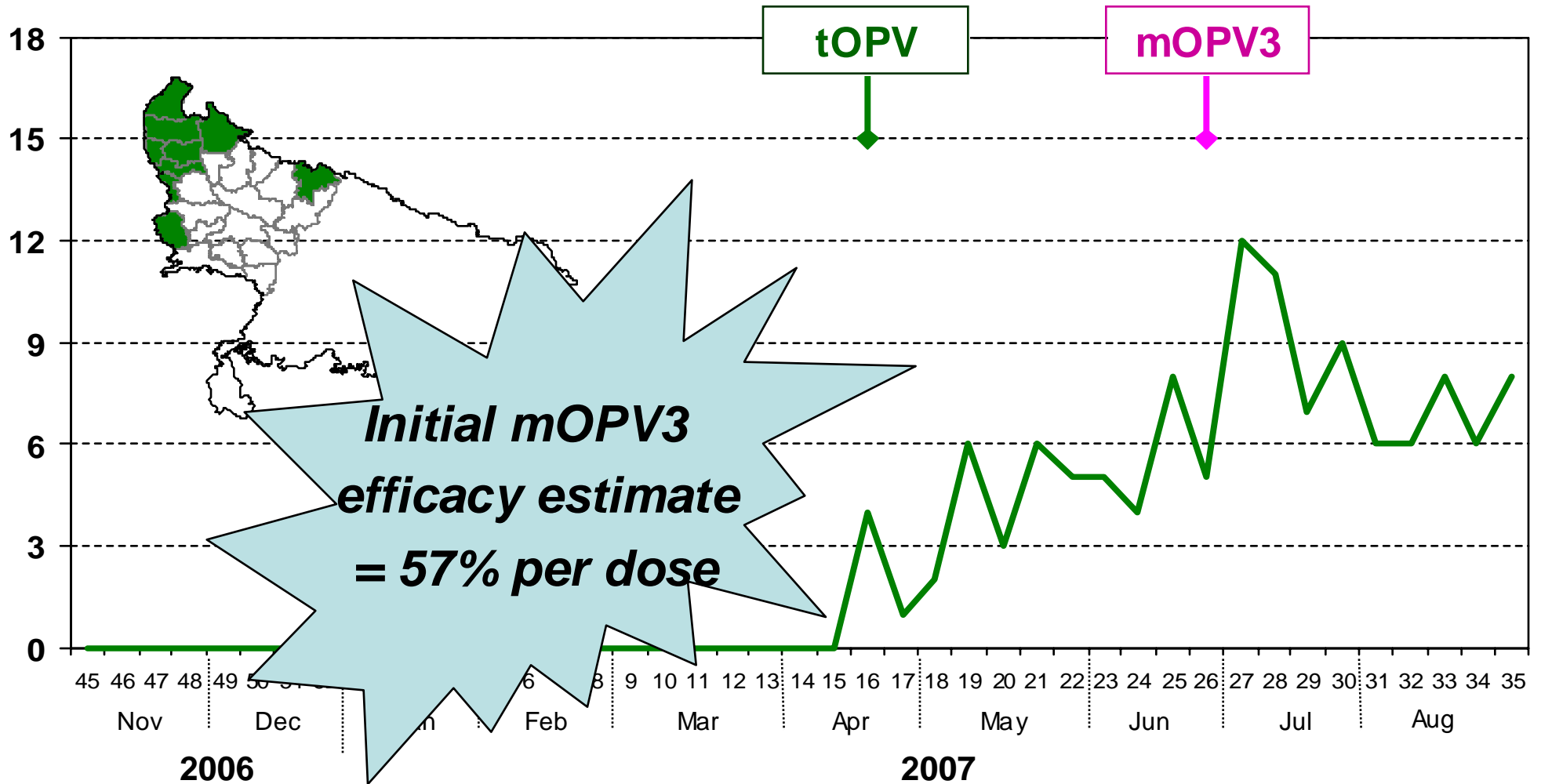
20

\* data as on 6<sup>th</sup> Oct 2007

# Initial impact of mOPV3 in type 3 epicentre in West UP, India

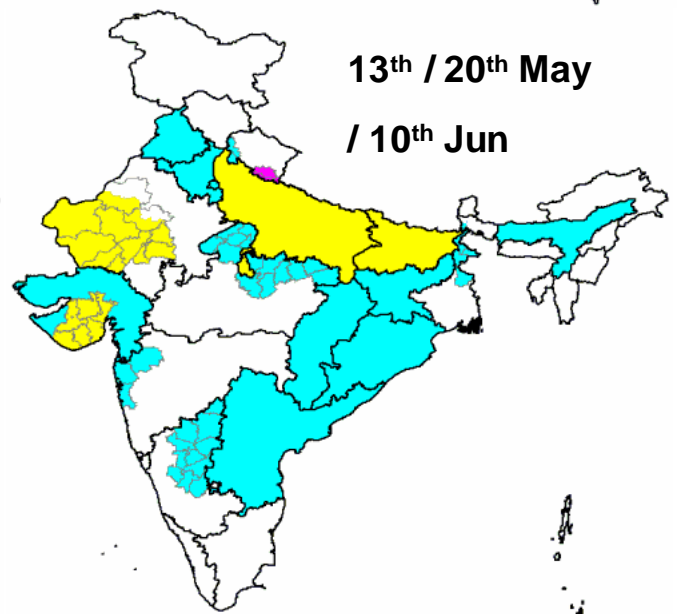
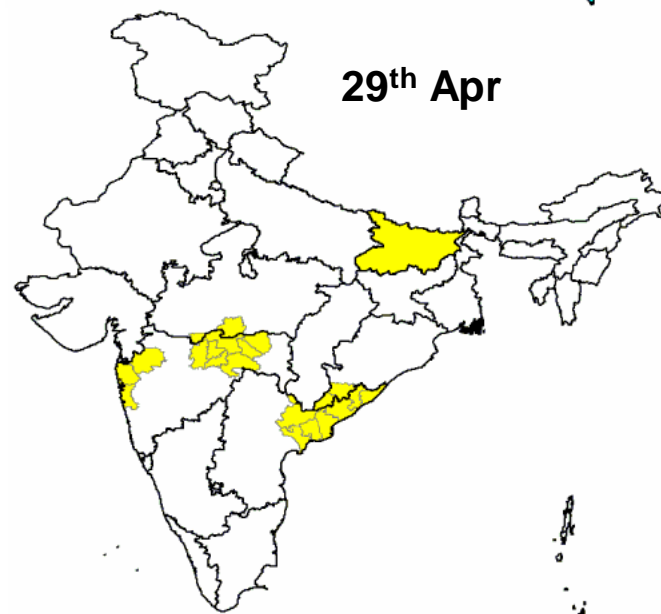
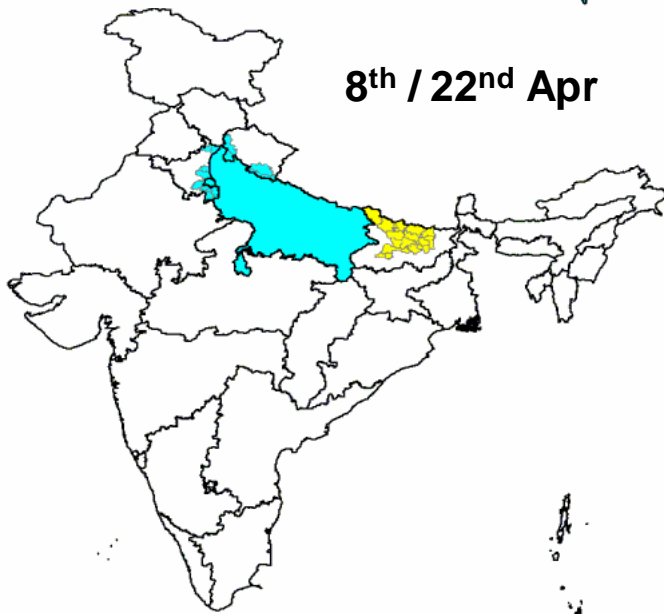
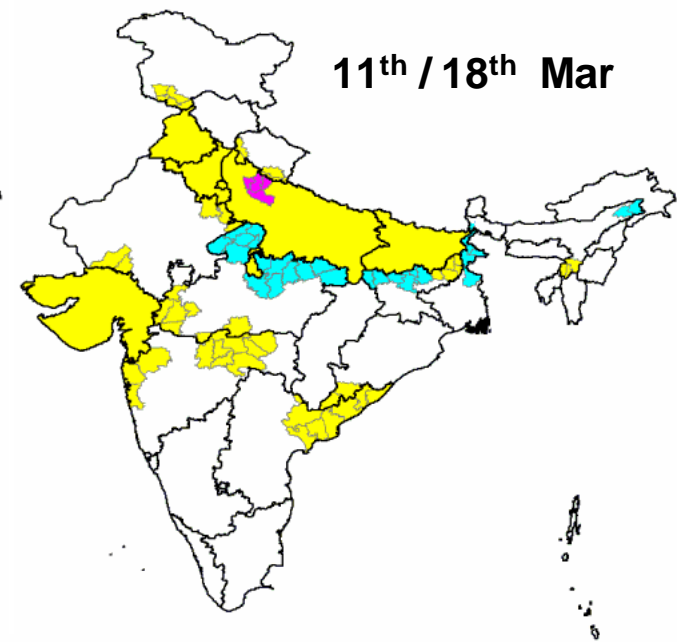
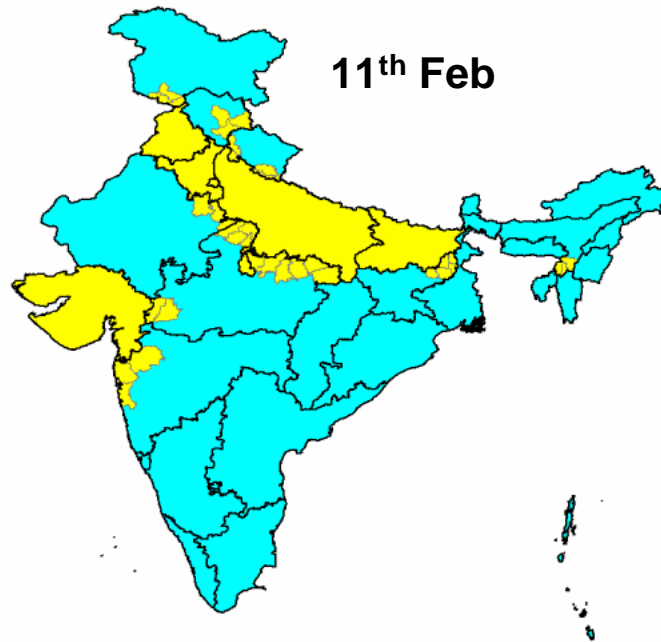
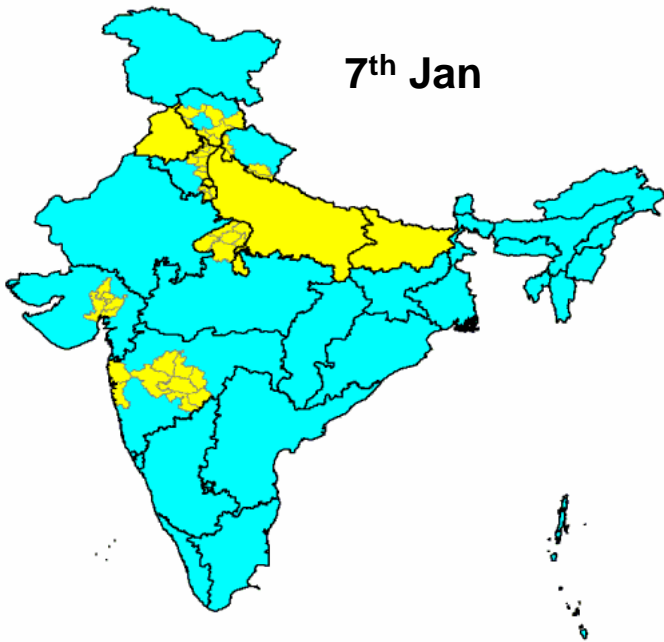


# Initial impact of mOPV3 in highest risk districts of West UP, India

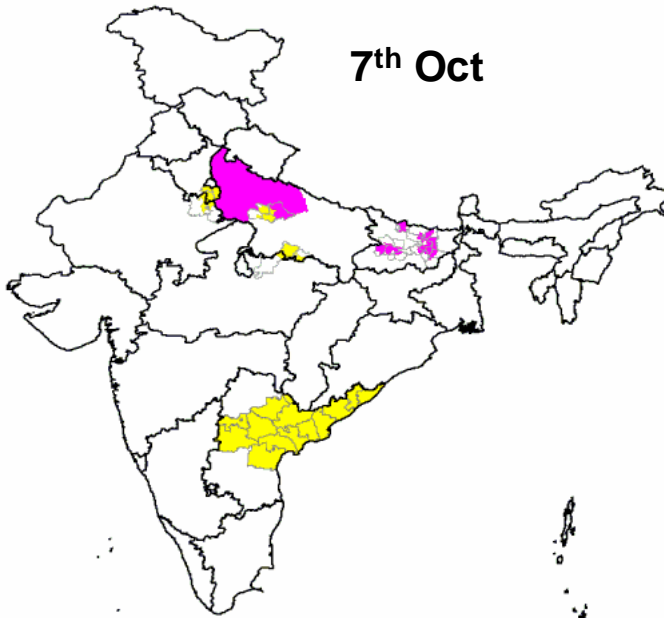
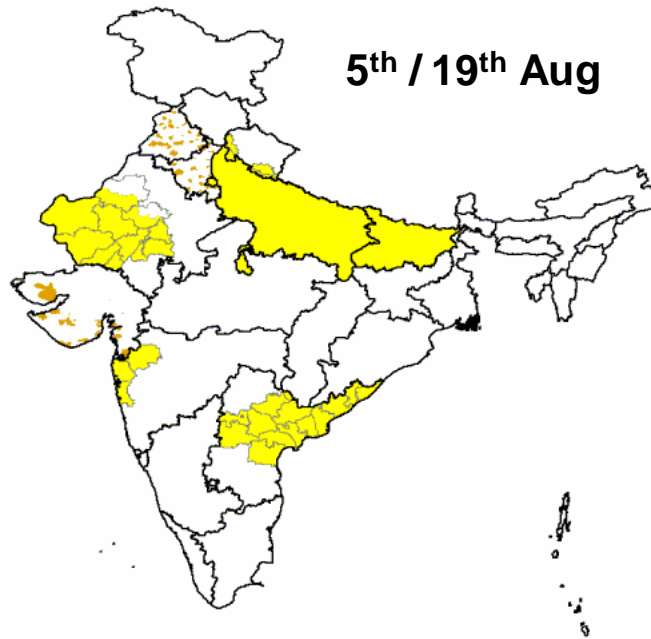
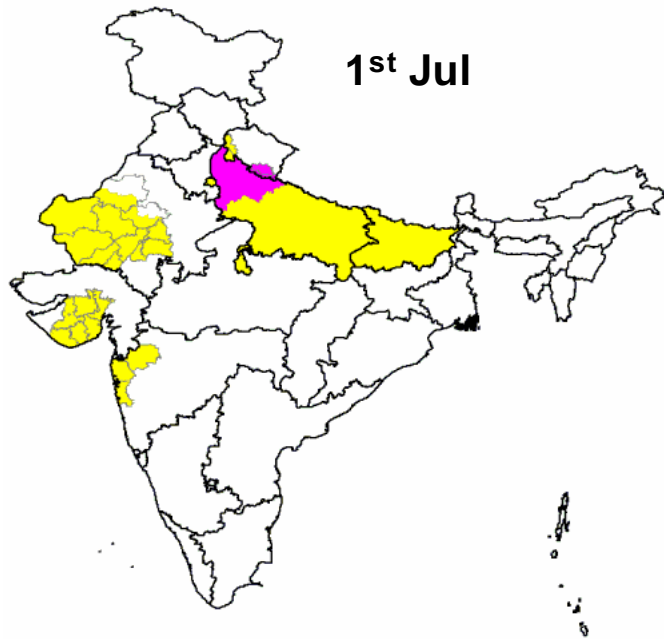


