

Corso di perfezionamento  
Vaccini e strategie di vaccinazione  
Firenze Giugno 2001

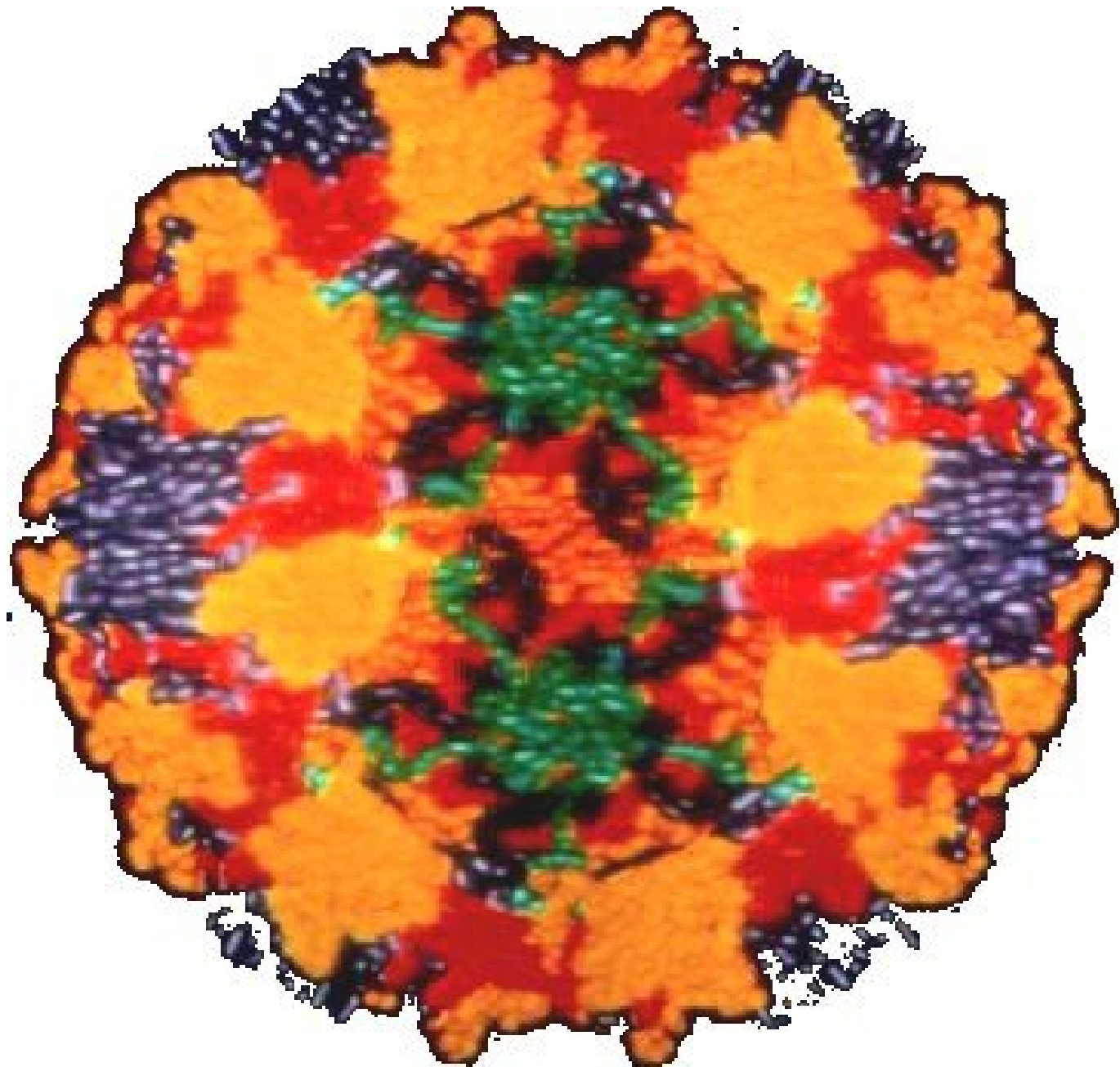
Verso l'eradicazione della  
poliomielite. Strategie di  
prevenzione per i prossimi anni e  
problemi da risolvere

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Laboratorio di Epidemiologia e Biostatistica  
Istituto Superiore di Sanità

