

# **Introduction**

AFP surveillance up to 1999 was passive surveillance. The activities were depending only on cases referred from clinical units passively for lab investigation. At the beginning of the year 2000 WHO made tremendous inputs to establish an efficient system and thus provided transport means, working tools, communication, supplies & equipment's, staff and running costs.

AFP surveillance in Sudan has reached and maintained certification level quality indicators since the beginning of 2001, and shifted to the virological classification since the beginning of 2001.

Different reviewers (nationals and internationals) confirmed that the AFP surveillance system is sensitive enough to detect any transmission or importation of wild poliovirus in Sudan. This was further confirmed when the system efficiently picked the imported Nigerian/ Chad virus in Forbrunga; a remote and insecure town in West Darfur state, in May 2004. Further more a new importation was detected in time this year on 10/9/2007, in Sheria Locality of South Darfur, thus enabling timely response.

This is the annual technical report for the year 2007. The contents of the report include results, analysis, and interpretations of the AFP surveillance data for Sudan. It also includes background information about the surveillance system in the country and the main activities conducted by the central unit.

The improvement of the system as reflected by the high quality performance indicators is very clear.

The first draft certification document was accepted by the RCC in Oct. 2003. Also annual updates were prepared and forwarded to EMRO for consideration by the RCC. This was resubmitted for the regional RCC for the year 2006 since the imported virus was eliminated, the last case being reported in May 2005.

An annual update for 2006 was written and forwarded to the regional RCC in March 2007 and another annual update for the year 2007 is ready now to be submitted to the RCC on 7<sup>th</sup> of March 2008.

During 2005, 2006 and 2007 the system is implementing community surveillance and expanding the zero reporting sites aiming at more perfection particularly for remote population groups and nomads. During 2007 zero reporting was expanded and the preparedness plan for picking importations and containing them was implemented vigorously and was reviewed during the annual meeting.

Integration of measles and NNT surveillance was started since 2003 and by the end of 2006 it is fully integrated in the system and continuous improvements were implemented.

## **BACKGROUND INFORMATION**

Sudan lies in the center of Africa and has borders with nine countries namely Egypt, Libya, Chad, Central Africa, Uganda, Zaire, Kenya, Ethiopia and Eritrea. The border tribes often have the same families and other socio-economical ties that there is a continuous movement across the borders. This movement had affected the health situation through a long history and currently is having a great impact on the spread of diseases in the country.

The area of Sudan is 2.5 million square kilometers, making it the largest country in Africa.

The climate ranges from desert in the north, extending south through semi desert, poor savannah, savannah, rich savannah and ending into rainy equatorial forests in the south. This affects types and persistence of diseases in the country. The population is estimated to be 34 512 000, with an under 15 years population of about 14 769 566. About 35% of the populations are urban, 63% rural and 2% nomads.

Administratively, the country is divided into 25 states. There are 15 states in the north and these are divided into 135 localities.

For AFP/Measles/NNT surveillance purposes the table below shows the name of each state, the code used for surveillance purposes, the number of localities in that state and the under 15 years population.

## **POLIO ERADICATION IN SUDAN**

Sudan started its efforts to eradicate poliomyelitis in 1994. EPI is the responsible body to carry out the activities of the program in the country. After the peace arrangement the AFP surveillance activities are conducted by WHO in South Sudan (10 states).

The program has adopted 4 strategies:

- Boosting the routine immunization.
- Conducting supplementary immunization activities ( SIAs).
- Conducting AFP surveillance, to the required certification level.
- Effectively respond to and contain importation of wild poliovirus.

## **AFP SURVEILLANCE IN 2008**

### **ORGANIZATION:**

Diagram in the next page shows the organization of AFP surveillance at national and states level. It also indicates the relation between the program, WHO, UNICEF and different committees.

### **STAFF:**

19 surveillance officers are posted through out the northern states of the country assisted by 4 WHO/STCs and 9 NMO holding WHO/SSA to oversee a surveillance network involving 308 reporting sites plus 158 additional zero reporting sites, including health care institutions, private clinics, special population groups (nomads, IDPs camps in rebels areas, ...etc) and traditional healers.

### **TRANSPORT & COMMUNICATION:**

44 cars, 68 motorcycles, 45 bicycles are providing an efficient network for transportation. In each states fax and telephone services were made available. Some cars were provided with radio sets.