\* data as on 5<sup>th</sup> October 2007

# Polio Campaigns, India 2007 (1)



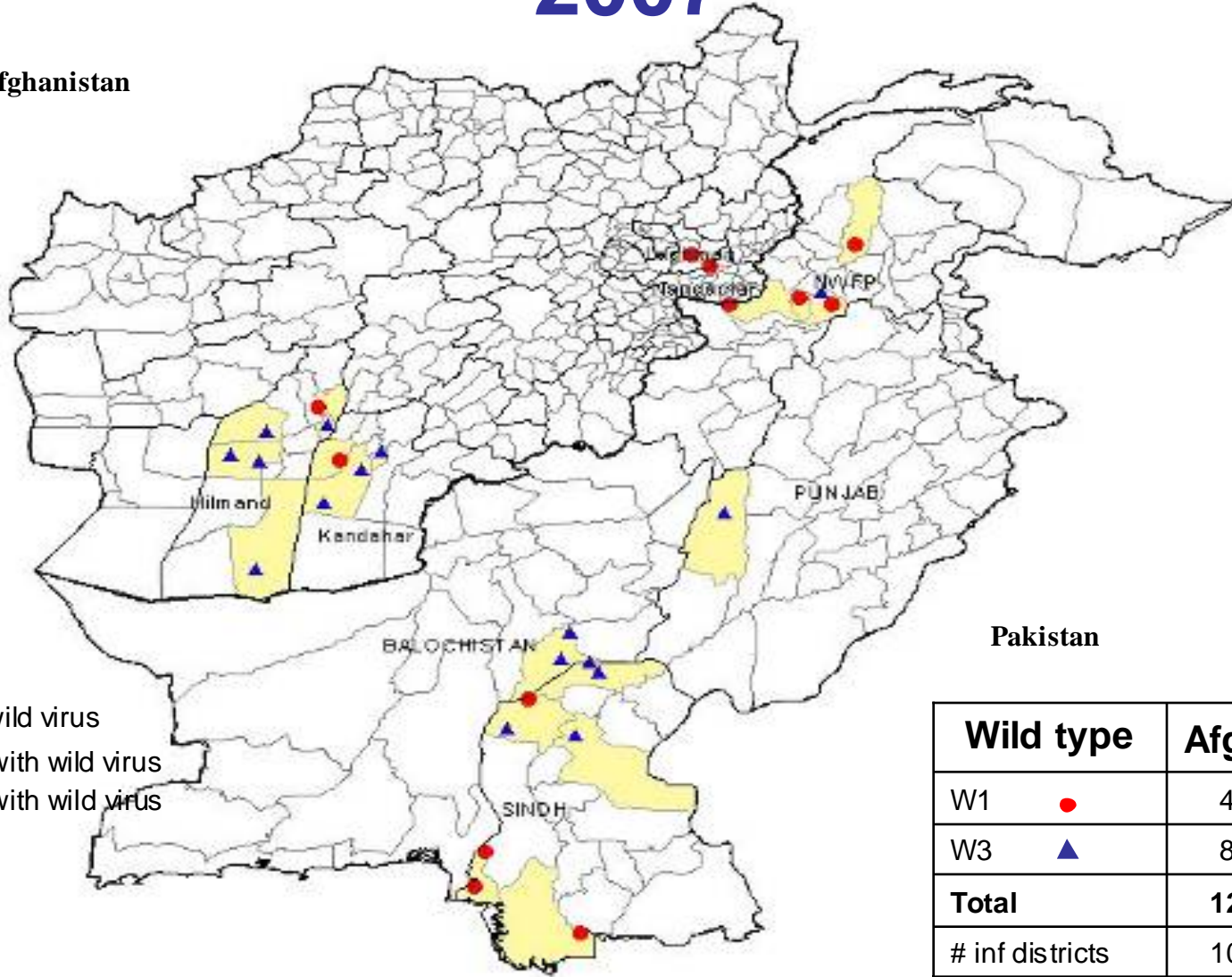
# Polio Campaigns, India 2007 (2)





# Afghanistan & Pakistan Wild Poliovirus, 2007

Afghanistan

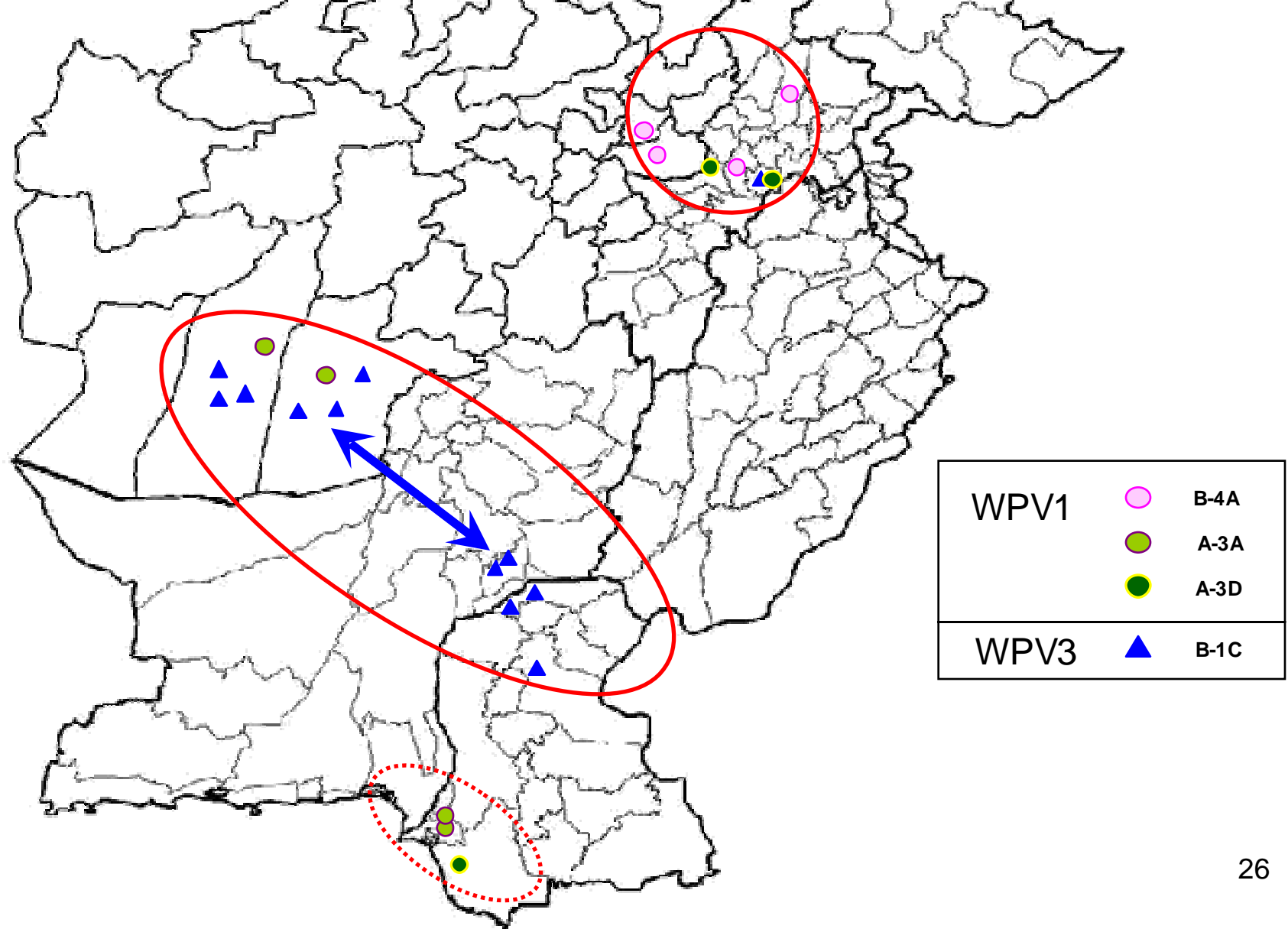


- District with wild virus
- New district with wild virus
- New district with wild virus

Pakistan

Wild type	Afg	Pak
W1 <span style="color: red;">●</span>	4	8
W3 <span style="color: blue;">▲</span>	8	8
<b>Total</b>	<b>12</b>	<b>16</b>
# inf districts	10	11

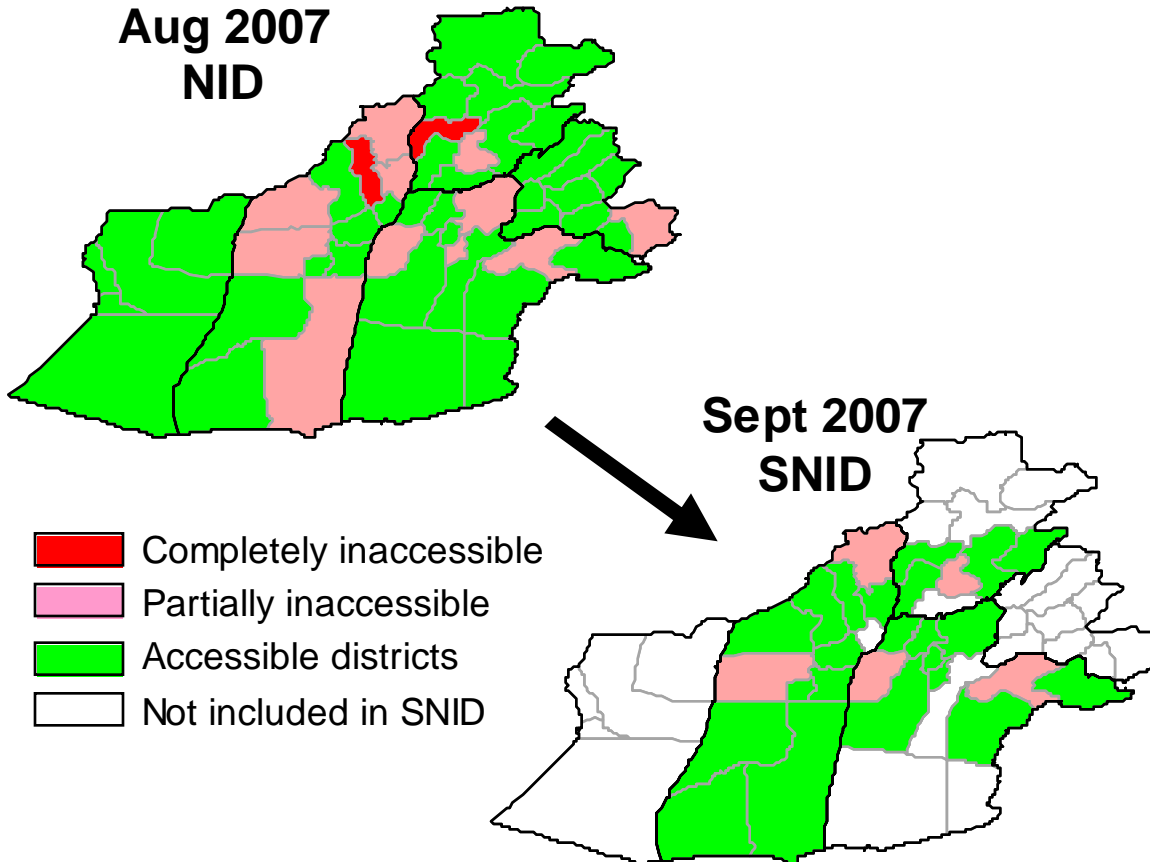
# WPV1 and WPV3 Cases by Genetic Cluster, Pakistan and Afghanistan, Jan-Sep 2007



# Enhanced Access to Children with Polio Vaccine

## Southern Region, Afghanistan

### Shura Letter of Support September 2007



د افغانستان اسلامي امارت او د طالبانو تحریک

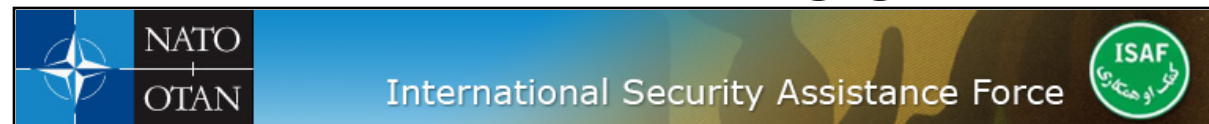
محترمو مجاهدینو او د اسلامي امارت اطباغو ته!

د (WHO) تقاضا او رسمي غوښتنې په اساس چې د گوزن مرض په ضد د واکسین د درې ورځني پروگرام د (UNICEF) په توسط د چلولو په هکله یې له اسلامي امارت څخه د امنیتي چارو د برابرولو غوښتنه کړې نو لېذا د اسلامي امارت ټولو مجاهدینو ته دا هدايت او توصیه کېږي چې ددغه روغتیايي پروگرام د کامیابه سرته رسولو لپاره د (UNICEF) له محلي کارمندانو سره په لاندې ځایونو او شروطو کې پوره پوره مرسته او همکاري ورسره وکړي تر څو د هیواد آینده نسل له دغه مهلک مرض څخه وژغورل شي.