**Roma**

*D. Greco LEB ISS 2001*



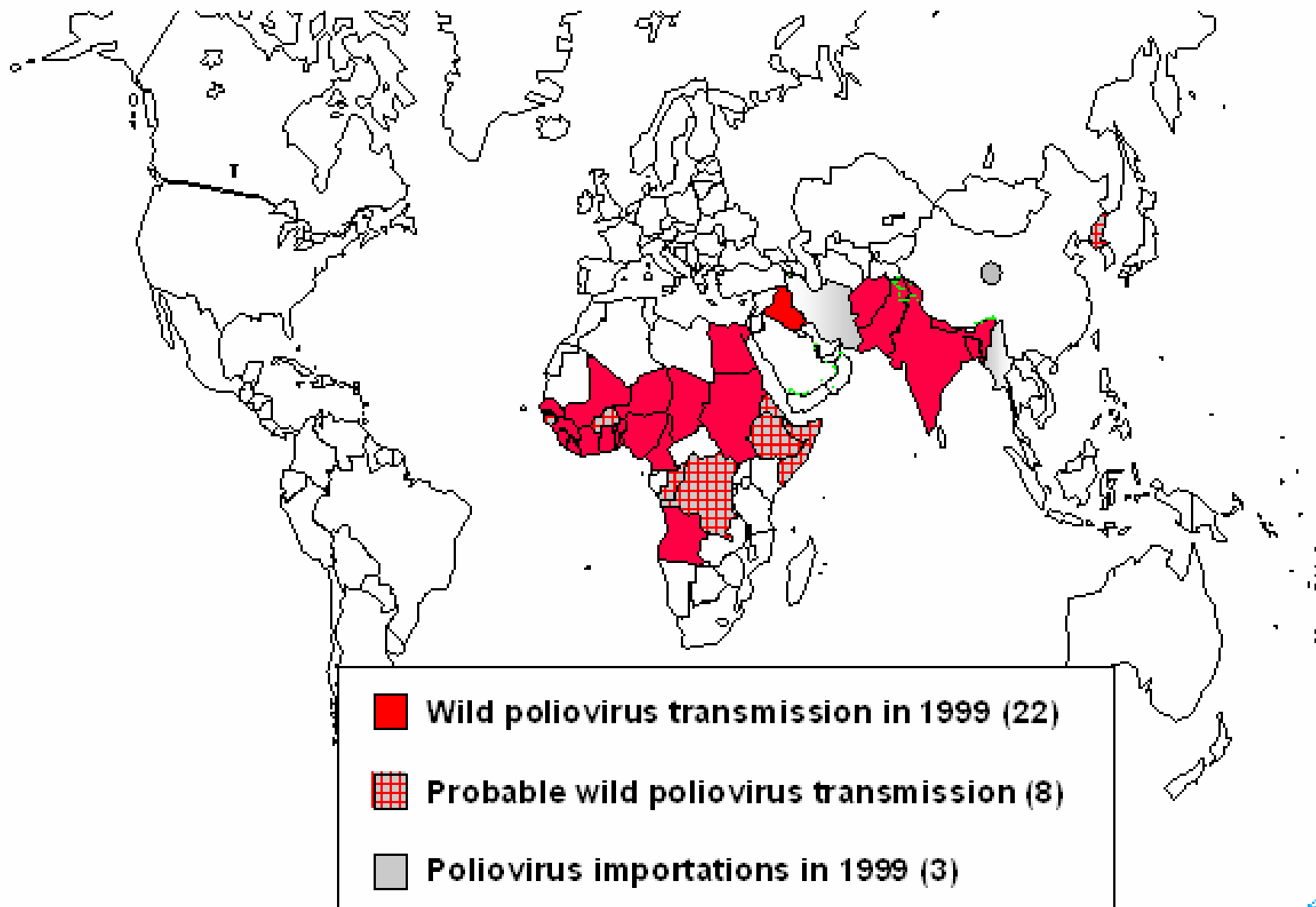




# Wild Poliovirus 1988

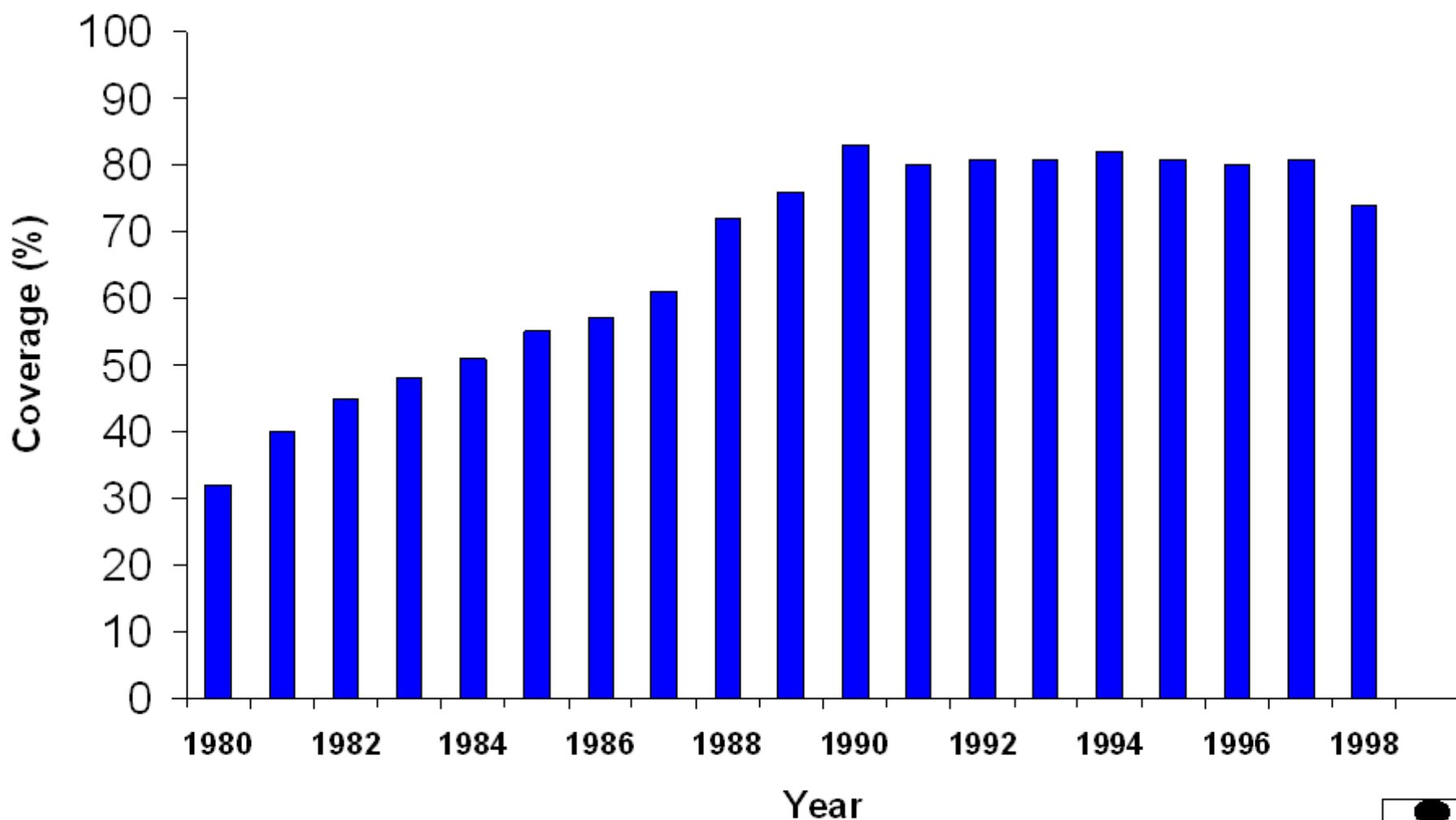


# Wild Poliovirus 1999



\* data as of 22 Dec 1999

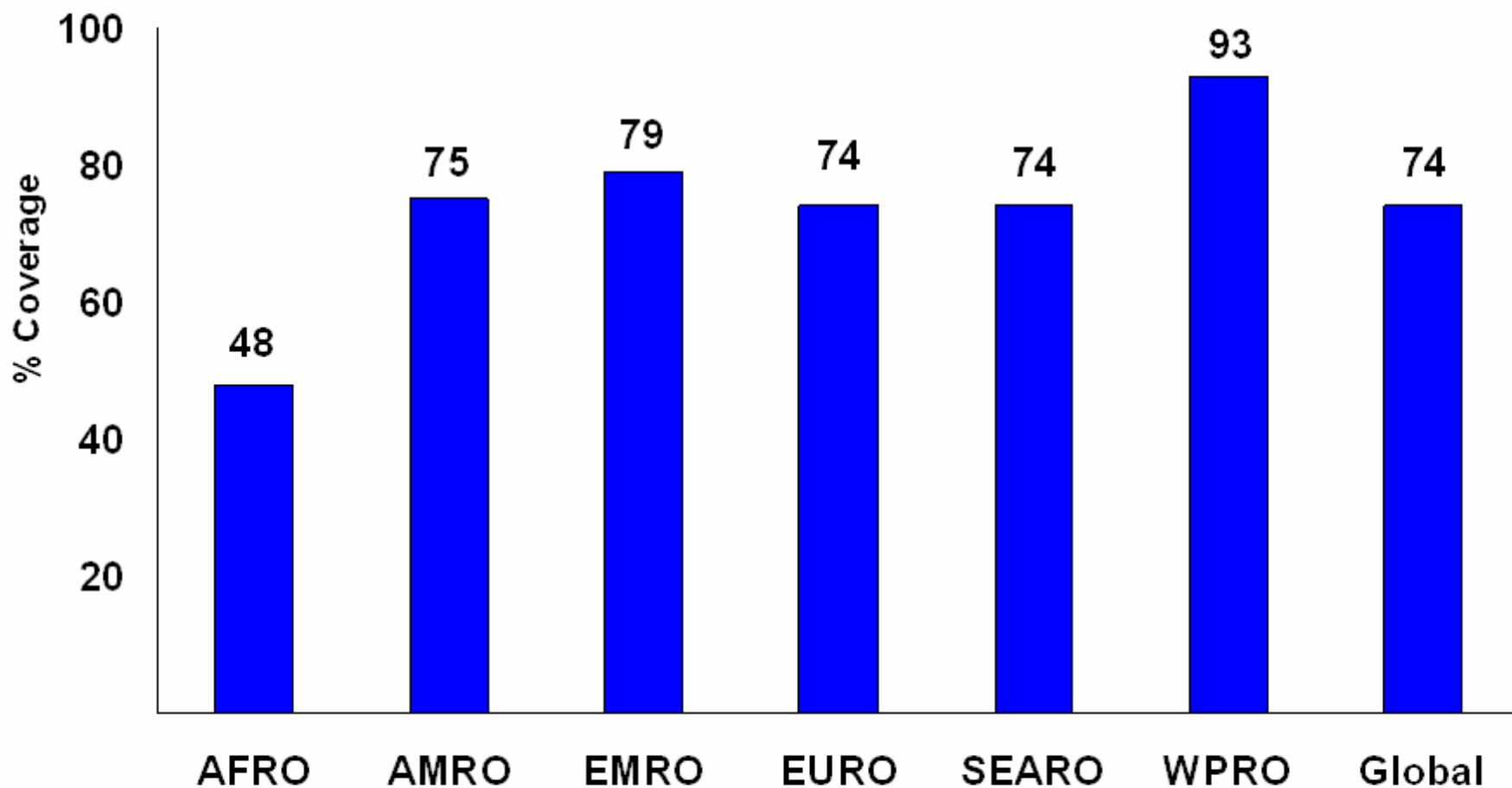
# Reported global coverage with 3 doses of polio vaccine among infants, 1980-1998



These data include **only** those countries that have reported data as of 14th August 1999



# Coverage with the third dose of polio vaccine in infants by WHO Region, 1998



WHO Regions

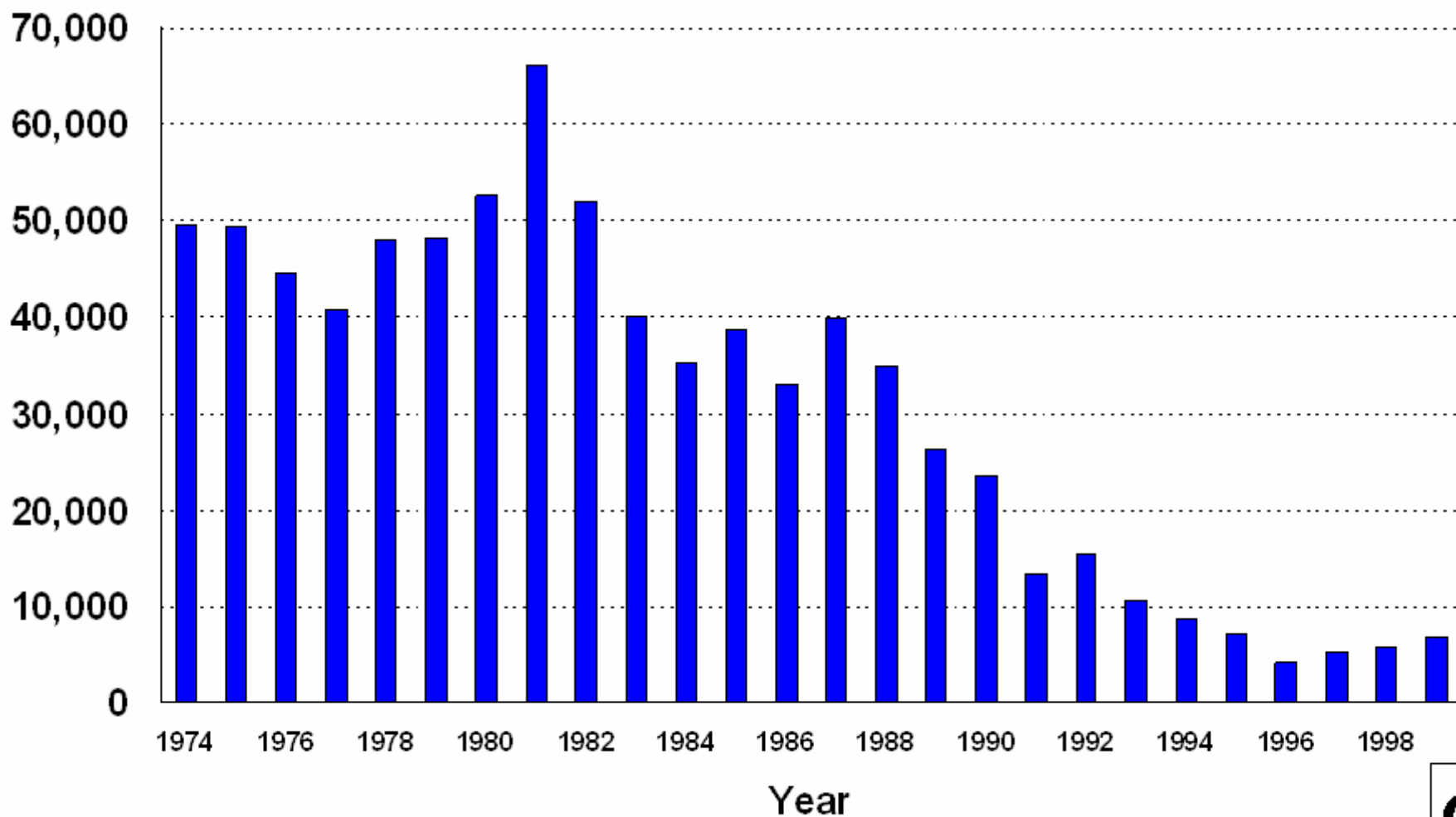


These data include **only** those countries that have reported data as of 14th August 1999