### **REPORTING SITES:**

Reporting sites in North SUDAN during 2007 were :

- 105 high priority sites – mainly pediatric and specialized hospitals
- 111 medium priority sites – busy hospital and health centre
- 100 low priority sites – other less busy facilities and traditional healers
- 158 Additional zero-reporting sites.

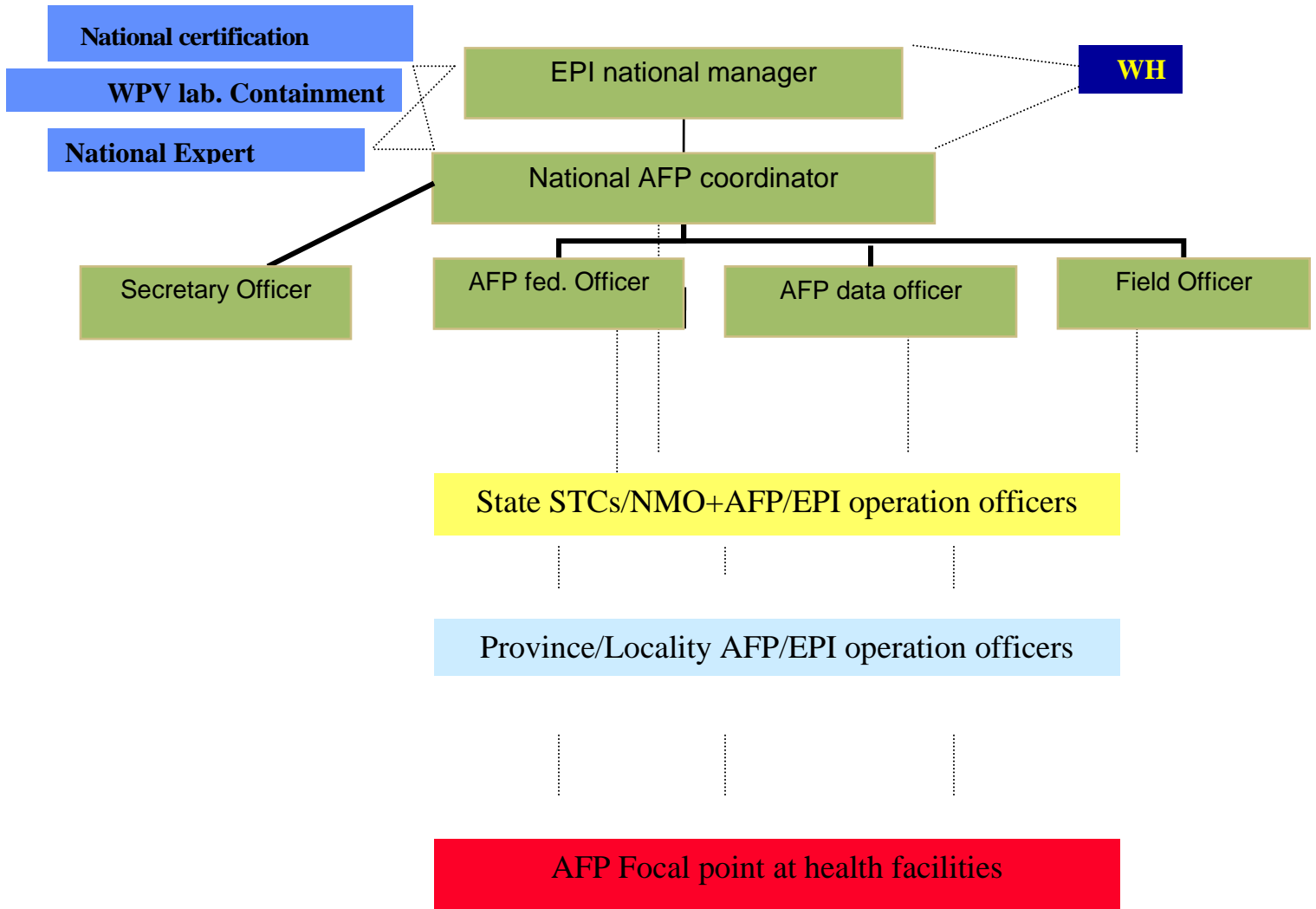
The 308 sites include: 278 public Institutions, 19 private clinics, and 11 traditional Healer places.

The zero reporting sites were expanded by 158 new sites to report weekly without other activities of surveillance.

### **Early Preparedness for Importation:**

Plans for early preparedness for picking any importation and containing it were up-dated for each state and put into real implementation by the states authorities. Situation of implementation of these plans was reviewed during the EPI annual meeting.