- ځایونه: کندهار، هلمند، ارزگان، زابل، فراه، او همدارنگه تنگرهار، کپړ او لغمان
- د پروگرام د چلولو تاریخ: ۲۸، ۲۹، ۳۰ د وږي د میاشتې چې د میلادی کال د سپتمبر د میاشتې له ۱۹، ۲۰، ۲۱ تاریخ سره سمون خوري
- په پروگرام کې به ځایي کارمندان کار کوي او ټاکلي ځای لکه کلینیک، مکتب یا د کوم قومي مشر په کور کې به ترسره کېږي او ټول ماشومان به هلته ورته راوستل کېږي

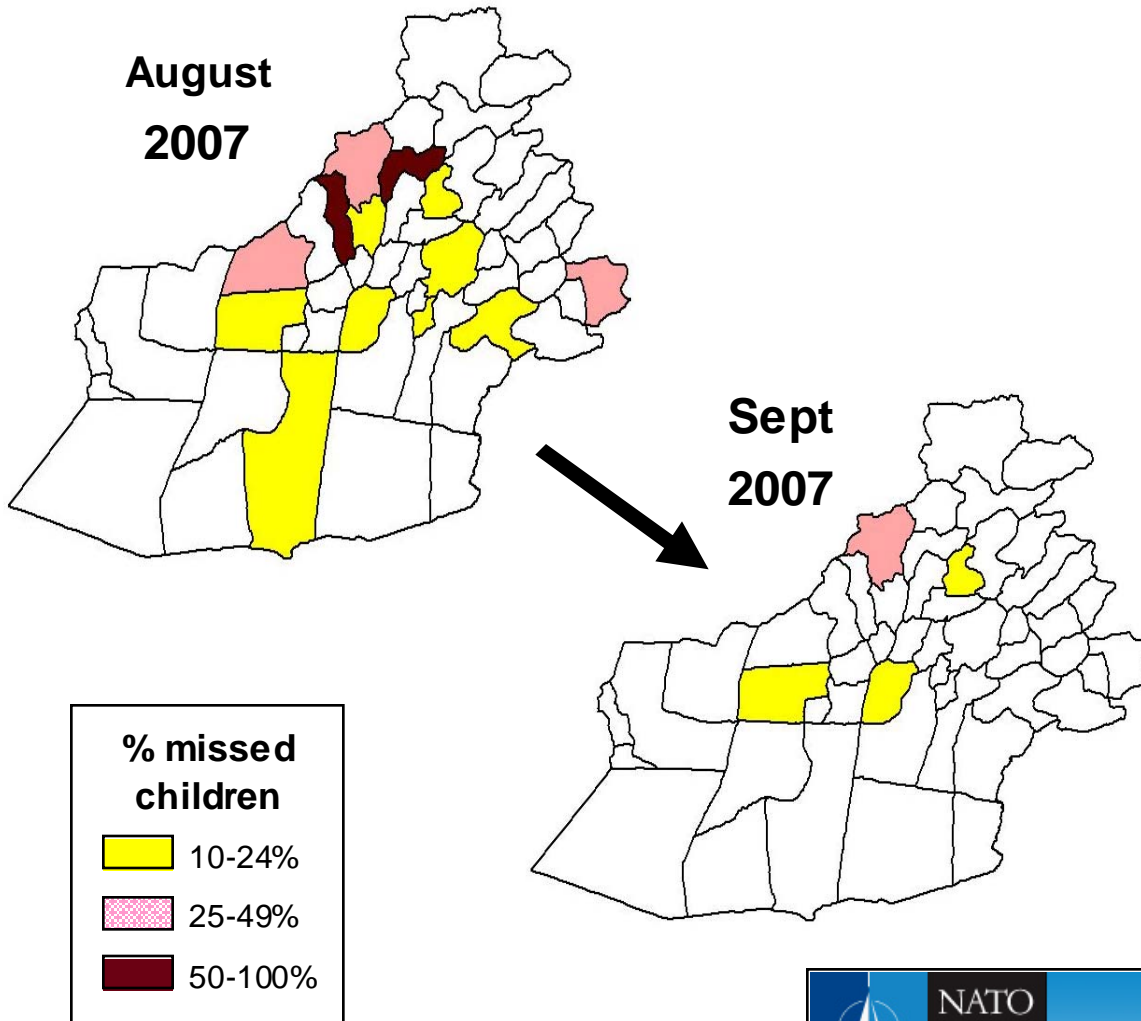
د افغانستان د اسلامي امارت او  
طالبانو د تحریک د مشرتابه له لوري،

**Increased engagement, ISAF**



# Enhanced Access to Children with OPV

## Southern Region, Afghanistan



### Shura Letter of Support September 2007

د افغانستان اسلامي امارت او د طالبانو تحریک

محترمو مجاهدينو او د اسلامي امارت اطباغو ته!  
 د (WHO) تقاضا او رسمي غوښتنې په اساس چې د گوزنې مرض په ضد د واکسين د درې ورځني پروگرام د (UNICEF) په توسط د چلولو په هکله يې له اسلامي امارت څخه د امنيتي چارو د برابرولو غوښتنه کړې نو لهدا د اسلامي امارت ټولو مجاهدينو ته دا هدايت او توصيه کيږي چې د دغه روغتيايي پروگرام د کاميابه سرته رسولو لپاره د (UNICEF) له محلي کارمندانو سره په لاندې ځايونو او شروطو کې پوره مرسته او همکاري ورسره وکړي تر څو د هيواد آينده نسل له دغه مهلک مرض څخه وژغورل شي.

- ځايونه: کندهار، هلمند، ارزگان، زابل، فراه، او همدارنگه ننگرهار، کټ او لغمان
- د پروگرام د چلولو تاريخ: ۳۰، ۲۹، ۲۸ د وږي د مياشتې چې د ميلادي کال د سپتمبر د مياشتې له ۲۰، ۱۹، ۲۱ تاريخ سره سمون خوري

- په پروگرام کې به ځايي کارمندان کار کوي او ټاکلي ځای لکه کلينیک، مکتب يا د کوم قومي مشر په کور کې به ترسره کيږي او ټول ماشومان به هلته ورته راوستل کيږي

د افغانستان د اسلامي امارت او  
 طالبانو د تحریک د مشرتابه له لوري،

Increased engagement, ISAF



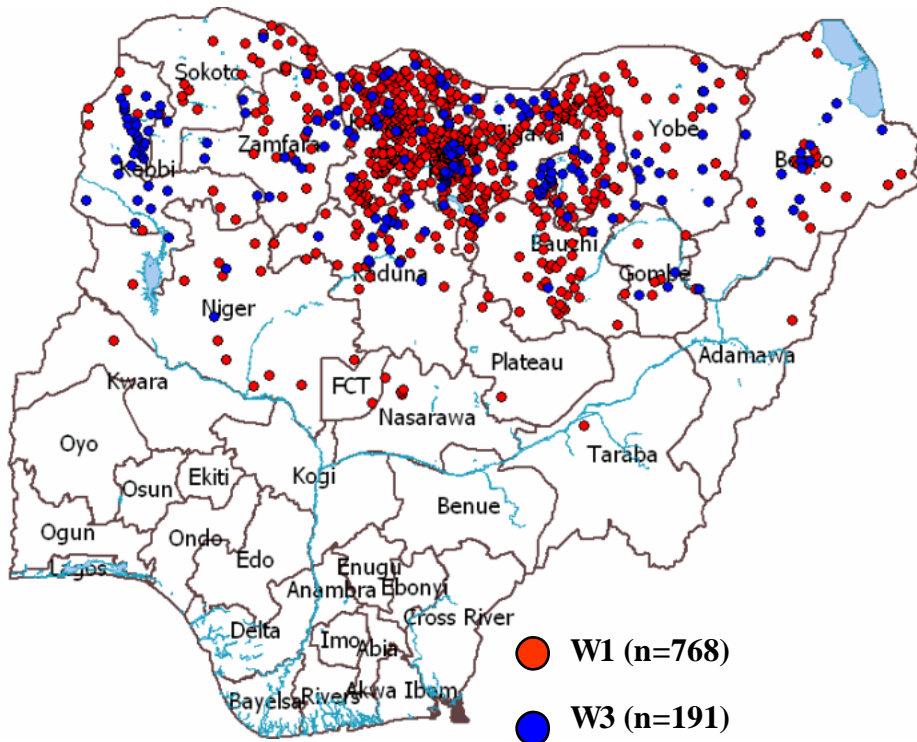
International Security Assistance Force



# Nigeria Wild poliovirus, 2006 – 2007

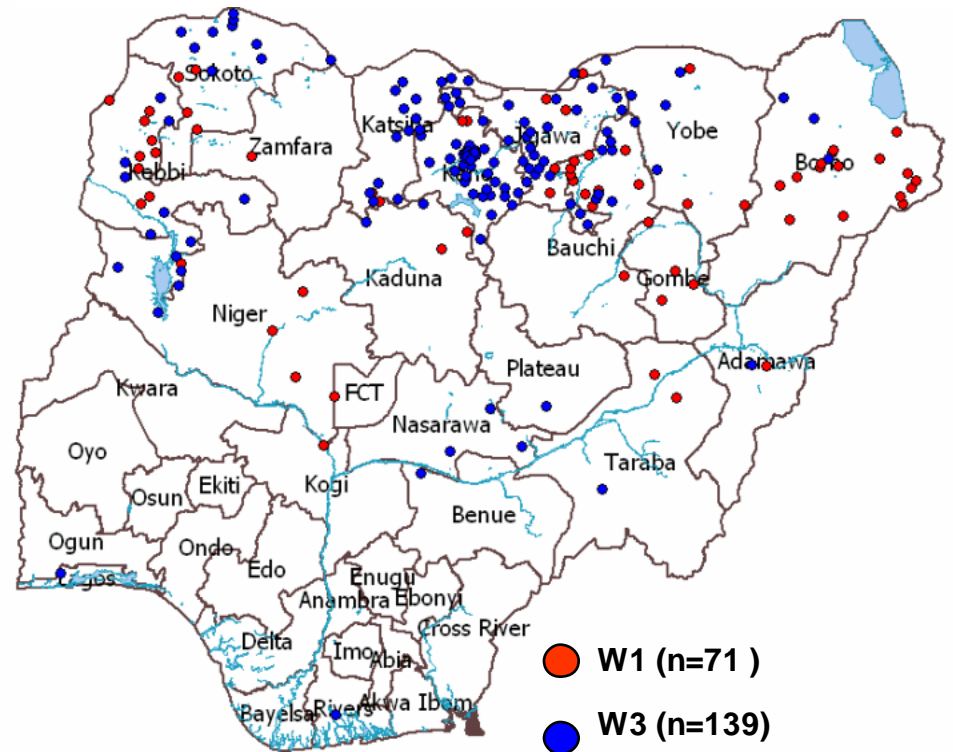
through Onset Sep 5, 2006/2007

2006



2007

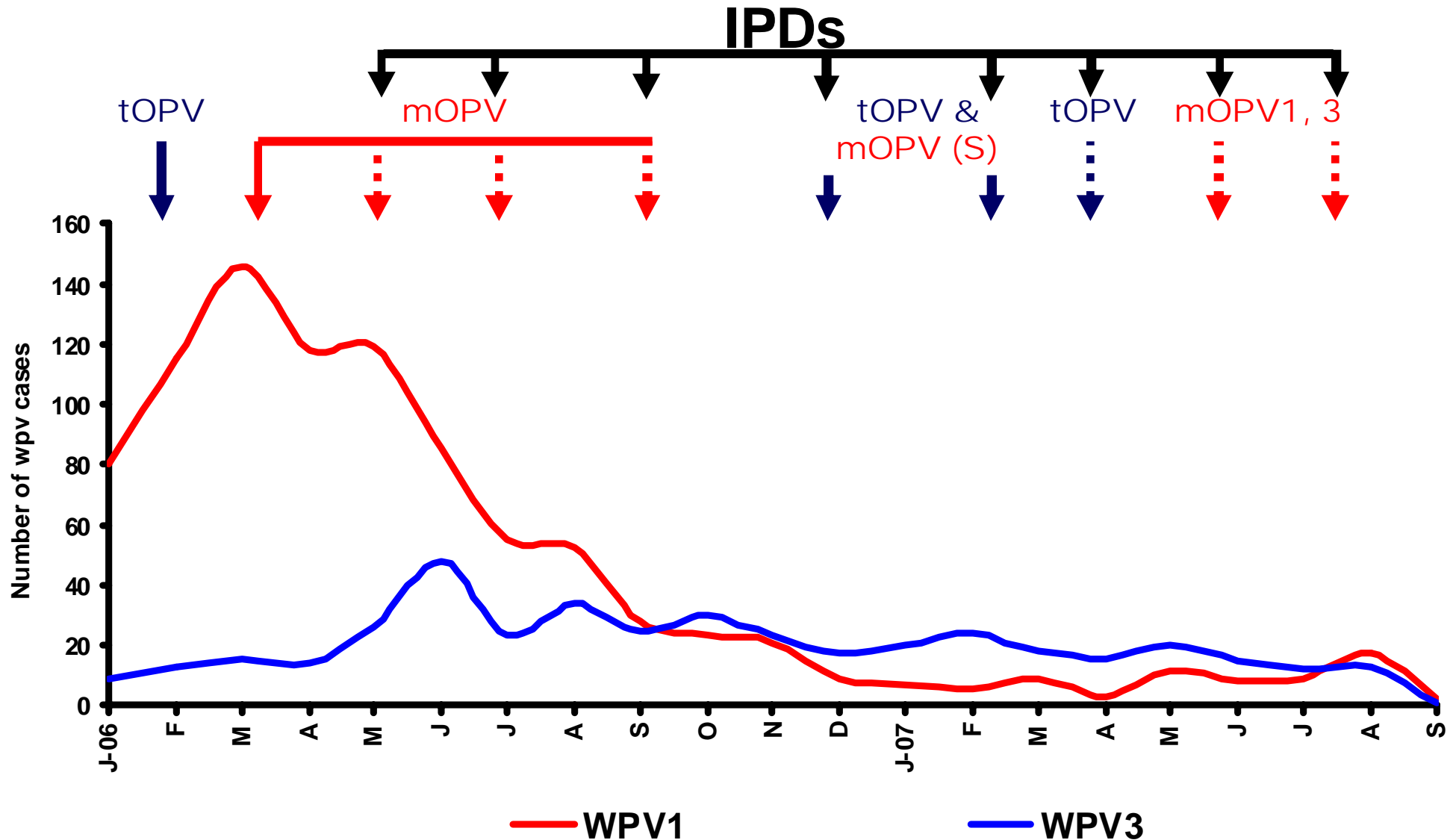
Data as of October 20



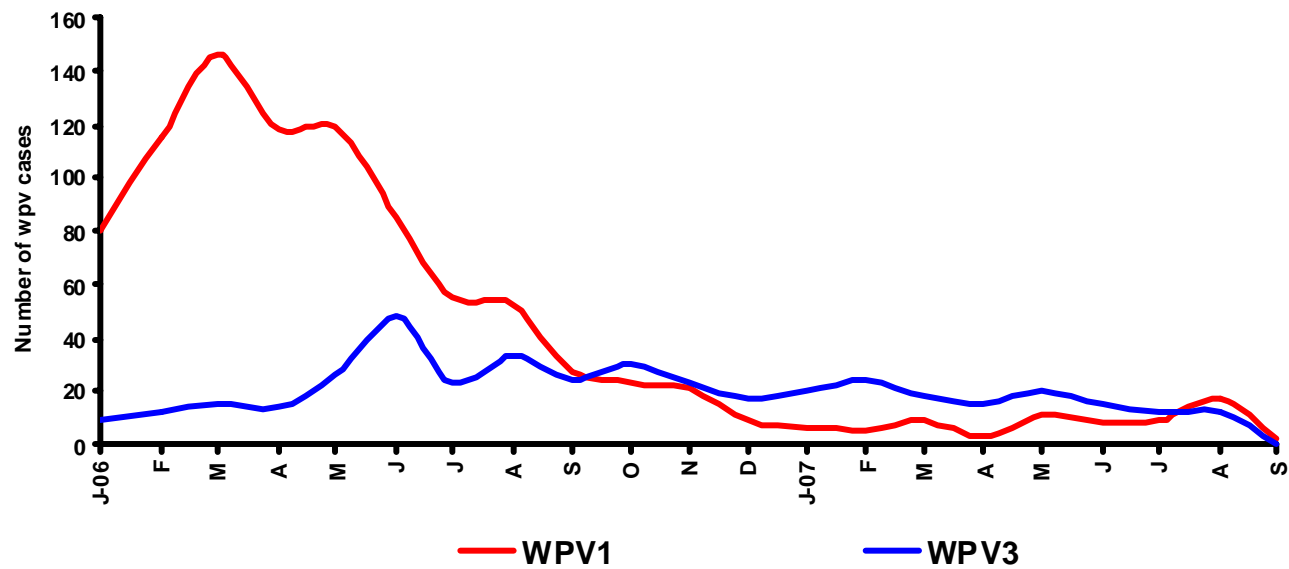
\* Onset of most recent case on 5-Sep-2006