# Global annual reported polio cases, 1974-1999

Reported cases

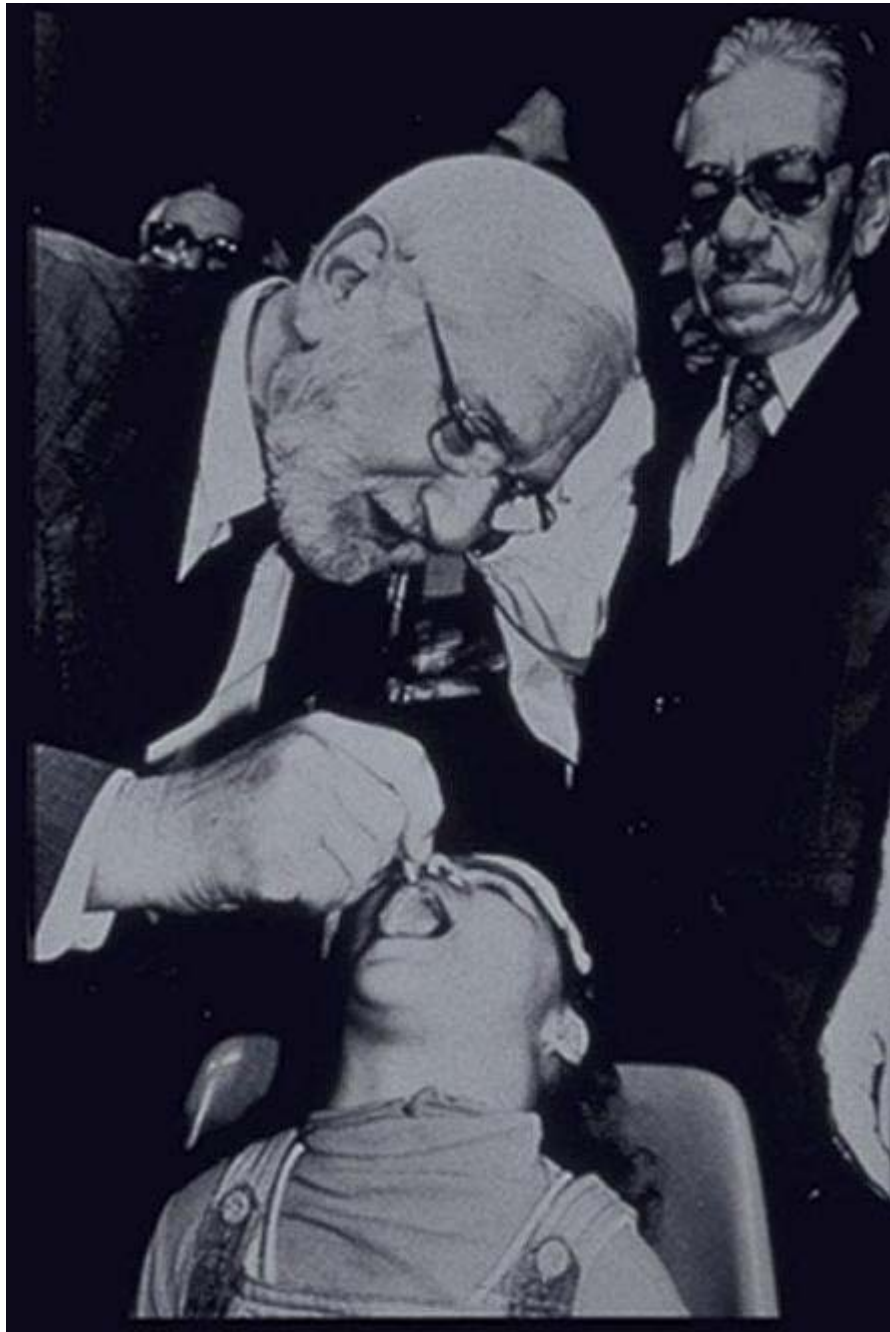


These data include **only** those countries that have reported data as of 2nd March 2000

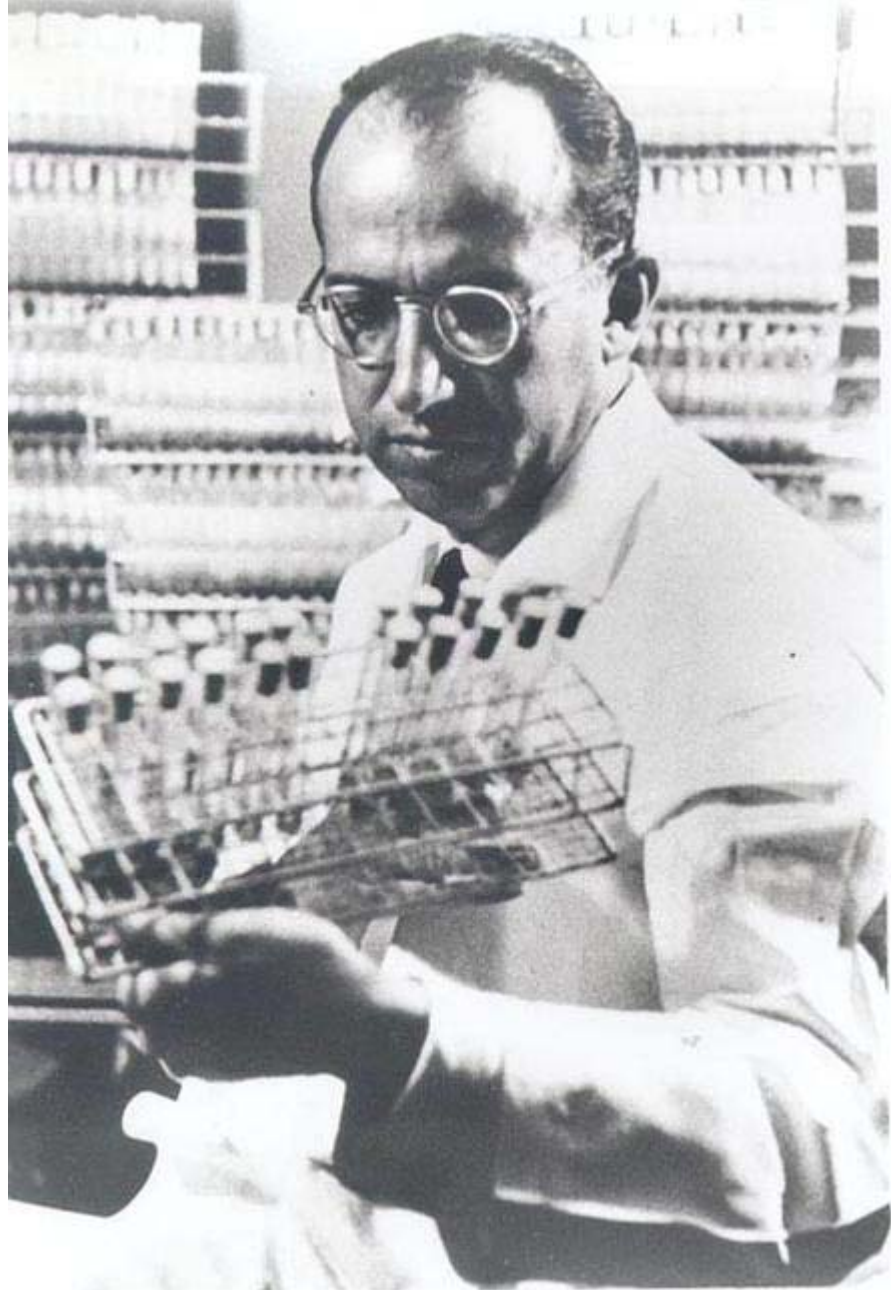


# **Poliomielite**

- **Strategia universale di eradicazione della polio**
- **Elevata copertura vaccinale ma presenza di aree con consistenti ritardi vaccinali**
- **Obiettivi:**
  - **mantenere elevata la copertura vaccinale ed incrementarla laddove non sia soddisfacente**
  - **ridurre i ritardi vaccinali**
  - **passare allo schema sequenziale IPV + OPV**







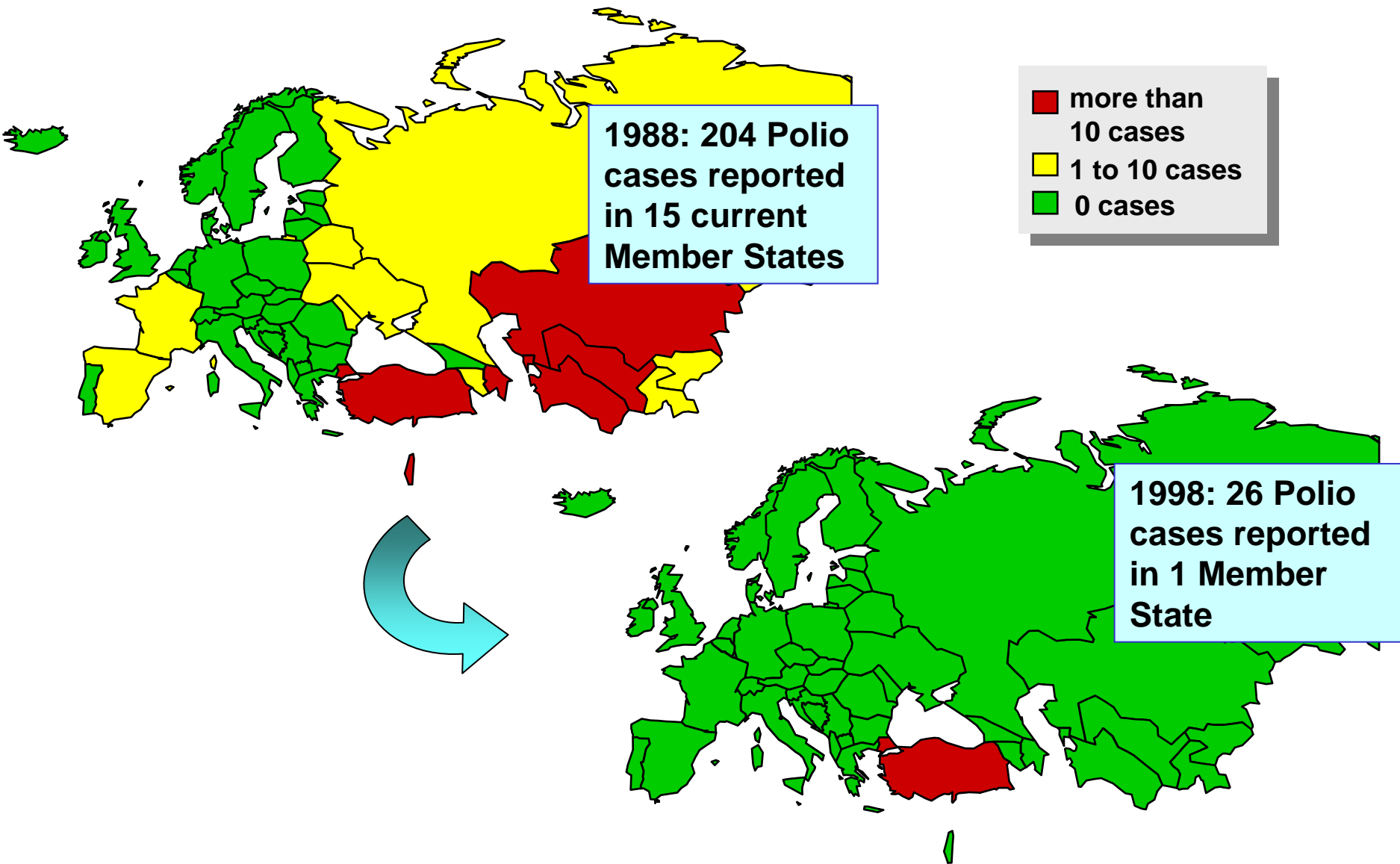
WHO/5832 AMRO POLIO USA MED 1995

Dr Jonas Salk who developed the first polio vaccine in 1955.