# AFP surveillance structure



## **AFP SURVEILLANCE MAIN INDICATORS IN 2008**

### **NON-POLIO AFP RATE:**

The global standard for any population the Non-polio AFP rate is one per 100 000 under 15 years children. For Sudan it was suggested by the TAG to aim at 2 or more because of the high occurrence of malaria and meningitis.

The expected number of AFP cases for 2007 for north Sudan was 138, and during the year 362 cases had been reported This gives a rate of 2.6 cases per 100 000 under 15 years children. 1 Compatible cases from white Nile state (kosti localitiy) and two wild polio imported cases from West Darfur state ( Alginaina / Habila localits,). (see table 3)

When looking to the data from north Sudan (table3) all of the 15 states reported a rate of above 2.

### **ADEQUATE STOOL SAMPLES:**

Adequate specimens are defined as " two stool specimens collected from a case, at least 24 hours apart within 14 days of paralysis onset: each specimen must be of adequate volume (8 – 10 grams) and arrive in the National Polio Laboratory in "good" condition". Good condition; is defined as no desiccation, no leakage, adequate documentation and evidence that the reverse cold chain was maintained. The global standard is that 80% of AFP cases should have adequate stool samples.

97% of the 362 cases had adequate stool specimens. All stool samples arriving at the laboratory in good condition was 100%.

Stool samples adequacy rate was 100% in nine states, between 80% - 99% in 5 states, And only White Nile States less than 80% (Table 8, & Map 2).

### **REPORTING AND INVESTIGATION:**

The objective of the AFP surveillance is to notify cases within 7 days from date of onset, investigate 80% of AFP cases within 48 hours of being notified and 80% of Stool specimens arriving at the lab < 3 days of being sent.

During 2008 AFP cases notified within 7 days were 85%, AFP cases investigated within 48 hours of being notified was 99%, stool samples arriving the laboratory within 3 days of being collected 71% and of being sent was 99% (table 7).

## **NON-POLIO ENTEROVIRUS:**

The non-polio entero-viruses detection rate among all stool samples was 14% with random distribution over the country (Table 8 & Map 5).

## **SPECIMENS RESULTS TURN ROUND TIME:**

The laboratory results received from the National Polio Lab. by the EPI within 28 days from samples being received was of a rate of 99.6 %, while the required standard is 80%. (Table 5).

## **WEEKLY (ZERO) REPORTING:**

The completeness of weekly (zero) reporting was 99.7 % from high priority sites, 98% from medium priority sites and 97.6 % from low priority sites. (Table No 14 & Figure 11).show completeness and timeliness by states.

## **ACTIVE SURVEILLANCE VISITS:**

The completeness of active AFP/Measles surveillance visits for the high priority sites was 99.8 %, for medium priority sites was 97 % and for low priority sites was 95.5 % (table 15 & figure 12).

## **DIAGNOSIS OF AFP CASES**

A list of 23 diseases and conditions were classified as causes of AFP. GBS was one of the main causes of AFP cases (42 %). Complicated malaria cases was 15 %. Traumatic neuritis 9 %, meningo encephalitis 12 % and Child-hood hemiplegia caused 7 %, transverse myelitis 3 %, NPEV myelitis 0.5 %, hypokalaemia 3 %, Anaemia 2 %, arthritis 1 %, diphtheria 0.2 %, ataxia 0.2 %, CVA 0.5 %, osteomyelitis 0.2 %, Todds paralysis 0.2 %, and 0.2 for diarrhea, Hypgirdle sy., potts disease, pneumonia, stroke and myositis.(table 12) .

## **SUMMARY OF AFP SURVEILLANCE CENTRAL UNIT ACTIVITIES**

Here are the main activities conducted by the Central unit regarding supervisory visits, IEC materials, meetings and workshops, training and orientation. ect.

### **SUPERVISORY VISITS:**

Supervisory visits were conducted from the CU to the peripheral levels during 2007. The states visited were Gezira , Gedarif, Kassala, Sennar, River Nile, Khartoum, North Kordofan, and Northern states.

### **MEETINGS AND WORKSHOPS:**

During the year 2007 AFP surveillance Central Unit had participate actively in many meetings and workshops, mainly:

- Four AFP surveillance national expert committee meetings. The committee had review 25 cases, all of them were discarded except two compatible cases from Gezira and West Darfur states.
- Four National Certification Committee meetings.
- Meetings of WHO/STC and polio NMO.
- EPI states operation officers evaluation and planning meeting.
- Participated in the weekly (Sunday, now Monday) surveillance (AFP/Measles/NNT/Advese events) meetings.
- Participation in supervision of NIDs.