\* Onset of most recent case on 5-Sep-2007

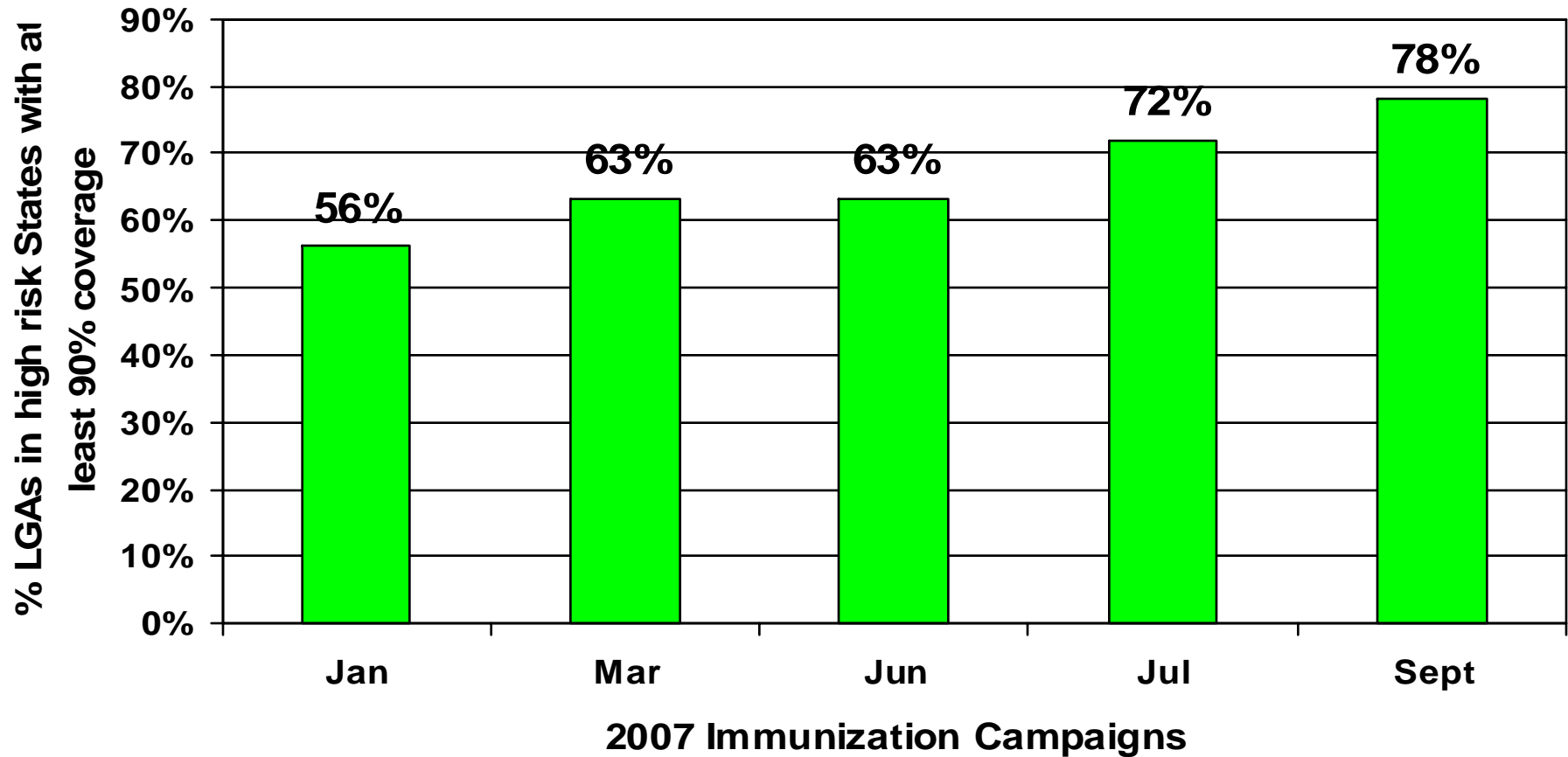
# New Tools & Tactics: impact in Nigeria\*



\*data as of 20 October 2007

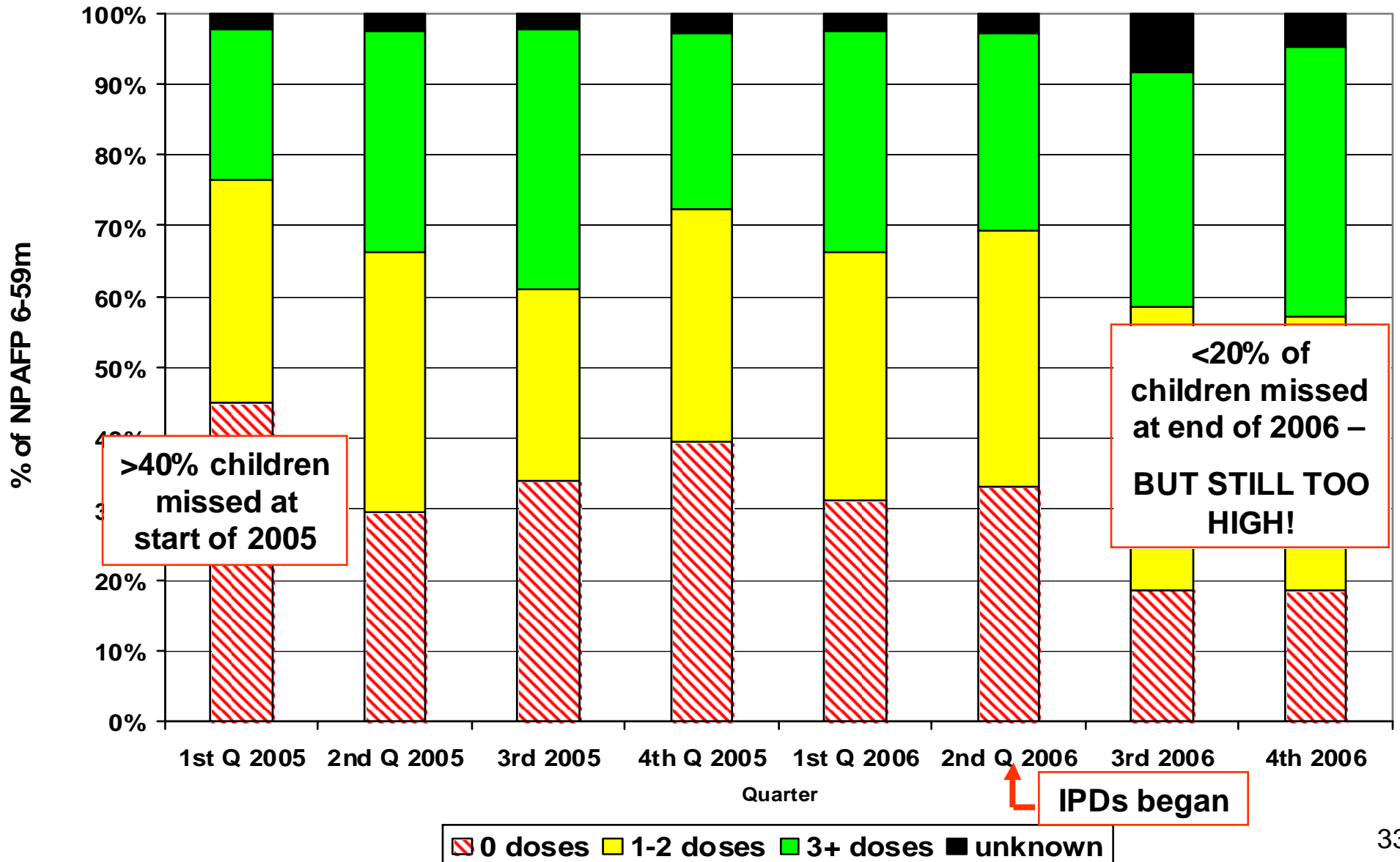


# Improving SIA Quality in Polio High-risk states





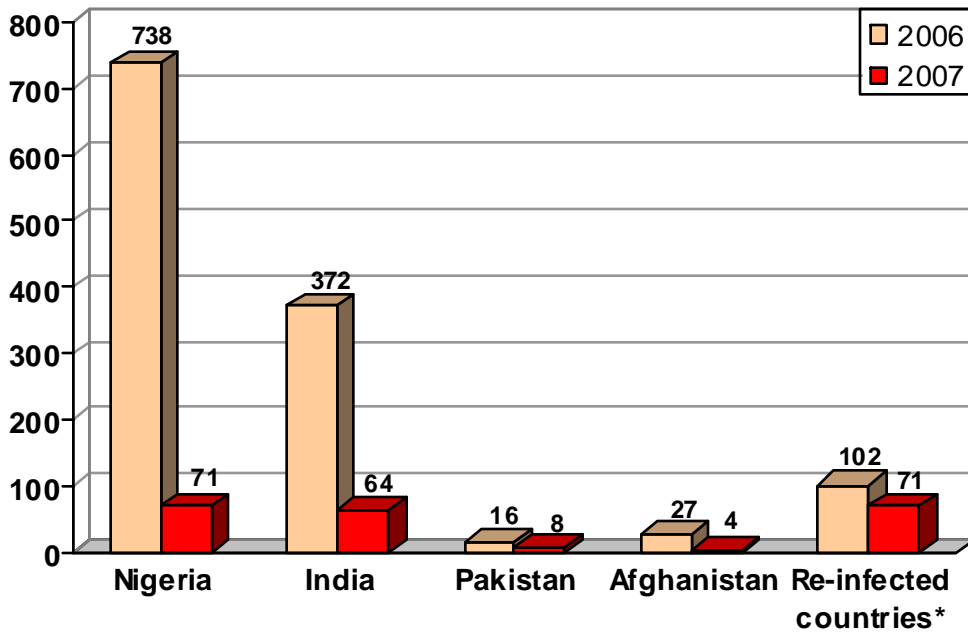
# Vaccination status in NPAFP aged 6-59 months, by quarter for 10 high incidence states,\* Nigeria 1<sup>st</sup> quarter 2005-4<sup>th</sup> quarter 2006



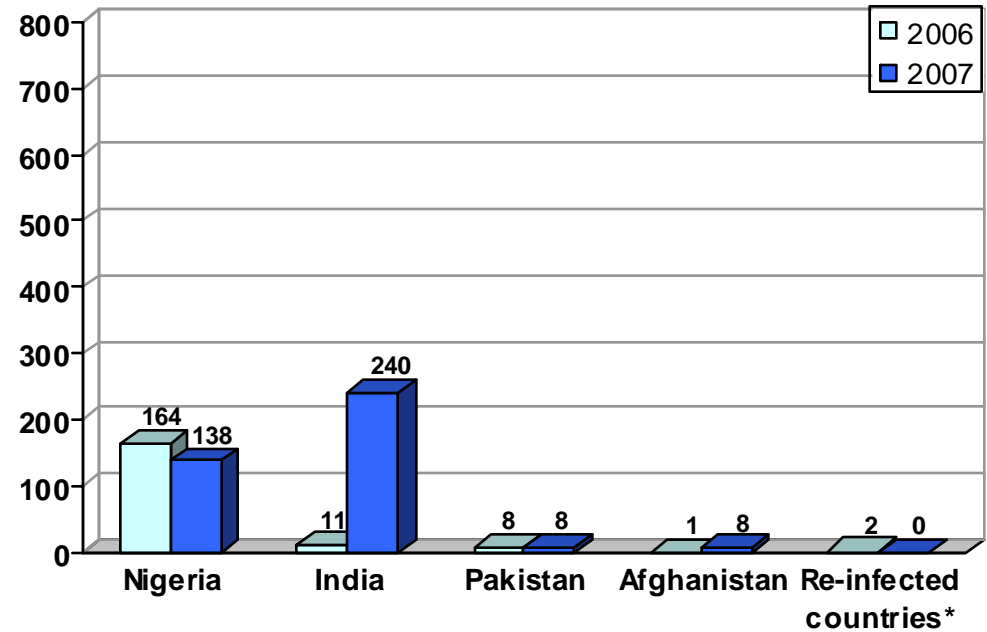
\*Bauchi, Borno, Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, Yobe, Zamfara

# Year-to-date comparison of polio cases due to wild poliovirus, 2006-2007

## Type 1



## Type 3



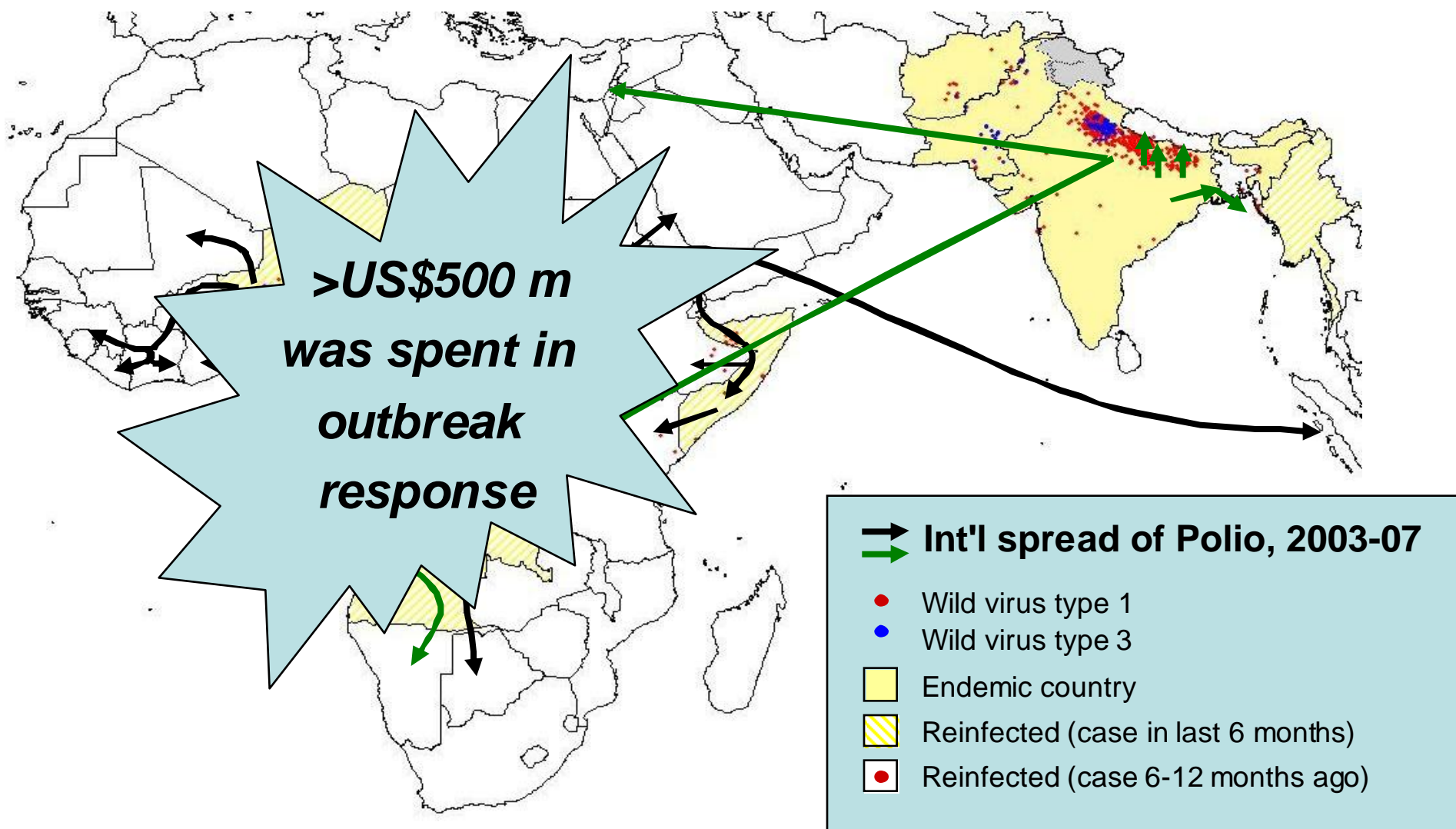
\* 2006 re-infected: Angola, Bangladesh, DR Congo, Ethiopia, Indonesia, Namibia, Nepal, Niger, Somalia, Yemen