*Le Dr Jonas Salk, "père" du premier vaccin antipoliomyélique mis au point en 1955.*

PLEASE CREDIT PHOTO WHO/USIS

# WHO European Region Incidence of Indigenous Poliomyelitis, 1988 and 1998



# Polio: Last Cases



**Americas Region  
Luis Fermin Tenorio  
Peru 1991**



**European Region  
Melik Minas  
Turkey 1998**



**Western Pacific  
Region  
Mum Chanty  
Cambodia 1997**

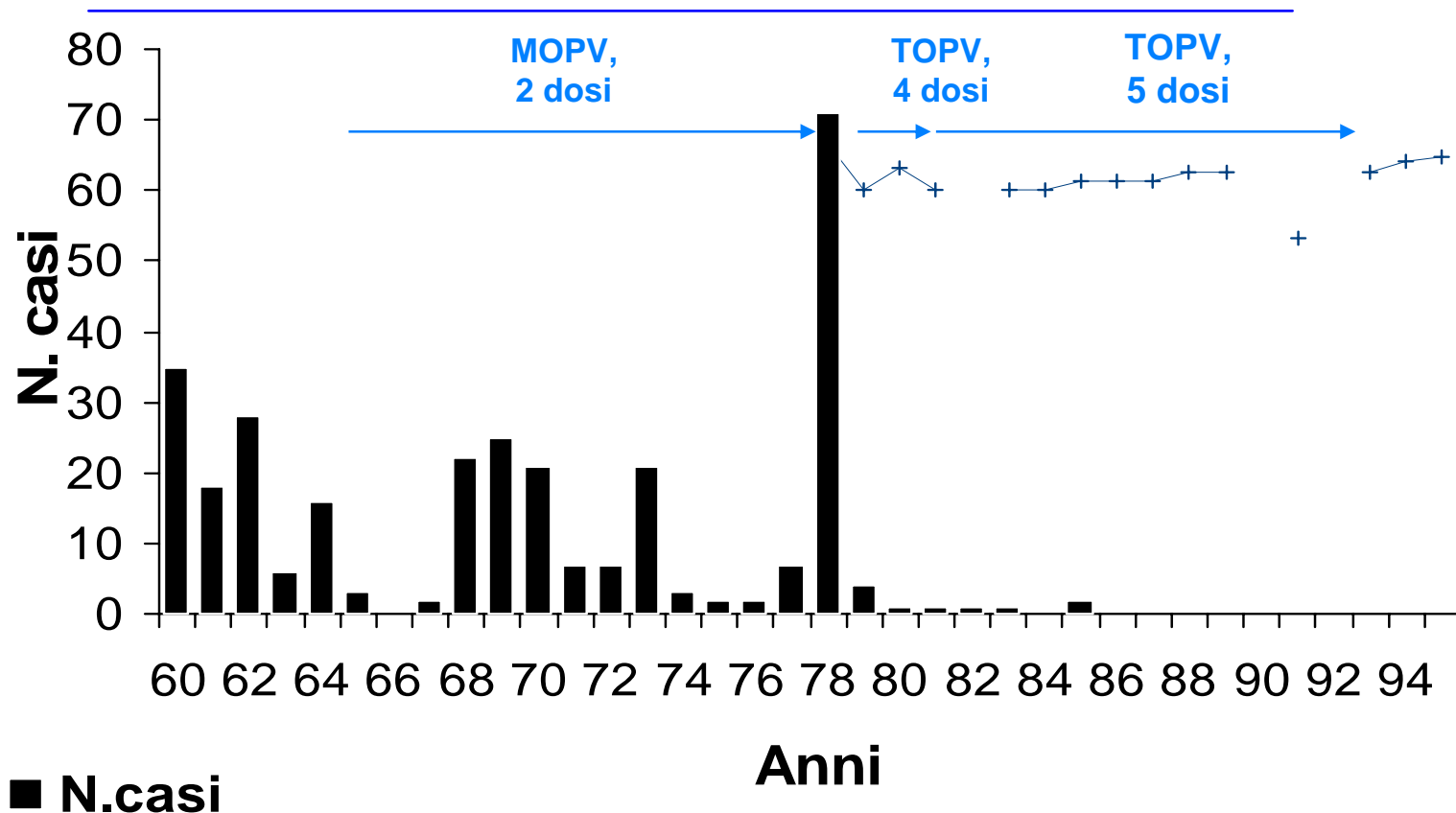
# Italy, immunisation schedule 1999

Vaccino	nascita	3° mese	5° mese	11° mese	12° mese	15° mese	3° anno	5-6 anni	11-12 anni	14-15 anni
DTP		DTP	DTP	DTP				DTP	Td	
Antipolio		IPV	IPV	OPV			OPV			
Epatite B	Epatite B-0*	Epatite B	Epatite B	Epatite B					Epatite B§	
MPR					MPR**			MPR†		
Hib		Hib	Hib	Hib						