### **ORIENTATION AND TRAINING:**

- Training of all newly appointed NMO, and orientation for STCs and STOP team members. In all meetings of expert committee and NCC orientation on polio eradication situation, the AFP surveillance activities and performance was done.
- Re-training for field staff during the annual planning and evaluation meeting for 2007/2007.

### **IEC Materials, Newsletter and Working Forms:**

- Four issues of quarterly news letter (Sharh) were produced, 800 copies of each distributed timely to partners and lower level as feed back.
- Reprinting and distribution of needed posters and working tables & forms.
- Distribution of the IEC materials to the states (leaflets & dear citizen).

STATES	STATE CODE	High priority	Medium priority	Low priority	Total
Blue Nile	BNI	5	4	4	13
Gedarif	GED	7	9	4	20
Gezira	GEZ	12	7	11	30
Kassala	KAS	5	4	7	16
Khartoum	KHA	20	32	5	57
North Darfur	NDA	3	6	3	12
North Kordofan	NKO	6	5	5	16
Northern	NOR	6	6	11	23
Red Sea	RED	3	12	11	26
River Nile	RNI	6	4	9	19
Sennar	SEN	5	2	6	13
South Darfur	SDA	8	6	2	16
South West Kordofan	SWKO	7	4	4	15
South East Kordofan	SEKO	4	1	4	9
West Darfur	WDA	3	3	8	14
White Nile	WNI	5	6	7	18
TOTAL	SUD	105	111	100	316

(Table – 2)

NORTH SUDAN / States code, No Localities, Population < 15 years ,Expected AFP Cases 2008

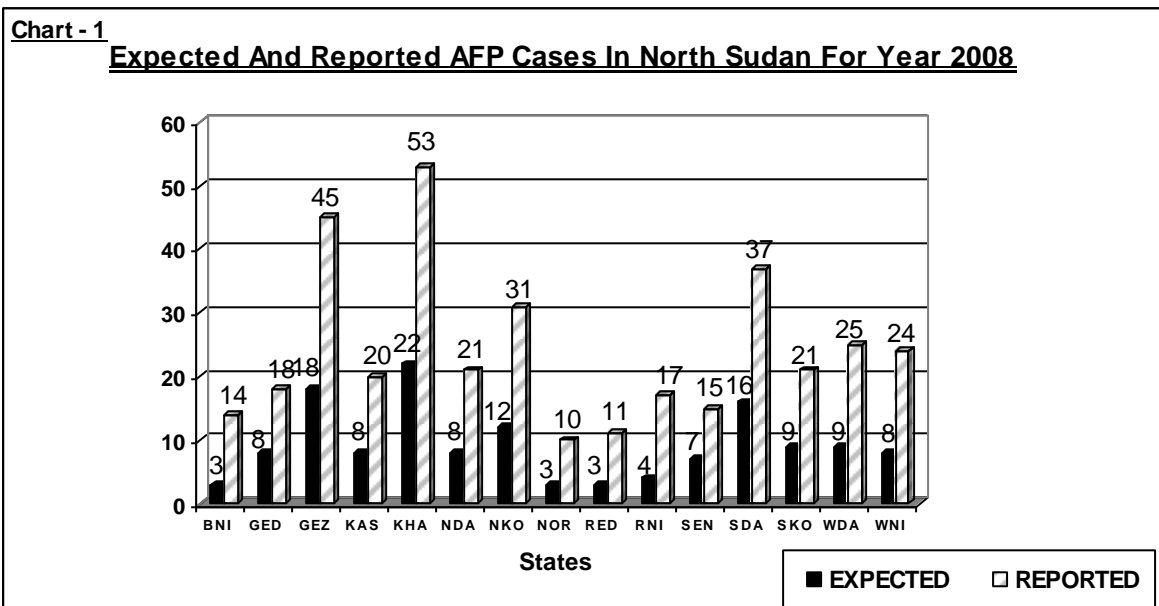
STATES	STATE CODE	Localities	Population <15 year	Expected NO. OF AFP CASES
Blue Nile	BNI	6	345141	3
Gedarif	GED	9	807992	8
Gezira	GEZ	7	1818206	18
Kassala	KAS	11	795748	8
Khartoum	KHA	7	2234046	22
North Darfur	NDA	12	810981	8
North Kordofan	NKO	9	1224747	12
Northern	NOR	7	259007	3
Red Sea	RED	10	328047	3
River Nile	RNI	6	445463	4
Sennar	SEN	7	682468	7
South Darfur	SDA	12	1633786	16
South Kordofan	SKO	9	934811	9
West Darfur	WDA	13	905704	9
White Nile	WNI	8	794818	8
TOTAL	SUD	133	14020955	138