\* 2007 re-infected: Angola, Chad, DR Congo, Myanmar, Niger, Somalia, Sudan

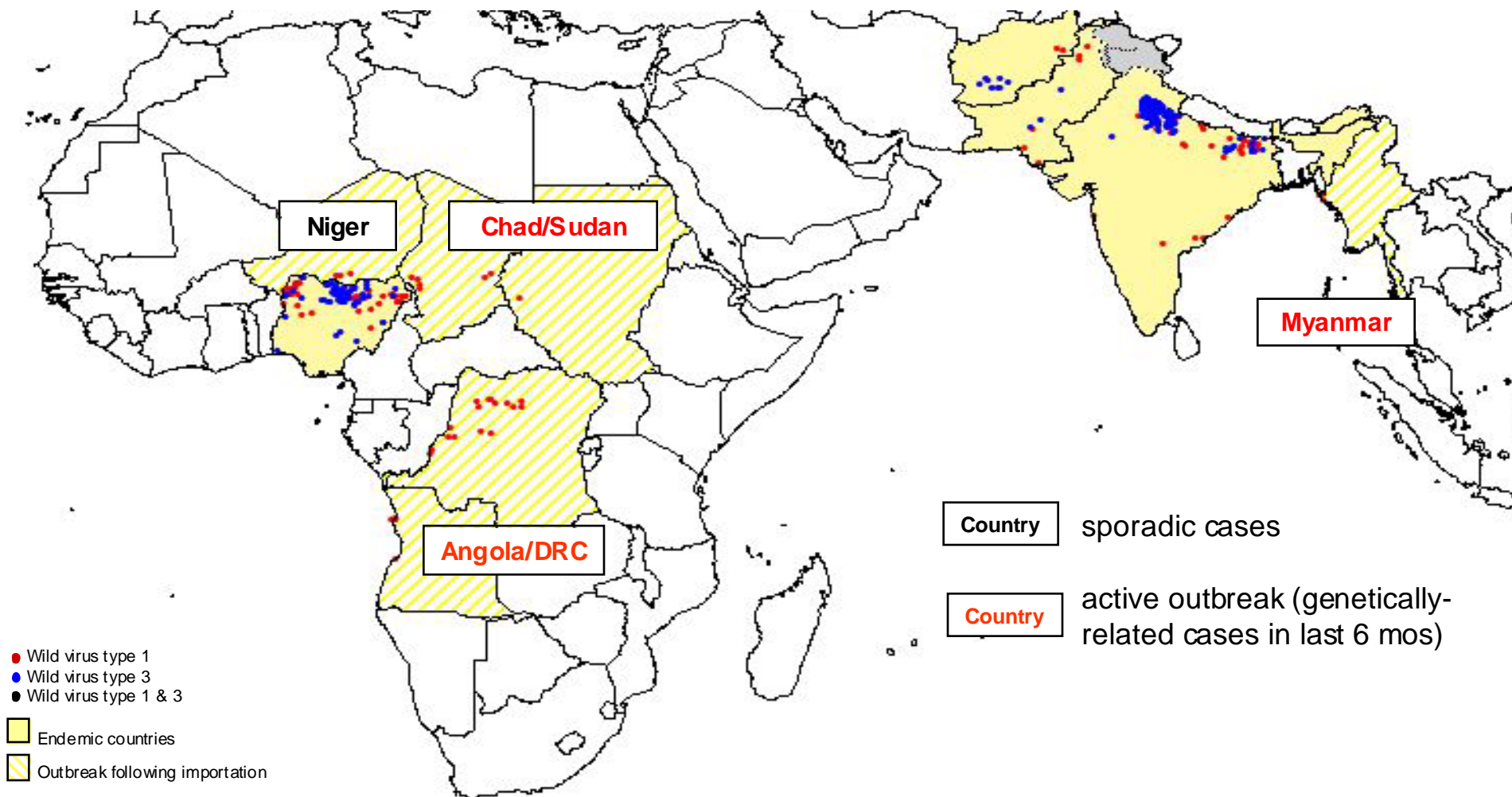
\*data at 16 October 2007

# ***Polio Outbreaks***

# International spread of polioviruses 2003-2007



# Active wild poliovirus outbreaks (16 Apr- 16 Oct 2007)



Rolling 6-months map 16 Apr 2007 - 16 Oct 2007  
Data in WHO HQ as of 16 Oct 2007

# Active Outbreaks – Most Recent Cases\*

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**Myanmar**                      **28 May 2007**

**Angola**                        **08 Jul 2007**

**Chad**                            **31 Aug 2007**

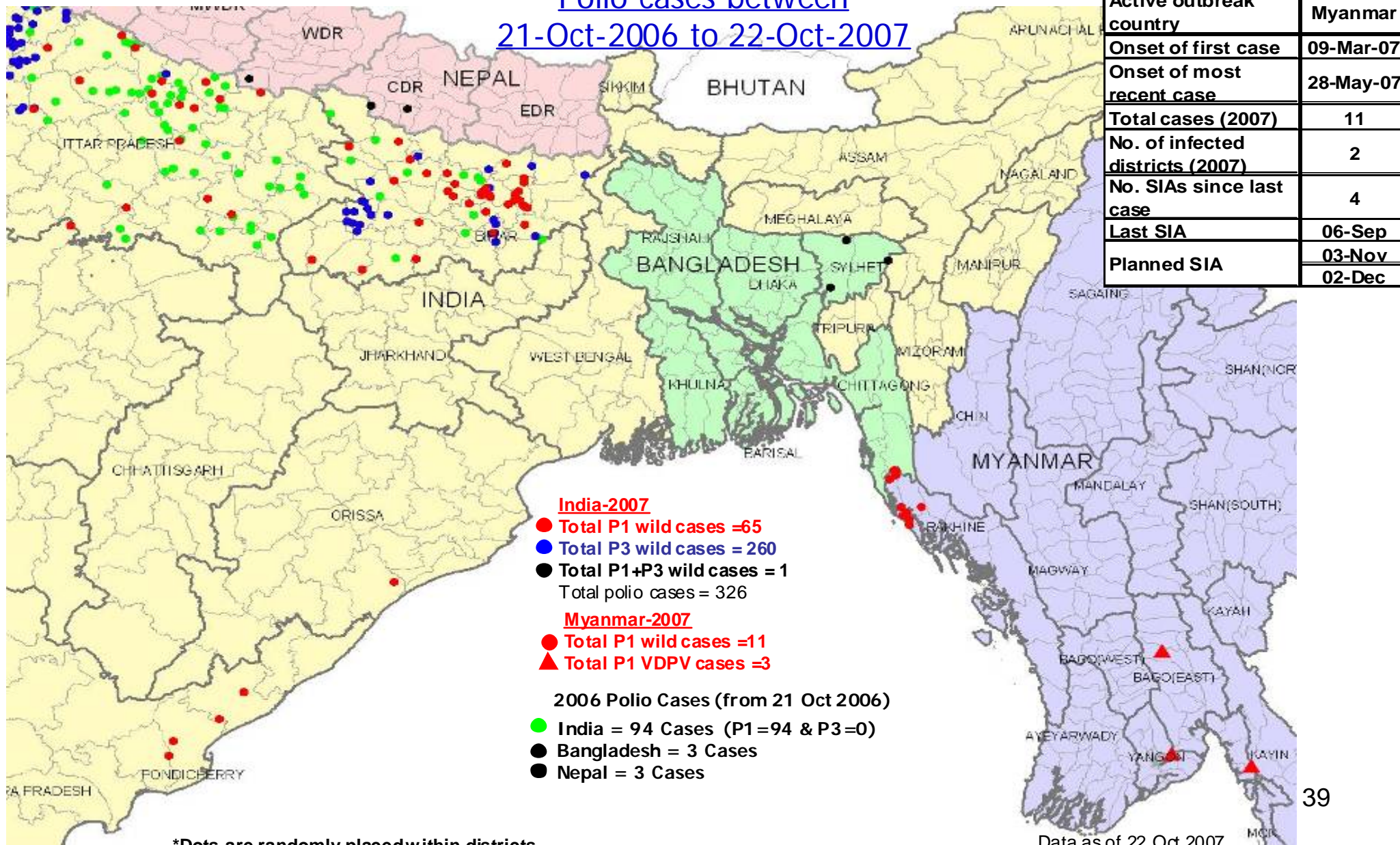
**DR Congo**                    **07 Sep 2007**

\*as of 23 October

# Polio and VDPV Cases in Last 12 Months

## Nepal, Northeast India, Bangladesh and Myanmar

Polio cases between  
21-Oct-2006 to 22-Oct-2007

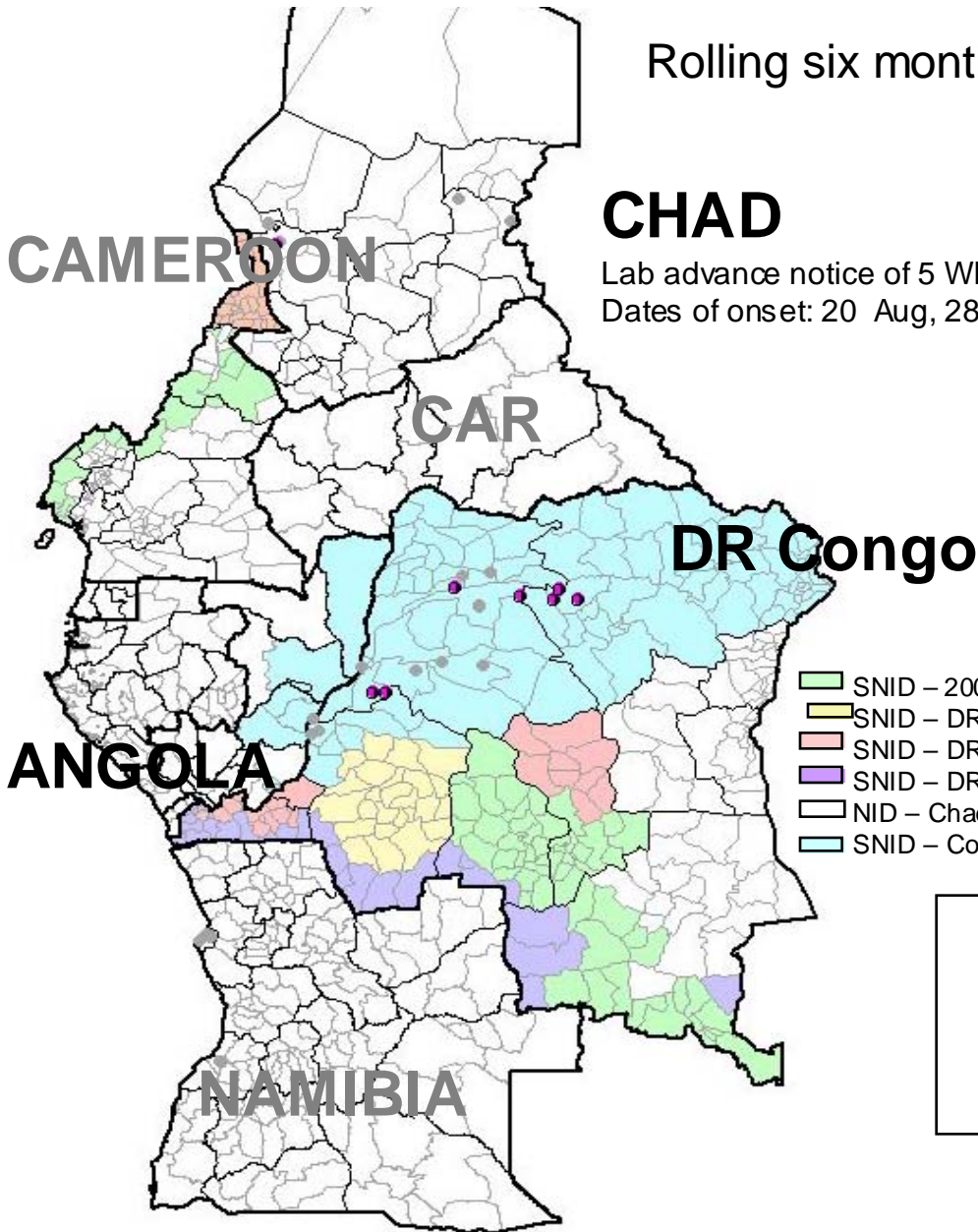


\*Dots are randomly placed within districts.

Data as of 22 Oct 2007

# Central Africa Wild Poliovirus and SIAs

Rolling six months: 24 Apr 07 to 23 Oct 07



## CHAD

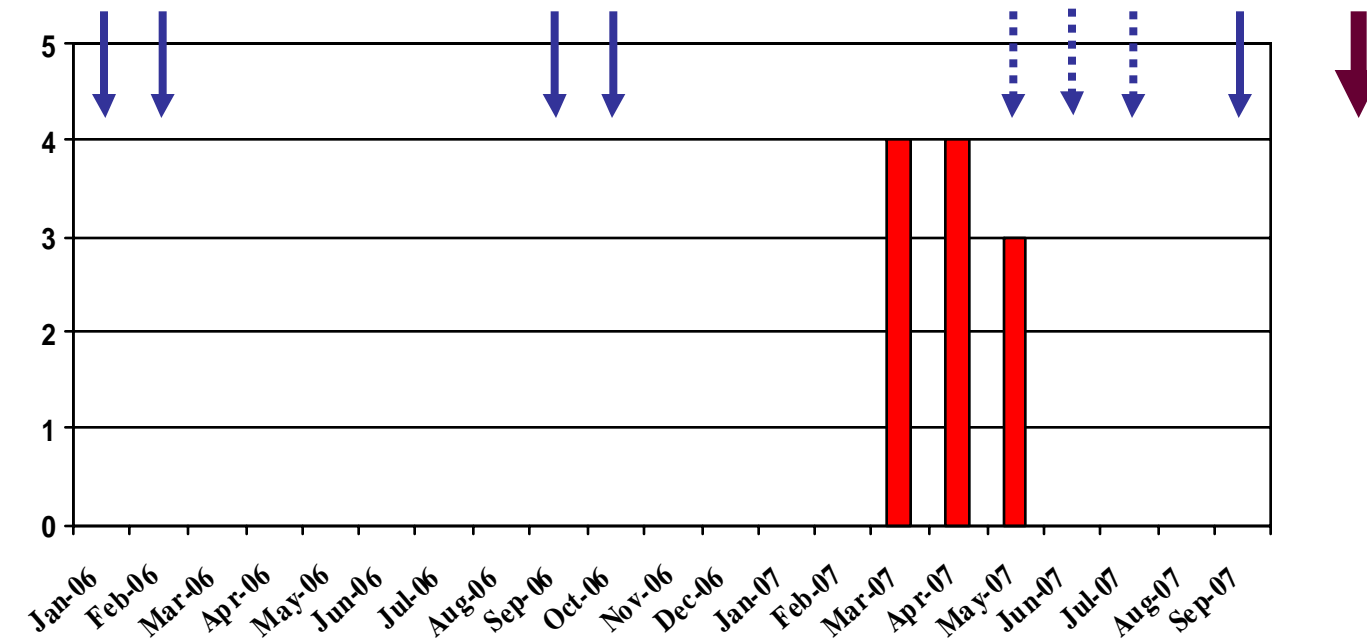
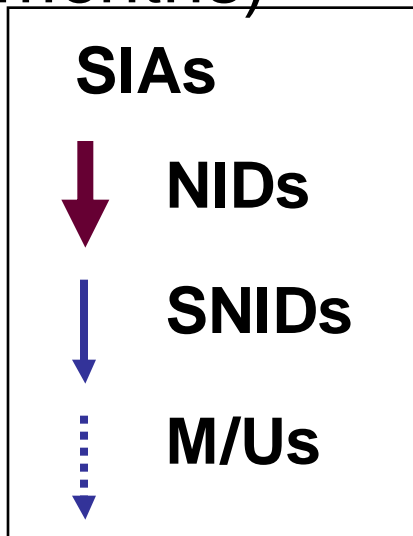
Lab advance notice of 5 WPV1 other cases in Chad.  
 Dates of onset: 20 Aug, 28 Aug, 3 Sep, 5 Sep, 6 Sep.