B. Le barre ombreggiate indicano gli ambiti temporali accettabili per la somministrazione dei vaccini

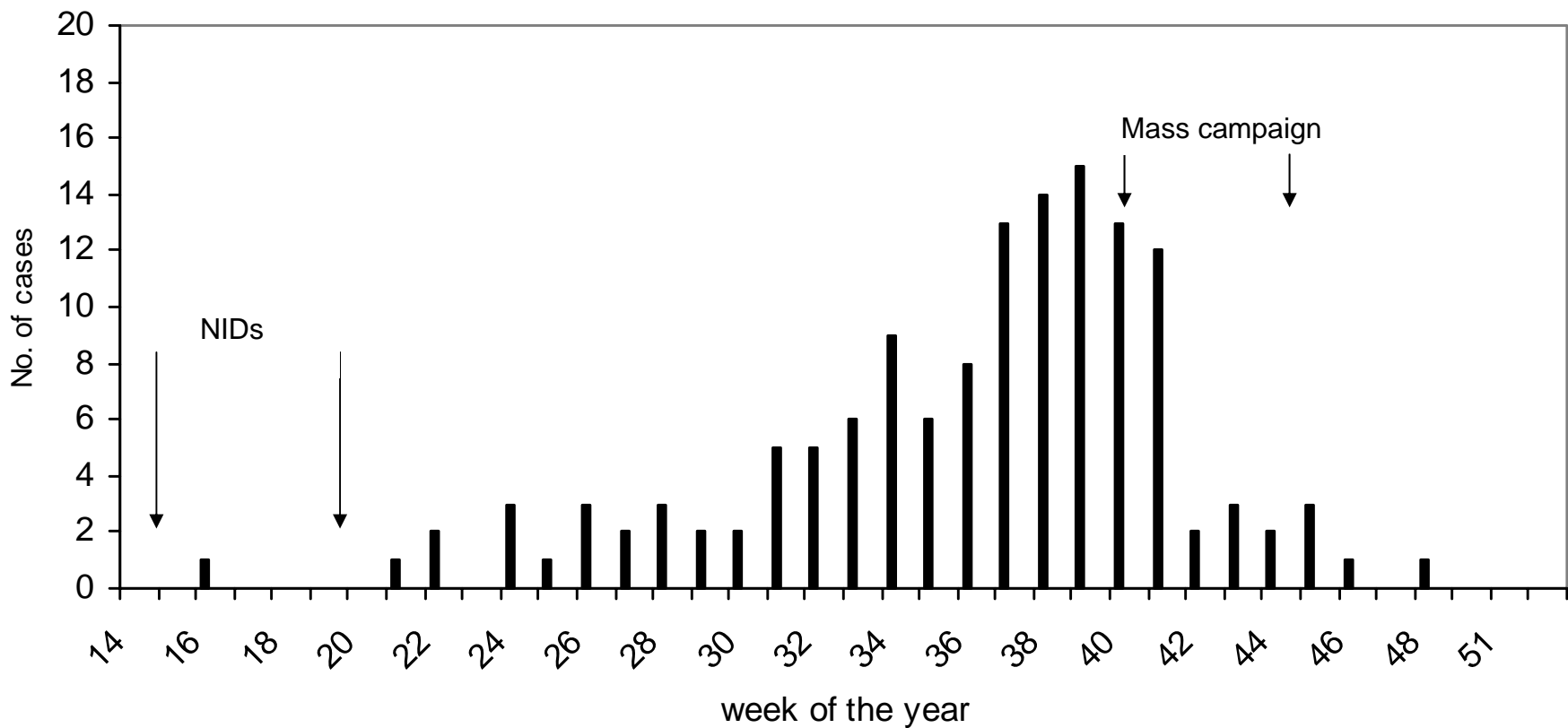


# Casi di poliomielite e copertura vaccinale per OPV3 Albania, 1960-1995

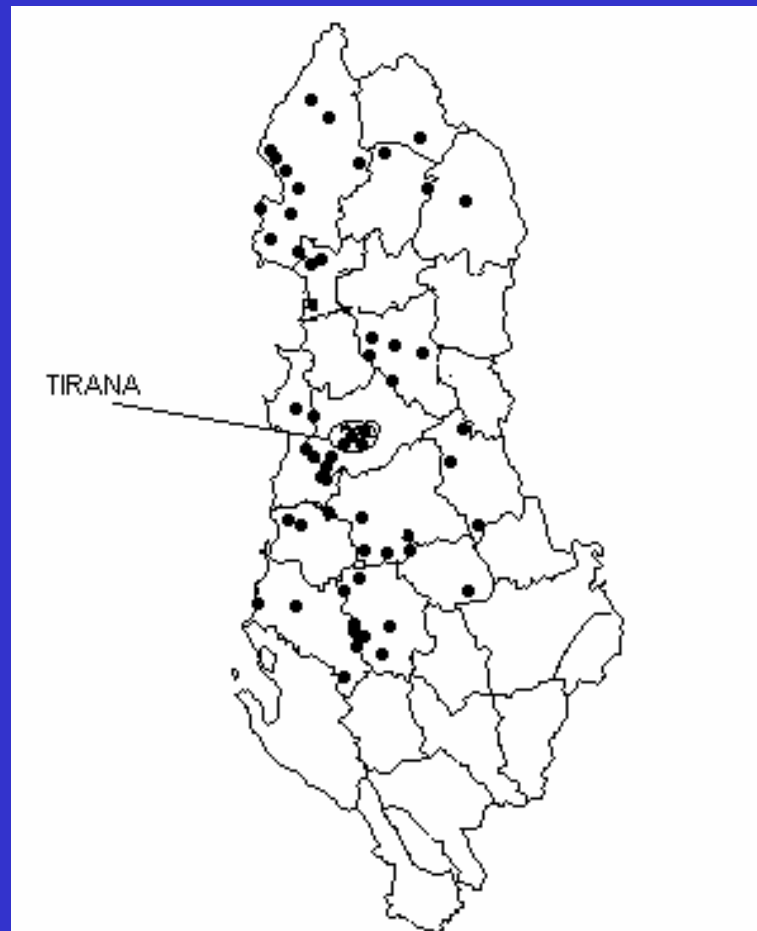


# Casi di poliomielite paralitica per settimana

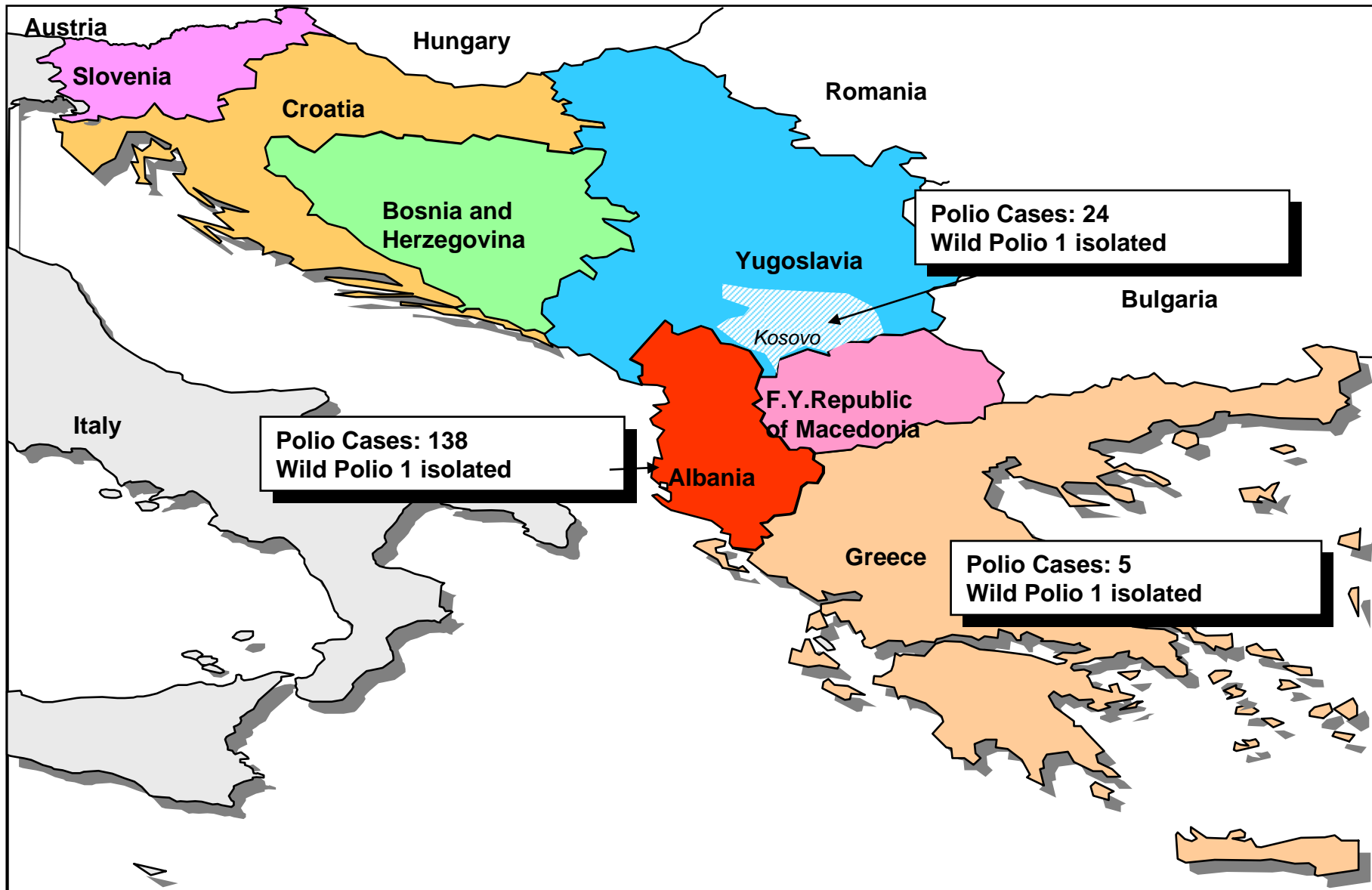
## Albania, aprile-novembre 1996



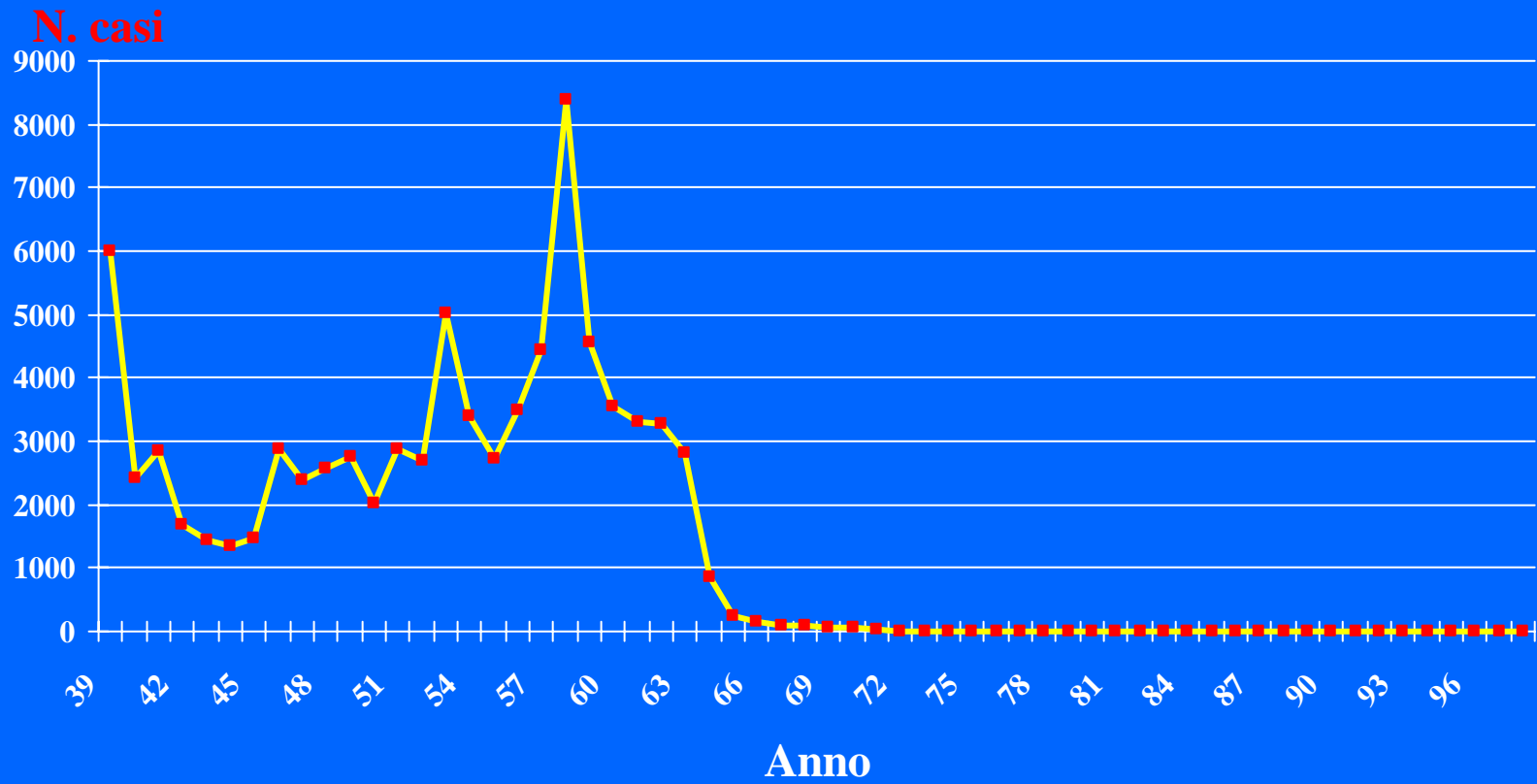
# Distribuzione geografica dei casi di poliomielite paralitica Albania, aprile-novembre 1996