(Table – 3)

Expected number of AFP and reported AFP cases and final classification

For year 2008 ( North Sudan)

STATES	EXP	AFP	CLASSIFICATION			NON-POLIO AFP RATE
			Confirmed ( Wild )	Compatible	Discarded	
BLUE NILE	3	14	0	0	14	4.7
GEDARIF	8	18	0	0	18	2.3
GEZIRA	18	45	0	0	45	2.5
KASSALA	8	20	0	0	20	2.5
KHARTOUM	22	53	0	0	53	2.4
NORTH DARFUR	8	21	0	0	21	2.6
NORTH KORDOFAN	12	31	0	0	31	2.6
NORTHERN	3	10	0	0	10	3.3
RED SEA	3	11	0	0	11	3.7
RIVER NILE	4	17	0	0	17	4.3
SENNAR	7	15	0	0	15	2.1
SOUTH DARFUR	16	37	0	0	37	2.3
SOUTH KORDOFAN	9	21	0	0	21	2.3
WEST DARFUR	9	25	2	0	23	2.6
WHITE NILE	8	24	0	1	23	2.9
<b>TOTAL</b>	<b>138</b>	<b>362</b>	<b>2</b>	<b>1</b>	<b>359</b>	<b>2.6</b>

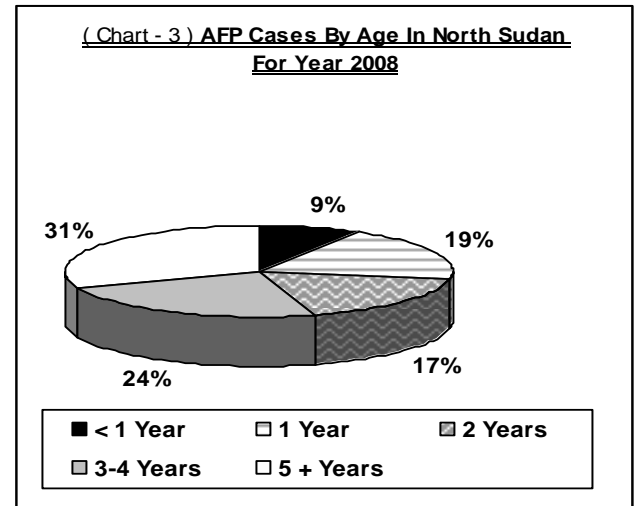
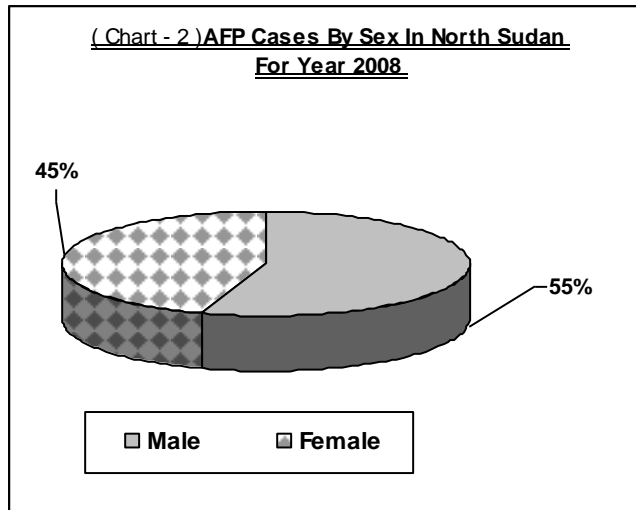


( Table - 4 )