- W1 ▲ W3 (date of onset after most recent round)
- W1 ▲ W3 (date of onset followed by one round)
- W1 ▲ W3 (date of onset followed by at least two rounds)



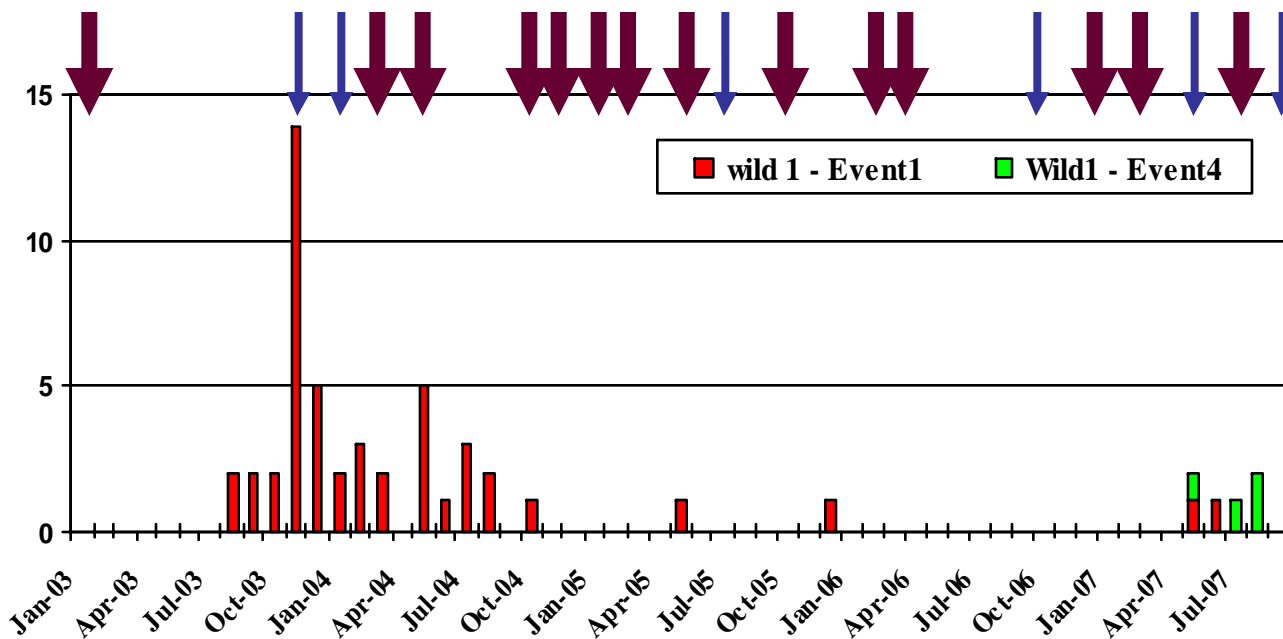
# Myanmar

(3 months)



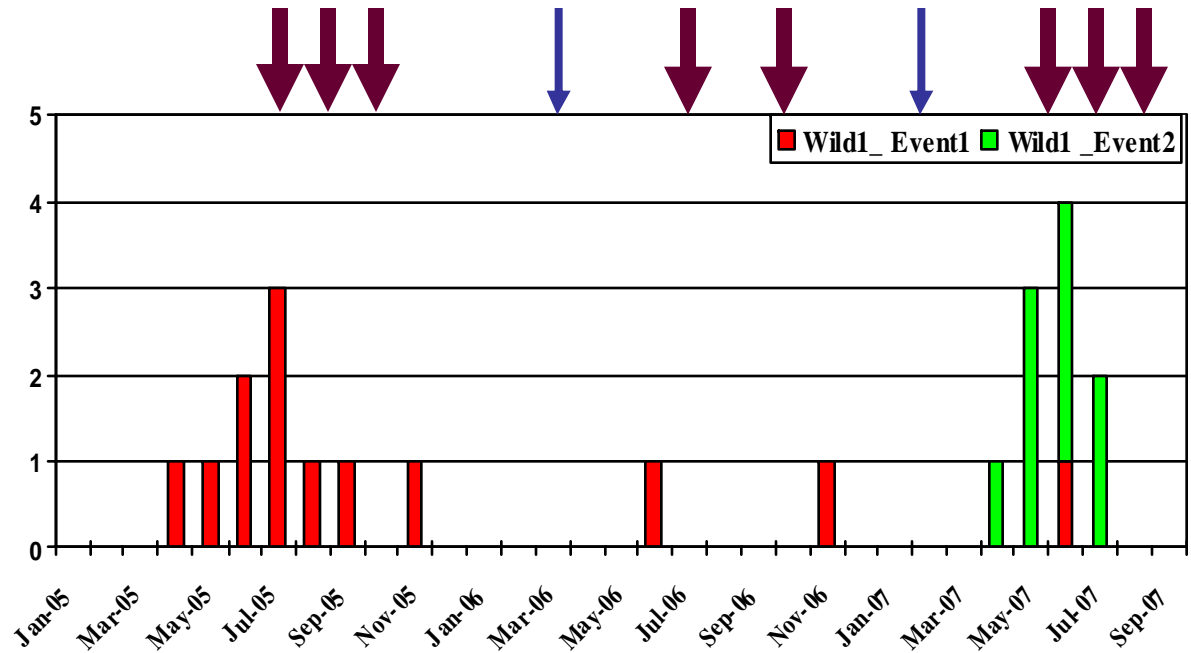
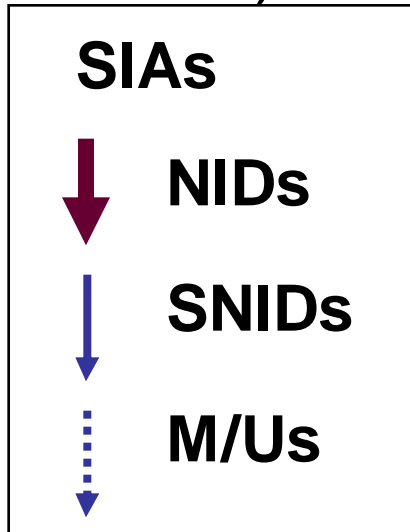
# Chad

(36 months!)



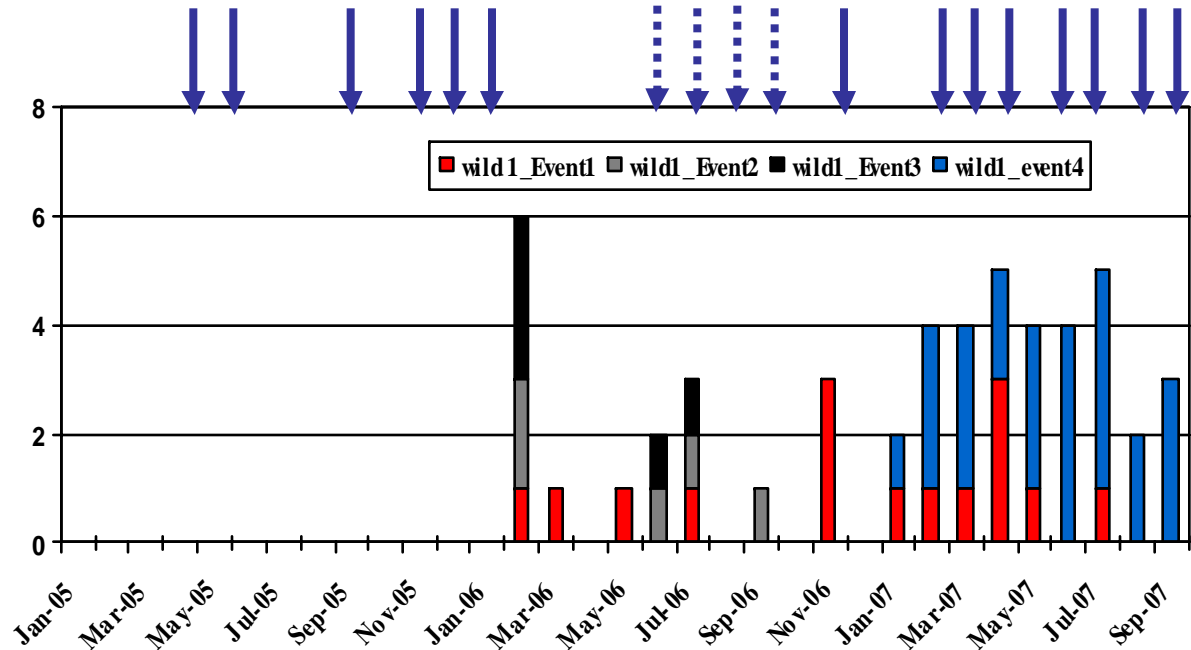
# Angola

(>24 months)



# DR Congo

(>18 months)



Data in HQ as of 15 Oct 2007

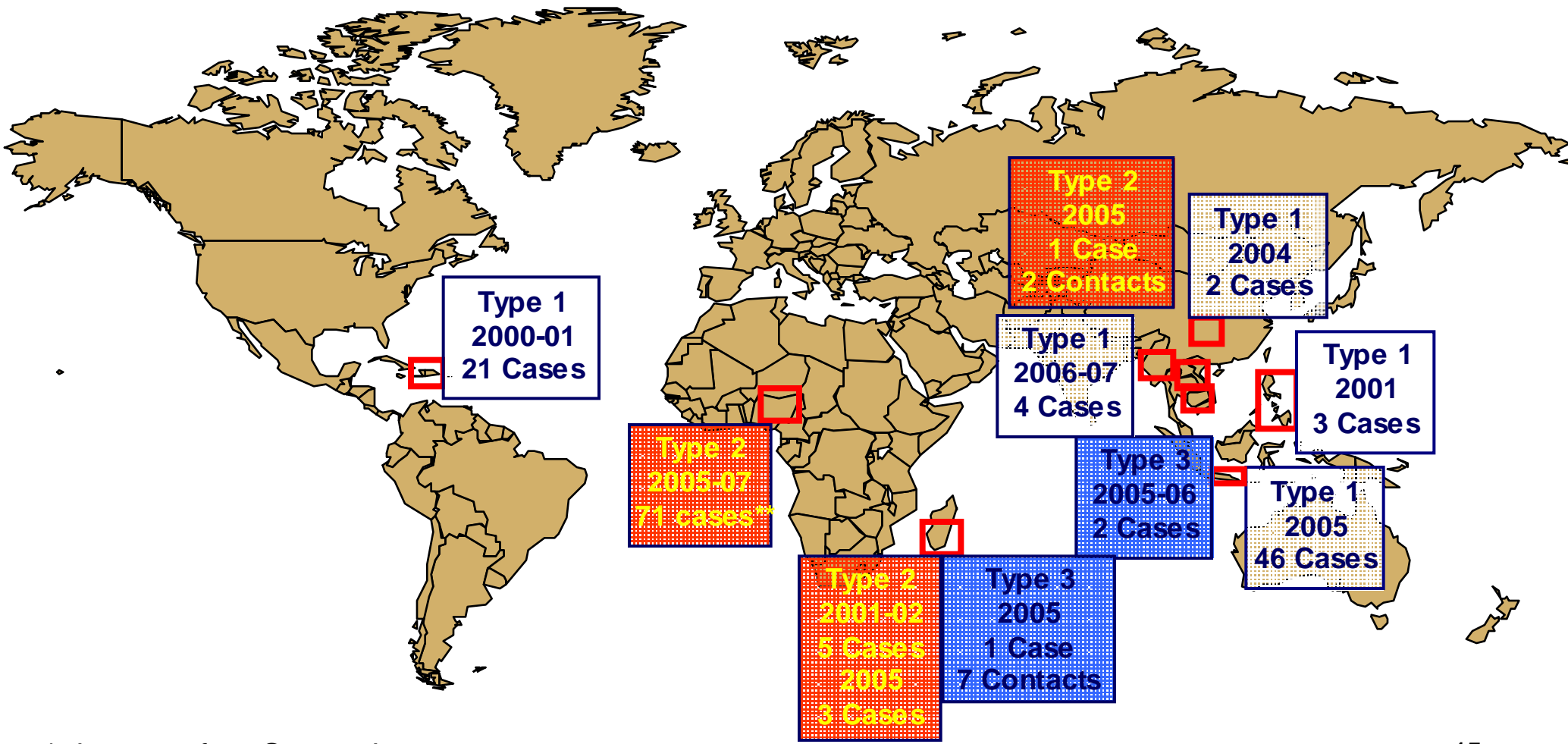
***The new outbreak response  
guidelines are extremely  
effective...  
WHEN FULLY IMPLEMENTED.***

# ***Vaccine-Derived Poliovirus Outbreaks***

***AKA cVDPVs***

***circulating Vaccine-Derived Polioviruses***

# circulating Vaccine-Derived Poliovirus Outbreaks (cVDPVs), 2000-2007\*

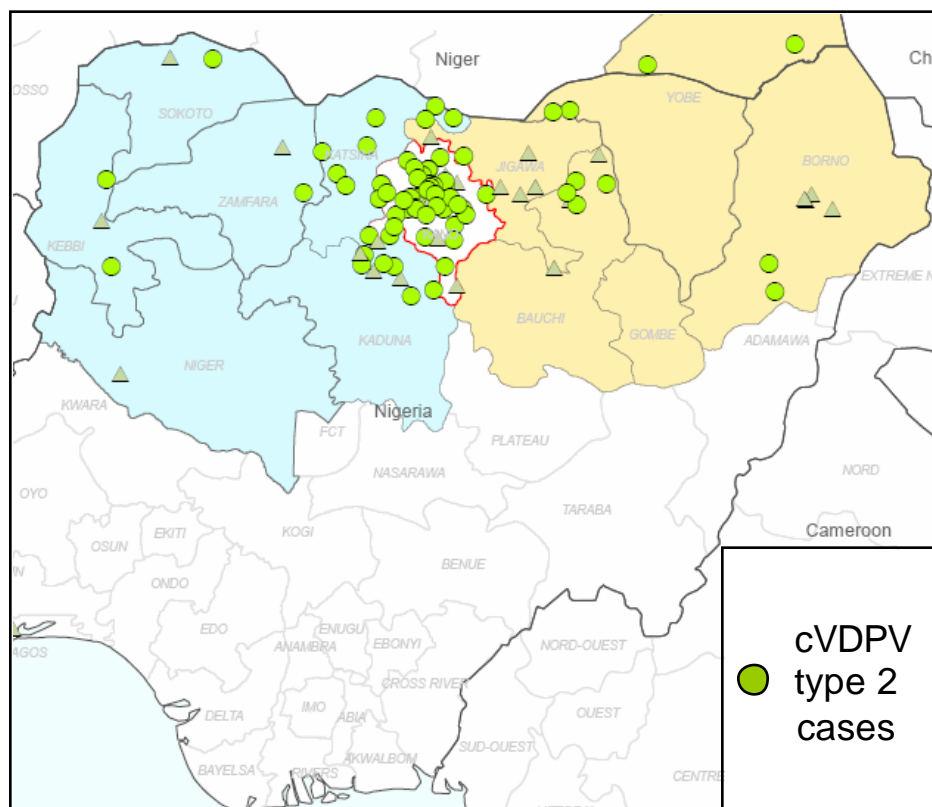


\* data as of 17 September 2007

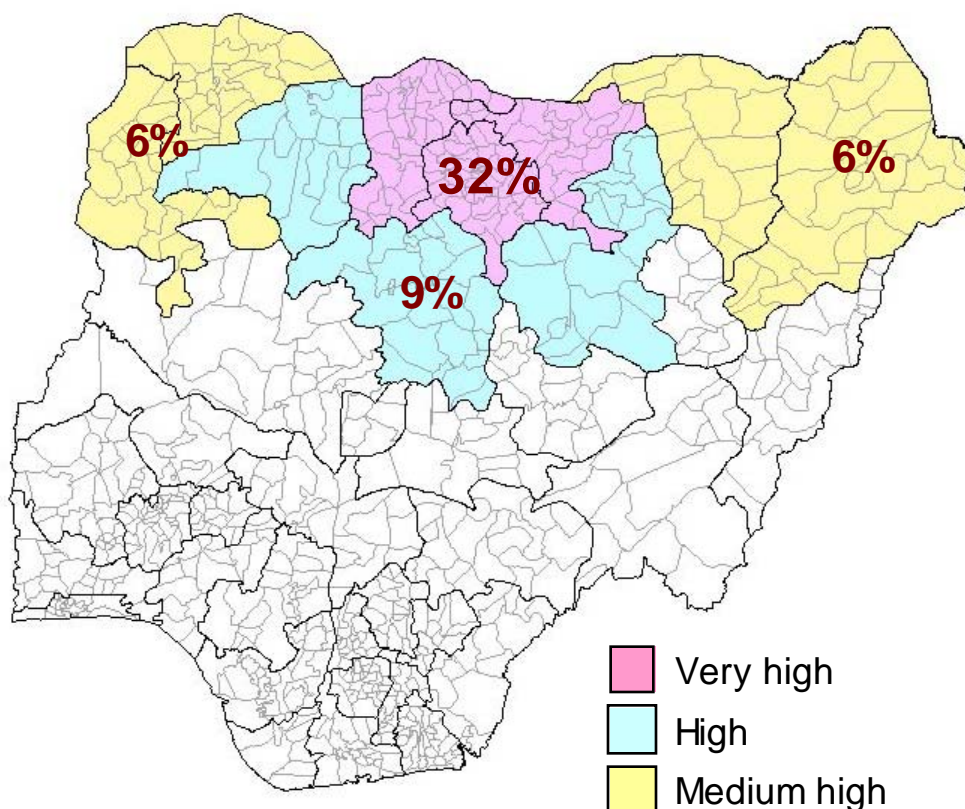
\*\*Nigeria 69 (plus 24 AFP cases with related viruses), Niger 2