# Casi di poliomielite paralitica nei Balcani Aprile - Dicembre 1996

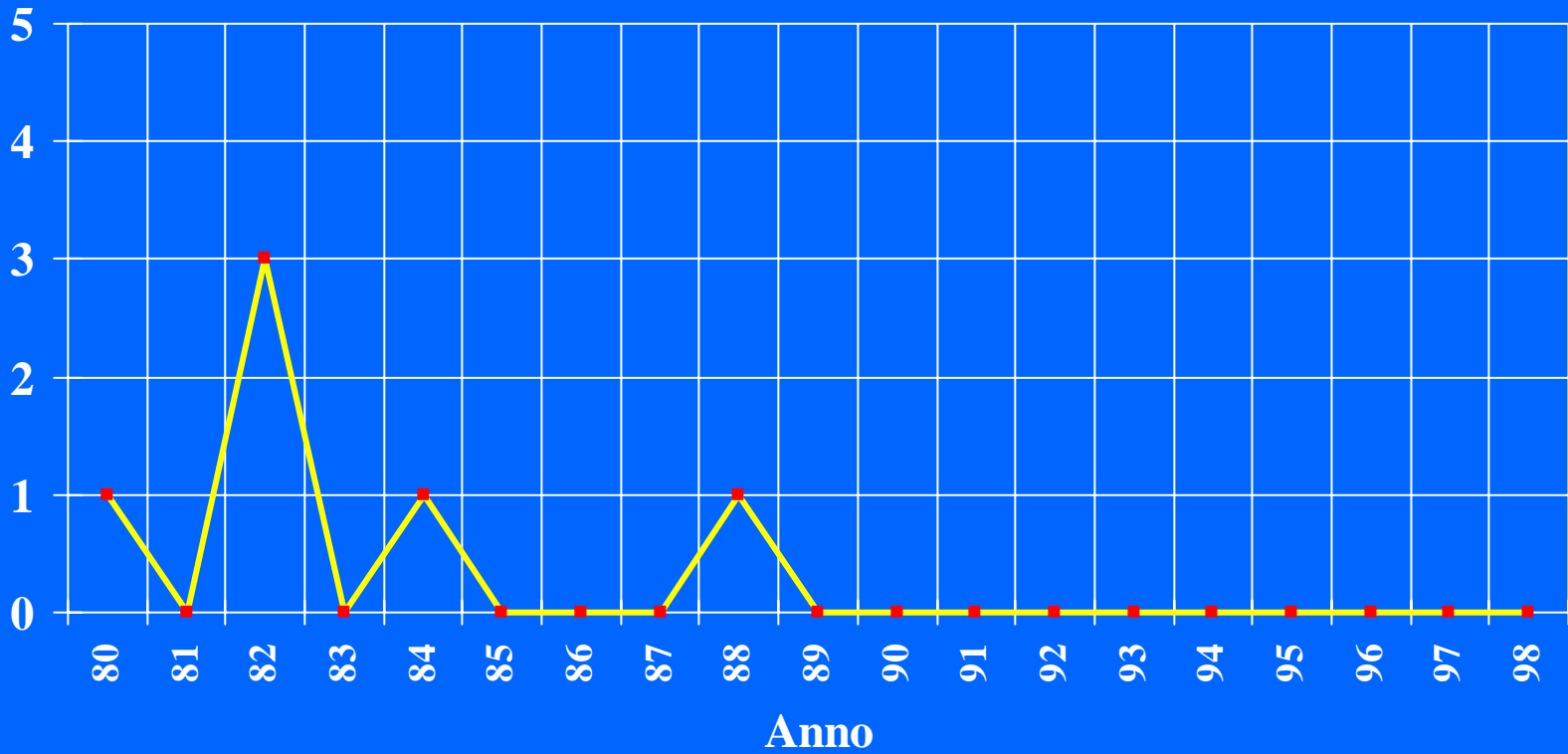


# *Poliomielite*

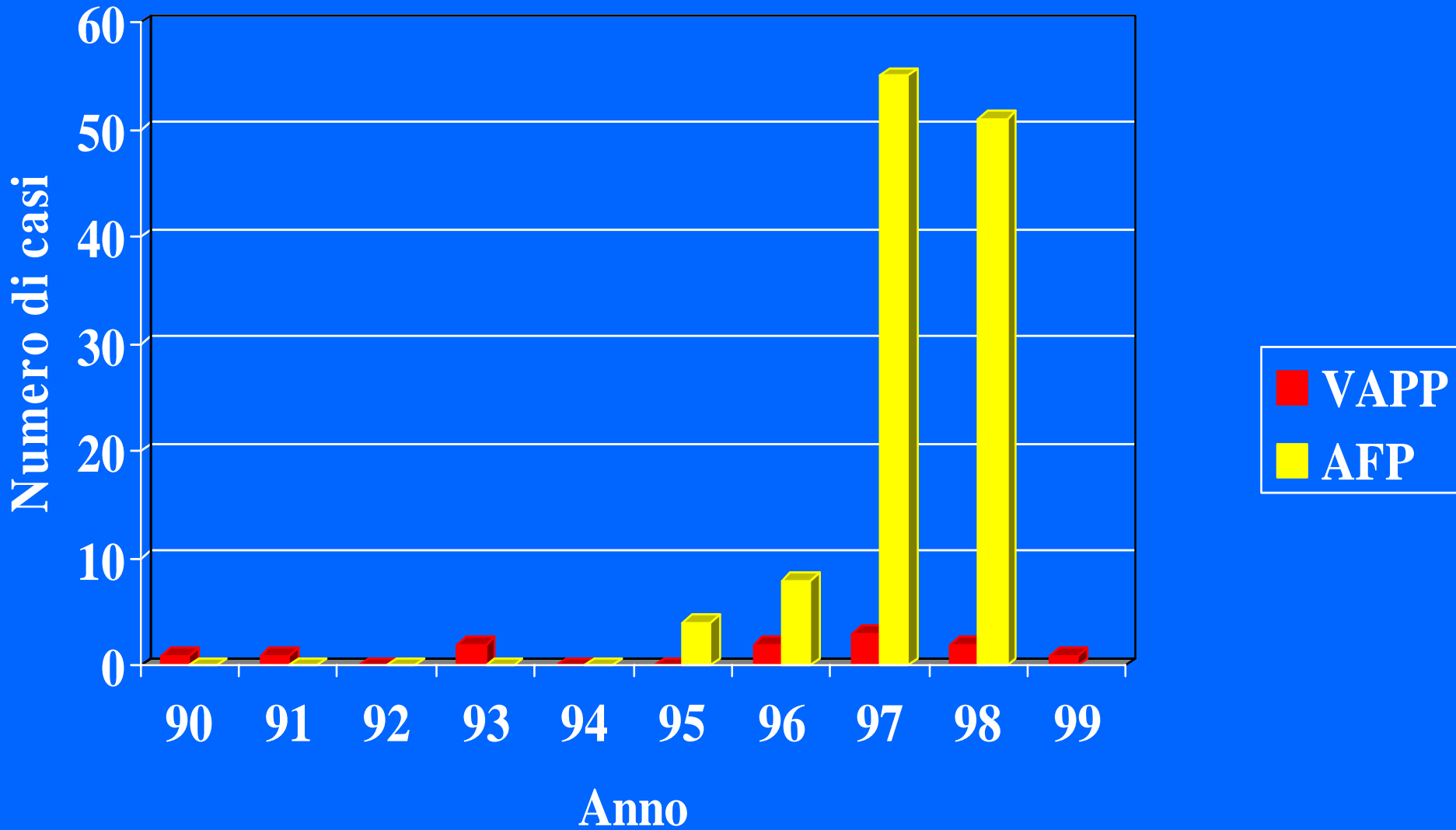


# *Poliomielite*

N. casi



# Casi di VAPP e AFP in Italia



# **Acute Flaccid Paralysis (AFP): Surveillance Standard for Certification**

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## **Situation Analysis in the European Region**

**November 1999**





**In addition to finding poliovirus if it is circulating, the BIG Question answered by *AFP surveillance* is:**



*How can we be certain that there is no wild poliovirus in a country which reports 'zero' cases of polio?*