# Nigeria circulating Vaccine-Derived Poliovirus Outbreak (cVDPV)

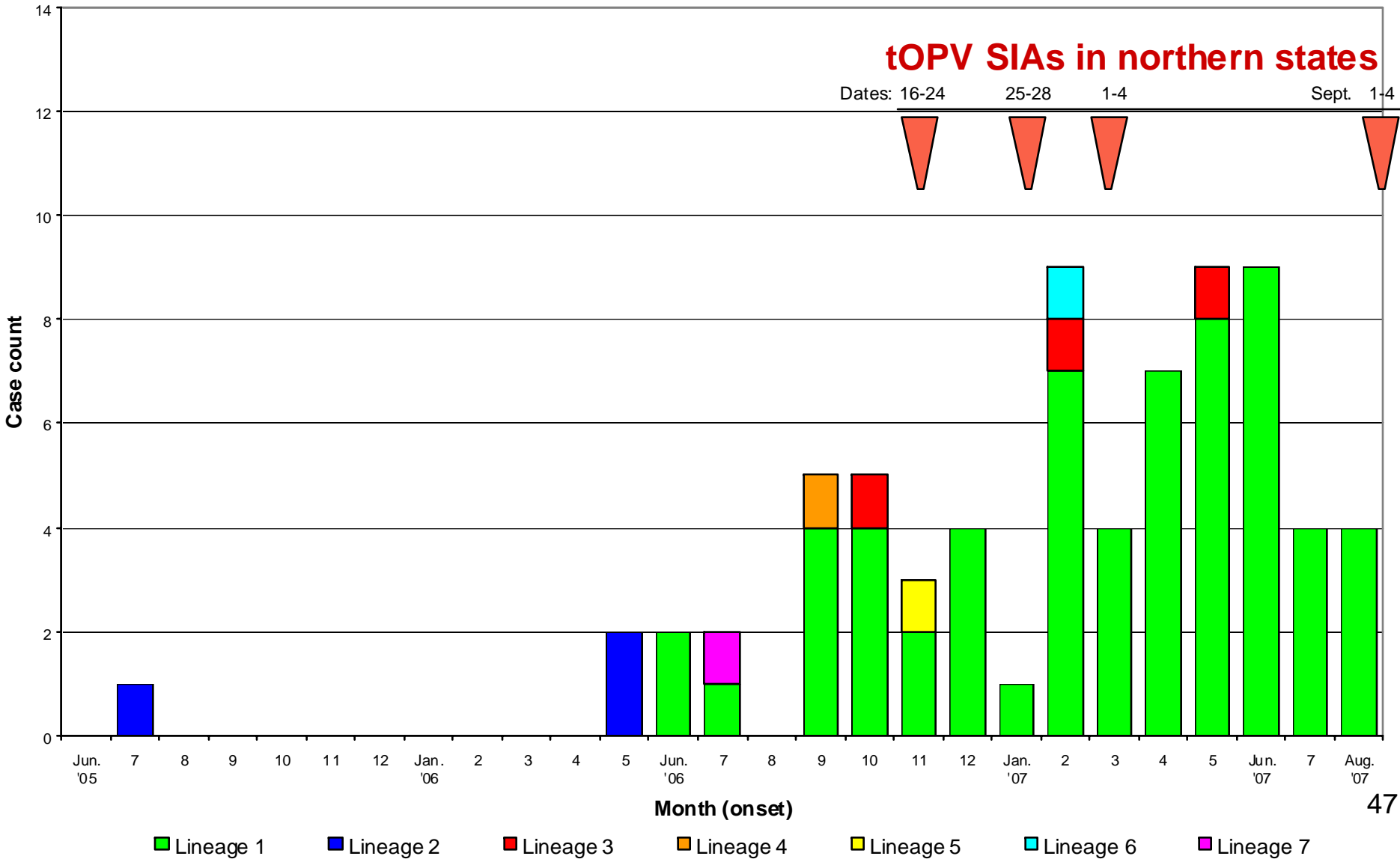
**cVDPV, Jul 06-Aug 07**



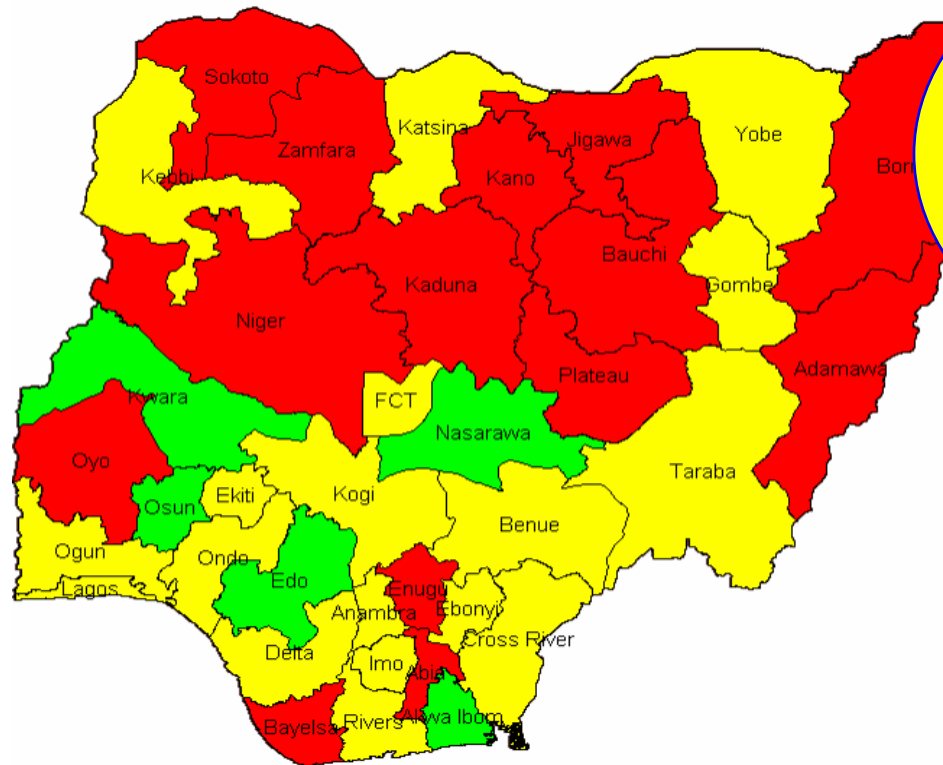
**Missed Children**



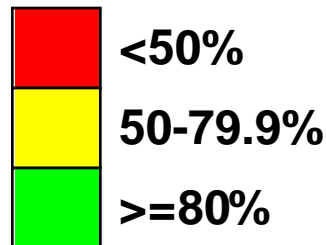
# Nigeria cVDPV type 2 cases, by lineage



# Nigeria Routine Immunization Performance: OPV3 coverage, Jan-Aug 2007

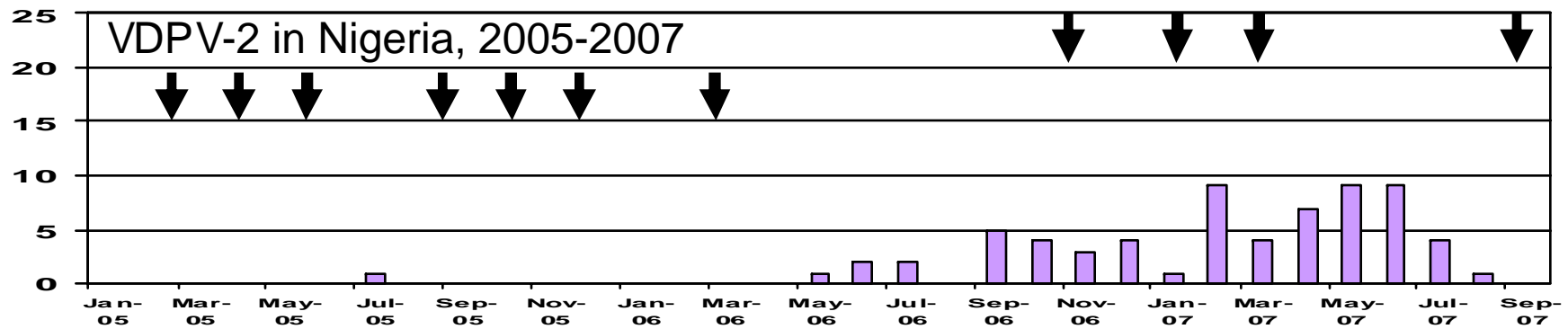
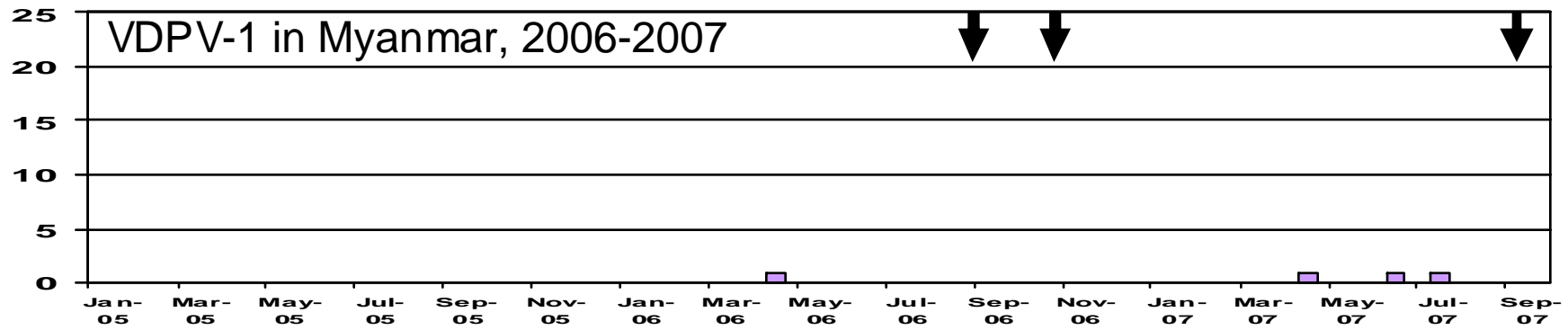
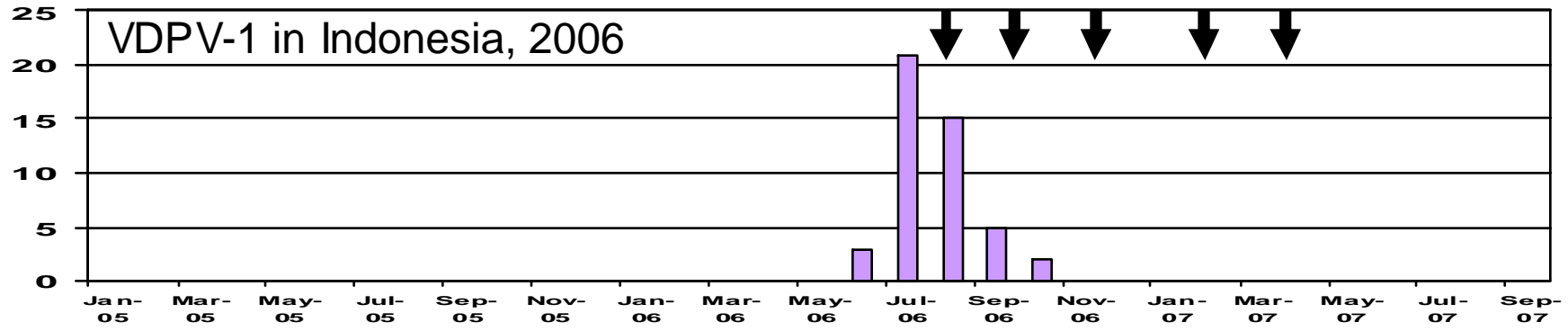


None of the polio-high risk States achieved target OPV3 coverage of 80%  
Of 12 high risk states, 9 have Routine OPV3 < 50%





# Emerging understanding of cVDPVs



# *Summary*

# Summary - Major Developments, 2007

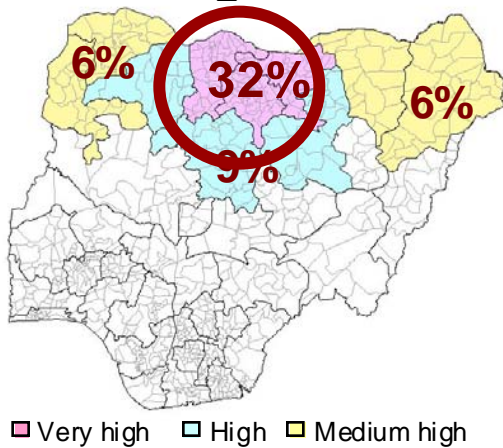
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- *WPV1 transmission reduced and more limited, particularly Western UP*
- Fewer new outbreaks than prior years; many outbreaks appear under control
- Intermediate but general progress by new milestones

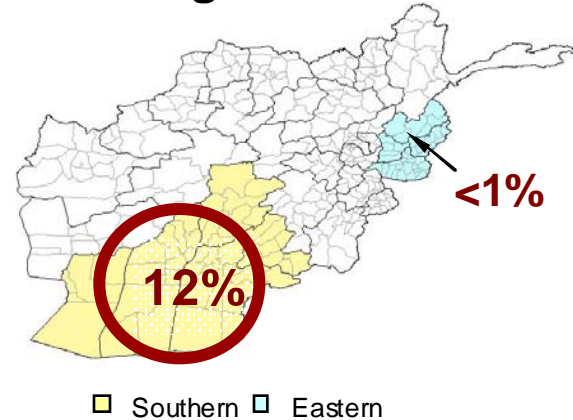
**Milestone:** by end-2007, polio vaccine coverage in endemic zones  $\geq$  polio-free zones in each country.

**Status:** 7 of 9 endemic transmission zones on track

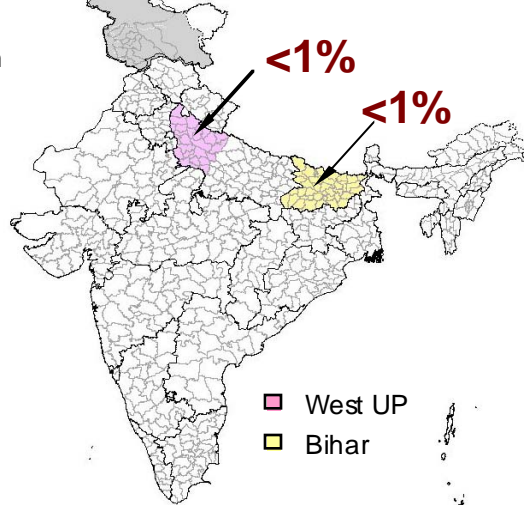
**Nigeria**



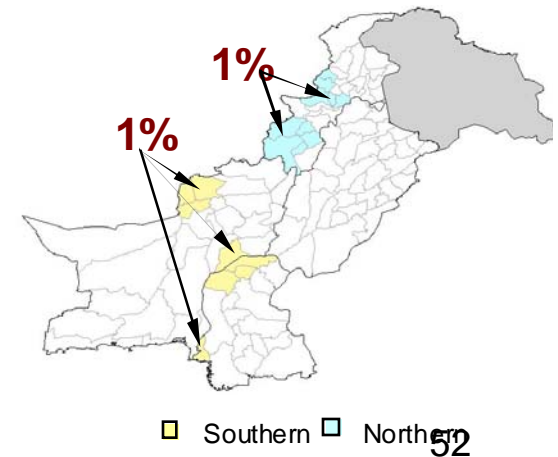
**Afghanistan**



**India**



**Pakistan**



\* as of 1 Oct 2007

**Milestone:** by end-2007, 50% reduction in infected districts in endemic countries.

***Status:*** 75% decline, type 1 polio infected districts.

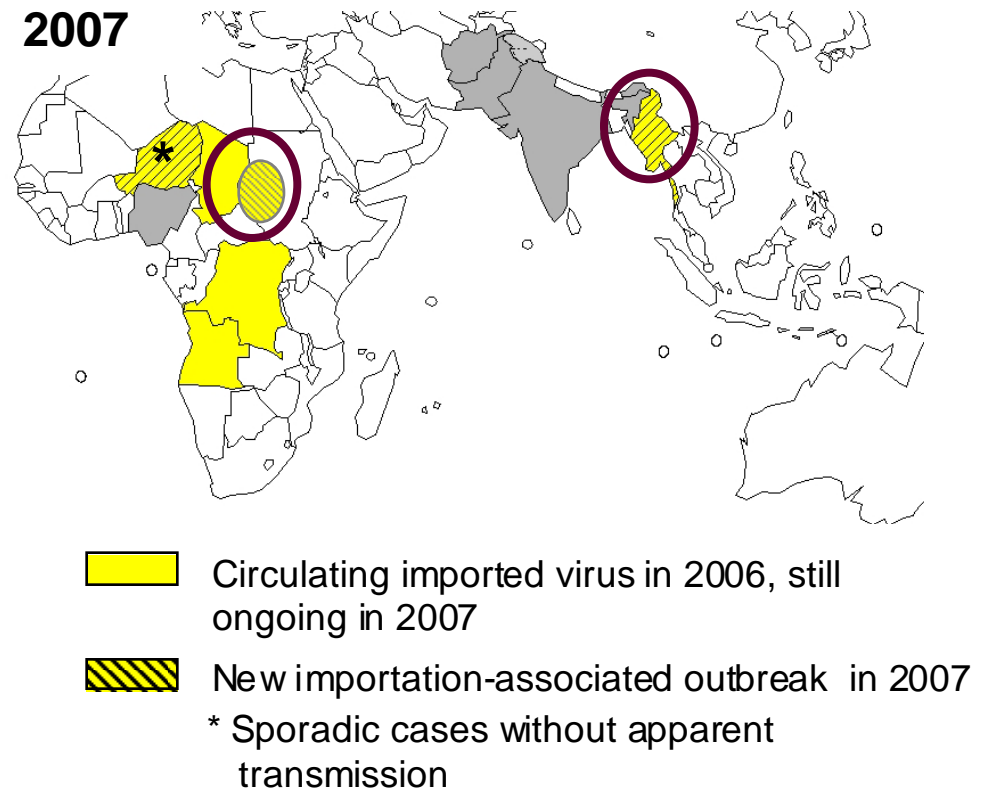
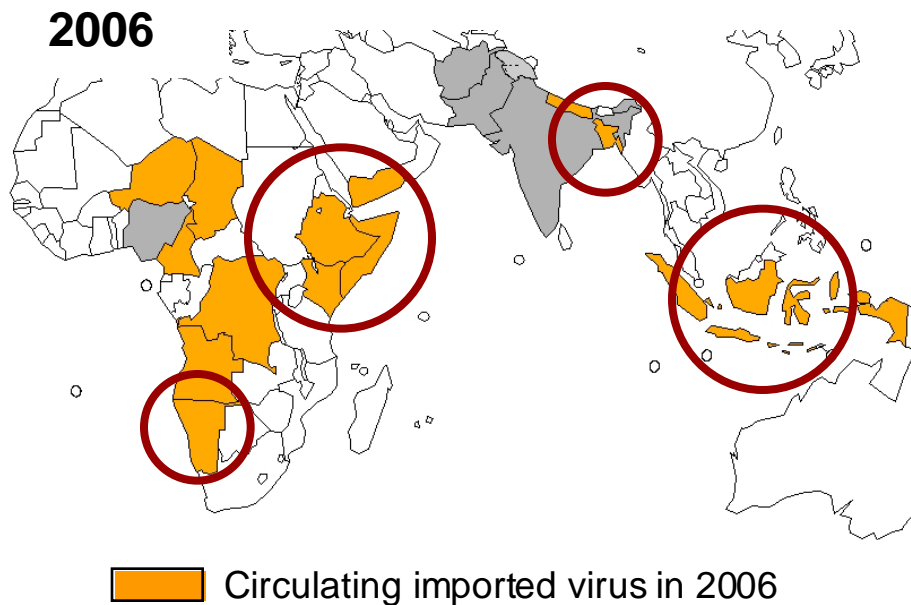
**Milestone:** by end-2007, outbreaks interrupted in countries with imported poliovirus in 2006.

***Status:*** outbreaks stopped in 10 of 13 countries.

**Milestone:** by end-2007, interruption of outbreaks in countries with circulation of imported poliovirus in 2006

**Status:** outbreaks stopped\* in 10 of 13 countries\*\*

*But...two new outbreak countries in 2007*



\* i.e. most recent case was before April 2007.

\*\* 31 of 35 separate importations have been stopped in the 13 countries.

# *Summary - Outbreak Control*

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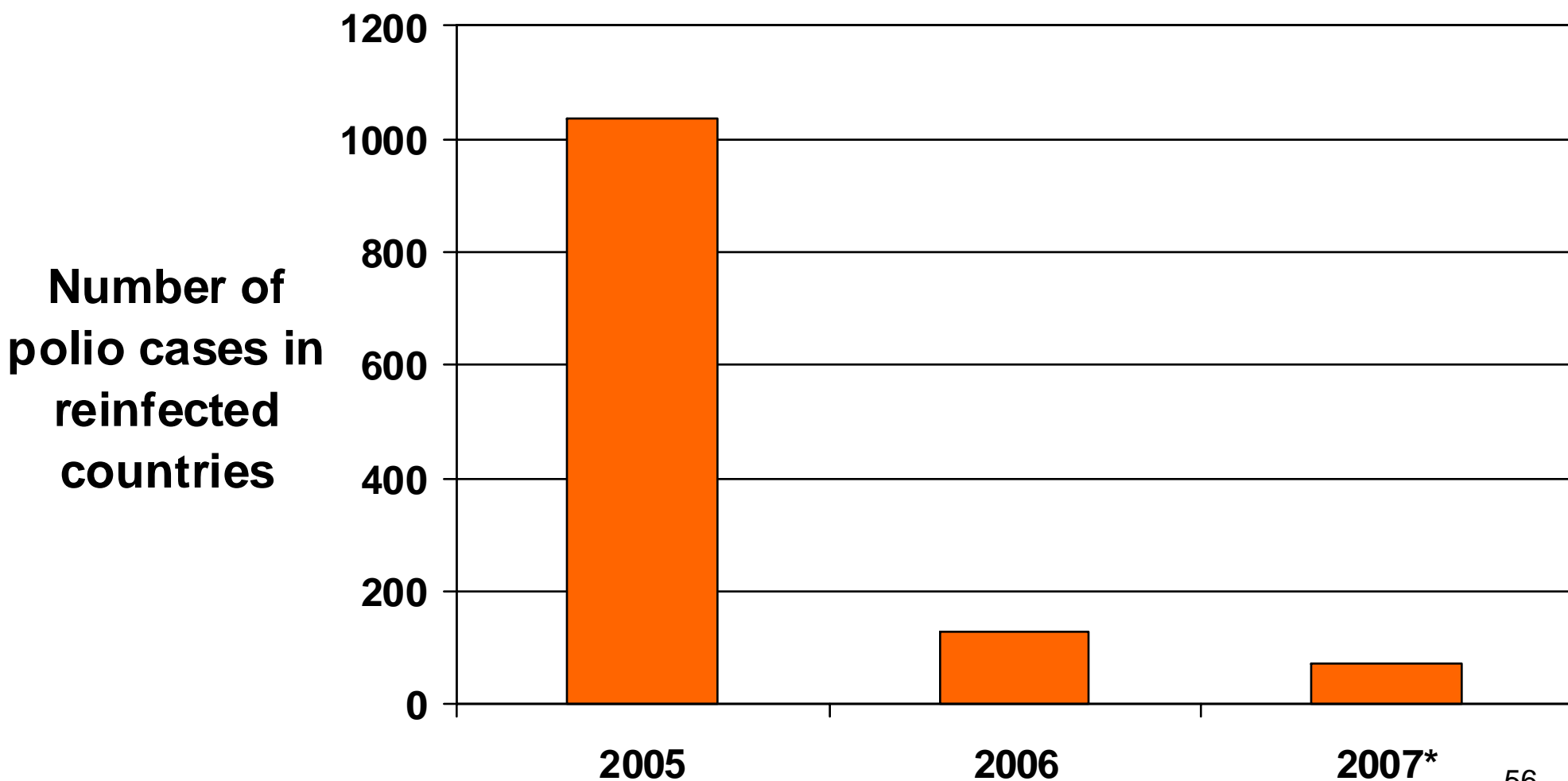
## Wild Poliovirus Outbreaks:

- The new tools & tactics have substantially reduced the number & size new outbreaks.
- Current risks: Angola, DR Congo, Chad/Sudan

## cVDPVs:

- recent cVDPVs suggest these should be responded to as aggressively as for wild polioviruses.
- Current risks: Nigeria, Myanmar

# Impact of new tactics on polio cases & outbreaks in reinfected areas



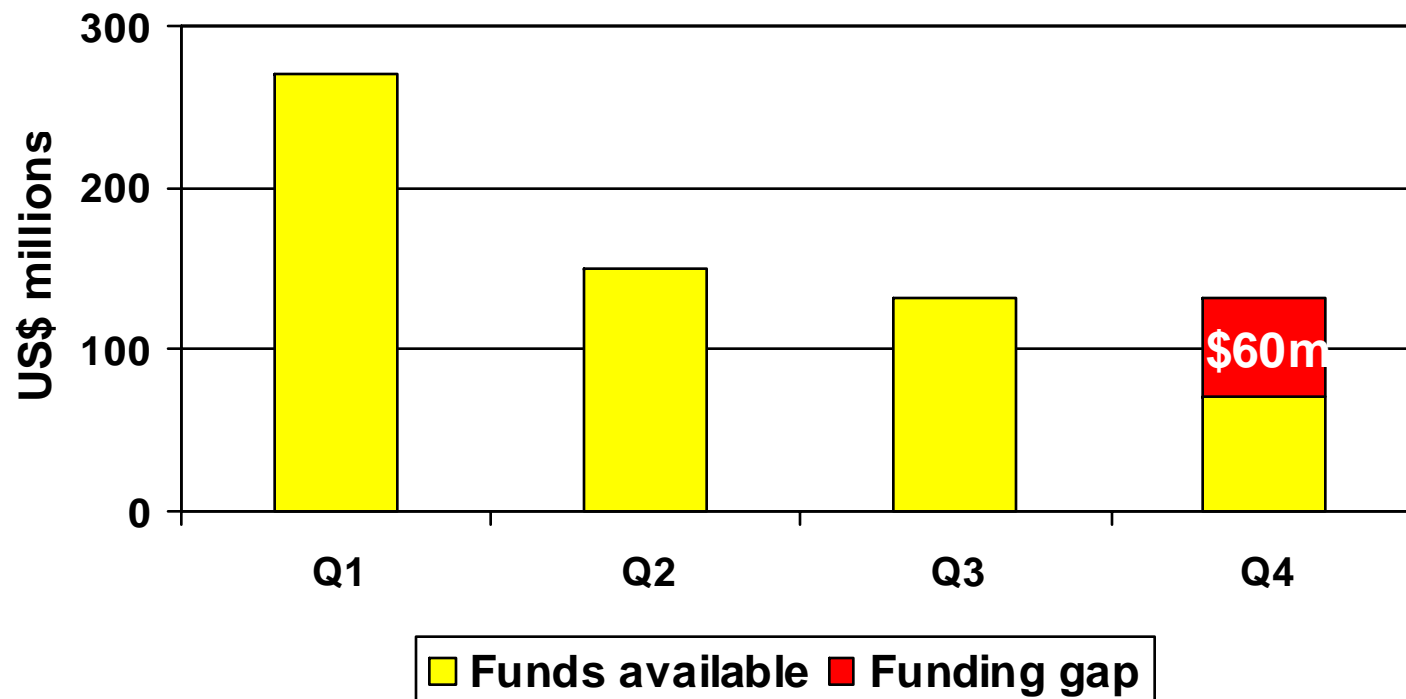
\* data as of 23 October 2007



**Milestone:** funding for 2007 activities by mid-year.

**Status:** missed; US\$ 60 million gap for 4<sup>th</sup> quarter\*

**Polio eradication budget & funding gaps  
by quarter, 2007**



\* essential activities may be postponed or cancelled if gap is not filled by November 2007.

# Summary - Major Challenges, 2008 - I

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- **India:** WPV3 outbreak in Uttar Pradesh & Bihar, continued WPV1 in Bihar: ensure sufficient response, not compromise enthusiasm & commitments.
- **Nigeria:** Many states remain with WPV1 & 3: reduce 'missed' children to <10% in northern states. cVDPV outbreak: ensure not misinterpreted or misused.

# Summary - Major Challenges, 2008 - II

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- **Pakistan/Afghanistan:** Access in endemic zones, security: Further enhance access to children in insecure & semi-autonomous areas.
- **Reinfected areas:** Ongoing WPV1 in Angola, Chad and DR Congo: Enhance outbreak response activities. Sudan outbreak to be contained.
- **All (but India):** Strengthen surveillance (India: Maintain)

# Meeting Major Challenges after interruption of WPV transmission

- **OPV cessation:** Continue/enhance research agenda for potential role of inactivated poliovirus vaccine (IPV); country consensus, coordination
- **Continuity:** Strong, efficient surveillance systems, strengthened routine immunization systems
- **Preparedness:** Vaccine stockpiles; research agenda on role of potent antivirals

# Thank You



**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
**CENTERS FOR DISEASE CONTROL AND PREVENTION**



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