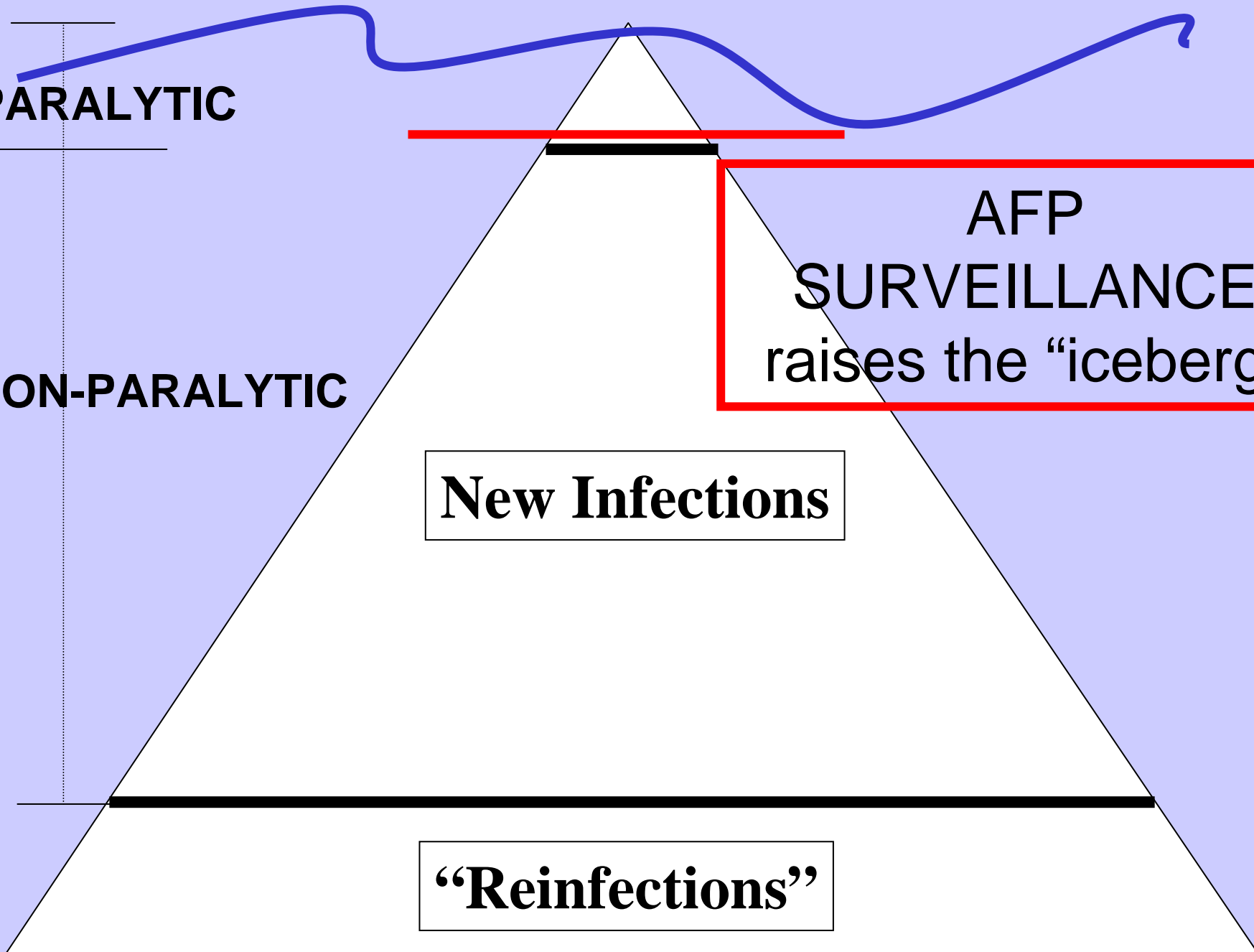
**PARALYTIC**

**NON-PARALYTIC**

**AFP  
SURVEILLANCE  
raises the "iceberg"**

**New Infections**

**"Reinfections"**



# HOW?

## **AFP SURVEILLANCE** **The Process**

Onset of paralysis

↓ **≤ 7 days of onset**

Detection & notification

↓ **≤ 14 days of onset**

Case investigation & specimen collection

→ **≤ 3 days of being sent**

Specimens arrive at national lab

↘ **≤ 28 days**

Primary culture results reported to EPI

Isolates sent to regional lab for intra-typic differentiation



Intra-typic differentiation results reported to EPI

↓ **≥ 60 days of onset**

Follow-up exam



**Classification of case (≤ 12 weeks of onset)**



# WHAT?

## AFP Case Definition

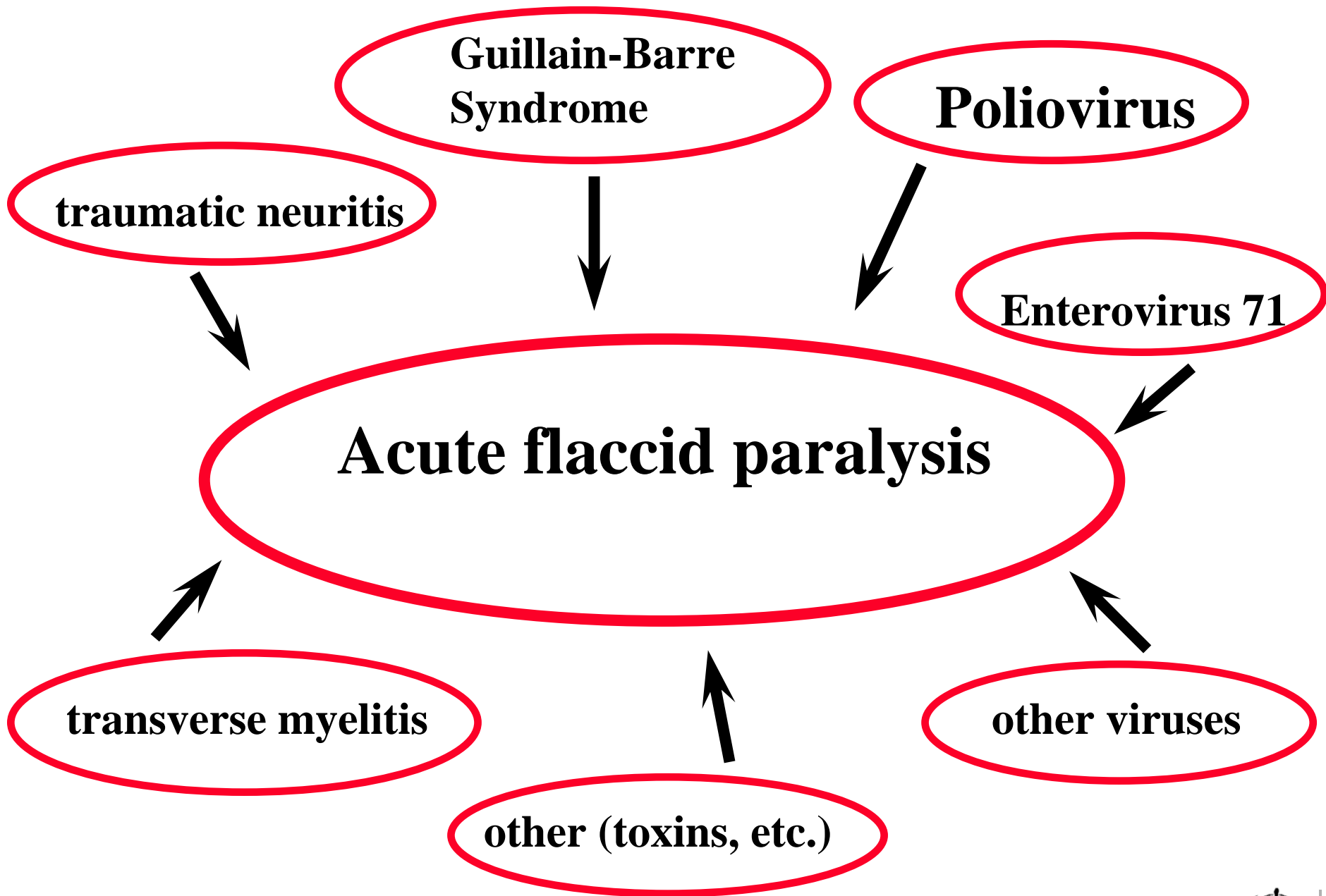
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AFP:

Any case of flaccid paralysis of acute onset in a child aged less than 15 years of age;

Clinically suspected polio at any age





# AFP Surveillance Performance Indicators

## *System Sensitivity*






 **Non-polio AFP rate in children < 15 years of age**  
**Objective:  $\geq 1 / 100\ 000$**

 **Geographic areas representative of population**  
**Objective:  $\geq ALL$**



# AFP Surveillance Performance Indicators

## *Reporting and Investigation Operations*

-  **Completeness: % of all expected AFP weekly reports received**  
**Objective: 90%**
-  **Timeliness: % of all expected AFP weekly reports received by deadline**  
**Objective: 90%**
-  **Investigation  $\leq$  48 hours of report**  
**Objective:  $\geq$  80%**
-  **2 stools collected  $\leq$  14 days of paralysis onset ( $\geq$  24 hrs apart)**  
**Objective:  $\geq$  80%**
-  **Living patient with follow-up at 60 days for residual paralysis**  
**Objective:  $\geq$  80%**



# *OPV vs IPV*

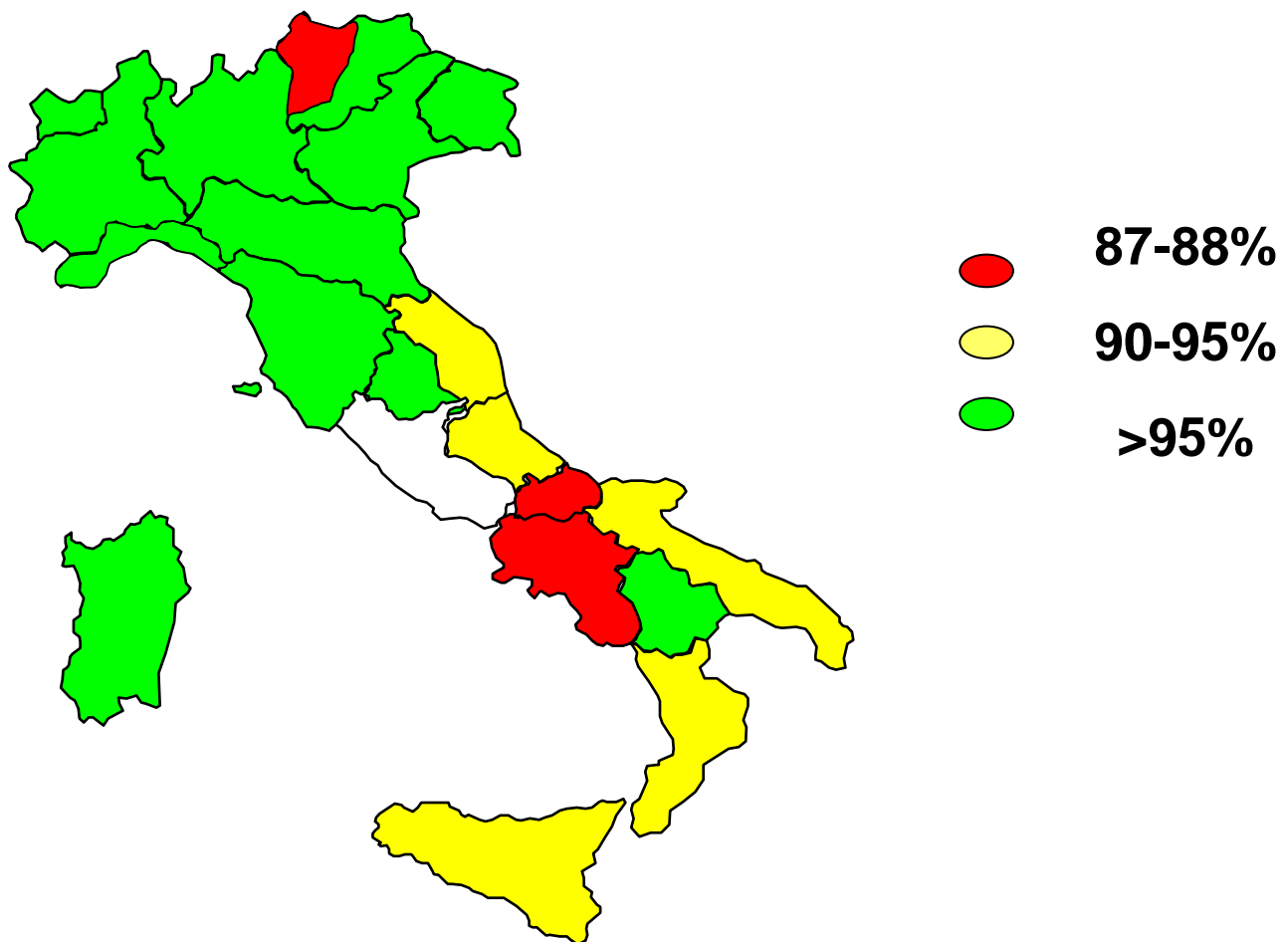
	OPV	IPV
AFP	Si	No
Immunità mucosale	Si	No
Virus shedding	Si	No
Efficacia	>95%	>95%



# *Frequenza di VAPP dopo OPV*

- 1:760.000 prime dosi
- 1:1.5-2.2 milioni dosi successive
- In 3 anni circa 3 milioni di OPV somministrate (3e e 4e dosi)
- N. di VAPP attese = 1

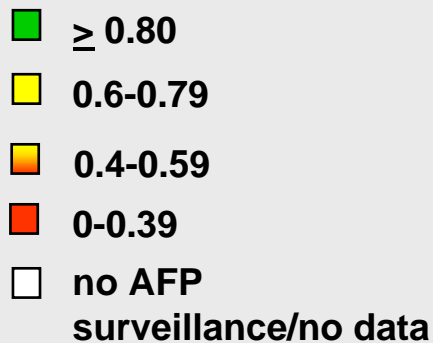
# Copertura vaccinale per polio3 entro 24 mesi



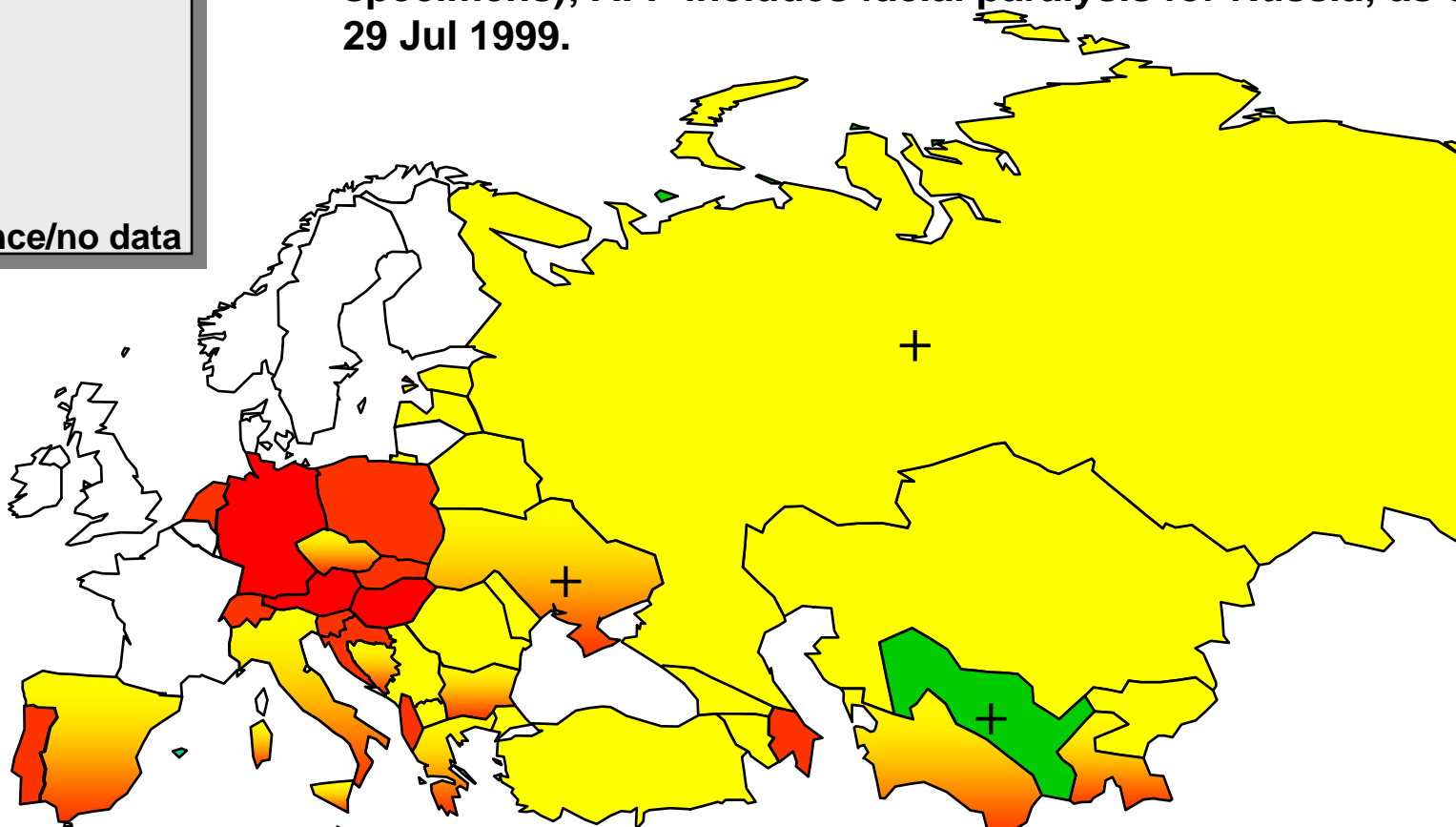
Copertura entro 12 mesi 78.6%  
Copertura entro 24 mesi 94.6%



# Index rates of non-polio AFP among Member States conducting AFP surveillance in the European Region of WHO, 1998\*



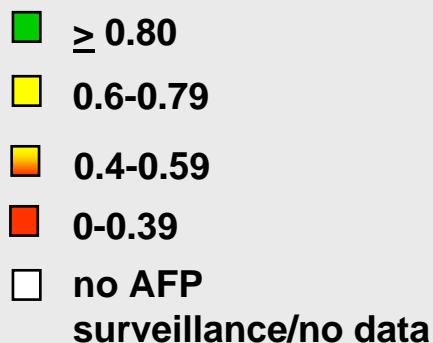
\*index=(incidence [max 1.0] x proportion with faecal specimens); AFP includes facial paralysis for Russia; as of 29 Jul 1999.



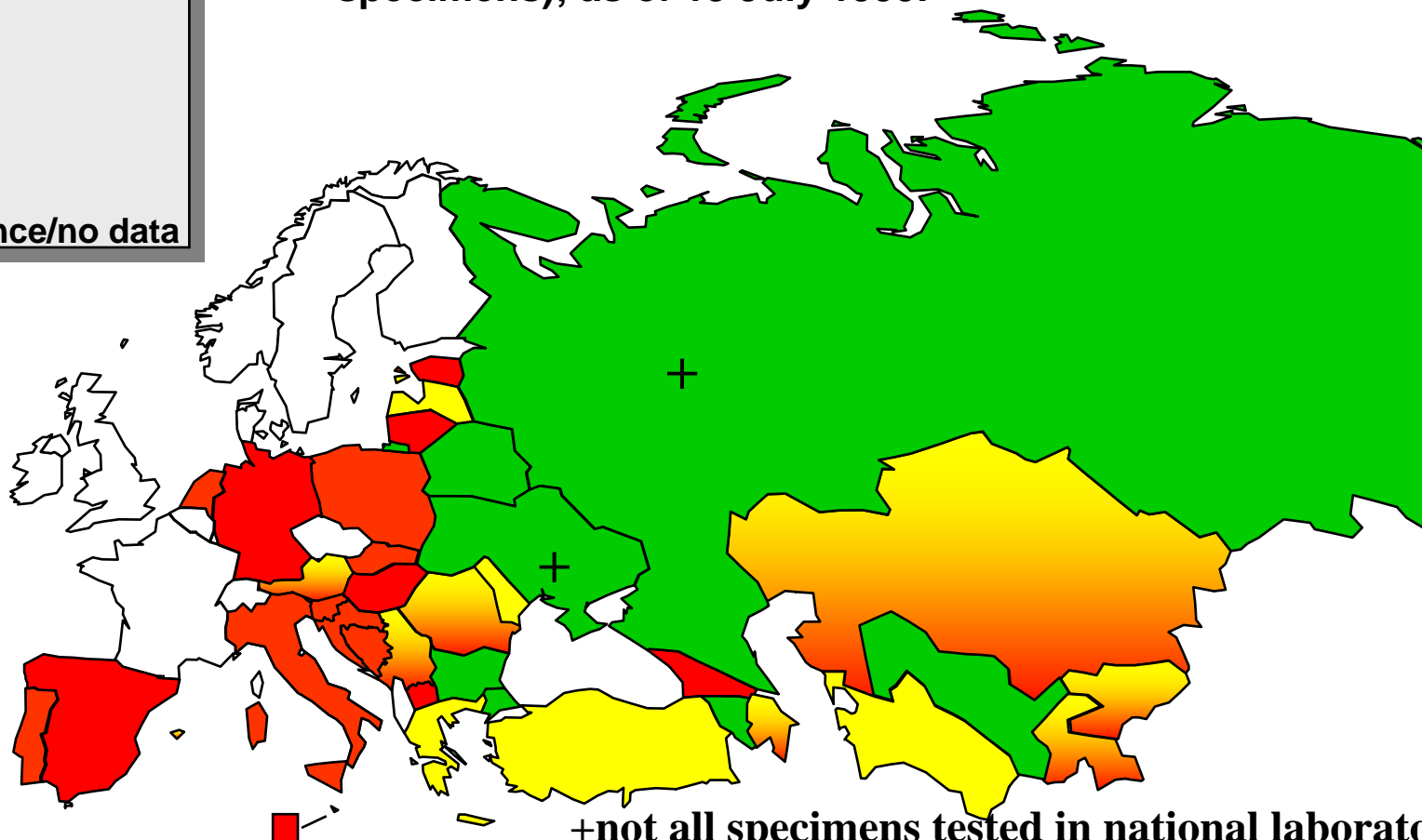
+not all specimens tested in national laboratory



# Index rates of non-polio AFP among Member States conducting AFP surveillance in the European Region of WHO, 1999\*



\*index=(incidence [max 1.0] x proportion with faecal specimens); as of 13 July 1999.



+not all specimens tested in national laboratory



# Sorveglianza della AFP in Italia

1999		2000	
AFP r	% St	AFP r	% St
0,50	54	0,36	67
2001			
AFP r	% St		
0,45	60		

## Quale calendario ?

- 1998 ultimo caso di polio in Europa
- 2001 certificazione ottenuta in Europa
- 2002 ultimo caso nel mondo
- 2005 certificazione raggiunta nel mondo
- 2010 Si ferma la vaccinazione antipolio

Questo significa

Avere a che fare con le  
vaccinazioni antipolio

per i prossimi :

10 anni !!!

# “Hot” AFP case – Burgas, Bulgaria, 2001, background, response and timeline of actions taken / 1

- 20-Mar unvaccinated 13-month-old female gypsy child in Burgas district became ill with fever and vomiting
- 21-Mar child was hospitalised with diagnoses of tonsillitis and ketosis
- 24-Mar paralysis onset left leg, child transferred to infectious disease ward
- 24-Mar case notified to epidemiological unit
- 24-Mar first faecal specimen taken (Or 26, conflicting info)
- 25-Mar second faecal specimen taken (Or 27, conflicting info)
- 14-Apr AFP case notified to WHO / EURO via CISID
- 17-Apr polio type 1 isolated by national laboratory
- 17-Apr specimens sent to RRL Paris for ITD
- 19-Apr MOH initiated mass vaccination campaign in Burgas (2500 children received OPV locally; regional target group 17,000)



# “Hot” AFP case – Burgas, Bulgaria, 2001, background, response and timeline of actions taken / 2

- 23-Apr official letter of notification of suspect polio case from MOH to WHO/EURO
- 24-Apr EURO action: country telephone contact, rec: enhanced surveillance
- 23-Apr EURO action: RRL Paris was alerted, specimens sent to RRL/Rome for ITD
- 23-Apr EURO action: HQ informed
- 24-Apr EURO action: steps taken to secure 1.2 million OPV doses for NID
- 25-Apr RRL/Paris, started monoclonal Ab assay
- 26-Apr Samples arrived at RRL/Rome and immediately processed in ELISA
- 26-Apr RRL/Rome started amplification of the virus
- 26-Apr RRL/Rome started sequencing of the virus
- 26-Apr 2 methods of ITD completed (ELISA-Rome and monoclonals-Paris)
- 26-Apr RRL/Rome PCR interpreted as Sabin strain
- 27-Apr RRL/Rome repeat PCR and sequencing indicated non Sabin-like
- 28-Apr EURO action: sequence findings sent for follow-up to CDC
- 28-Apr CDC database indicates likely northern India origin (96.9% homology with 1999 isolate)

Grazie per la pazienza !!

Il mio indirizzo è :

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**Arrivederci !**