**AFP Cases By AGE And Sex In North Sudan For Year 2008**

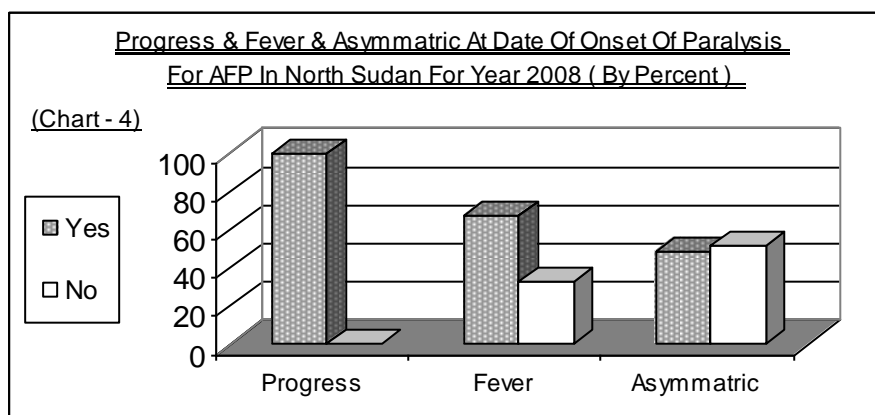
Age Group	Male	Female
-----------	------	--------

<1 Year	20 (65%)	11 (35%)
1 Year	38 (54%)	32 (46%)
2 Years	32 (51%)	31 (51%)
3 – 4 Years	44 (51%)	42 (49%)
5 + Years	65 (49%)	47 (42%)
Total	199 (55%)	163 (45%)



( Table – 5 )  
Progress & Fever & Asymmatric At Onset Of Paralysis  
For AFP Cases In North Sudan / Year 2008

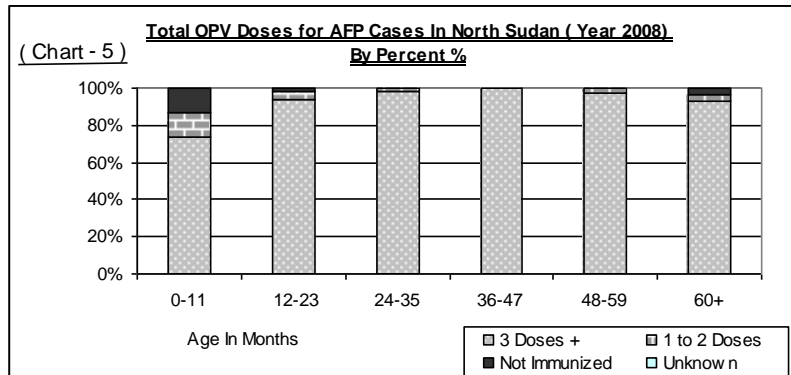
Type	Yes	No
Progress	100%	0
Fever	67%	33%
Asymmatric	48%	52%



(Table – 6-A )  
Total doses of AFP cases by age in months (Routine & Additional )2008

Age in months	AFP	3 dose +	1 to 2 Doses	not immunized	Unknown
0 - 11	31	74%	13%	13%	0
12 - 23	70	94%	4%	2%	0

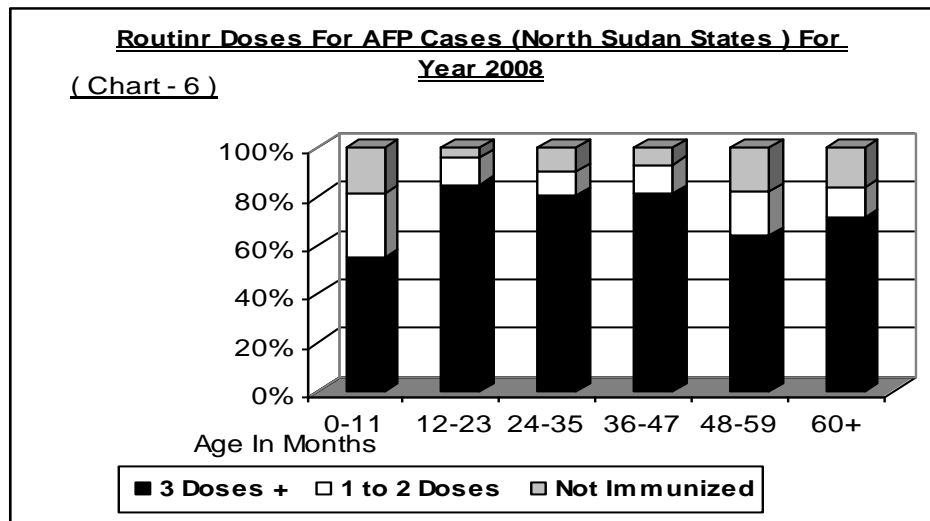
24 - 35	63	98%	2%	0	0
36 - 47	52	100%	0	0	0
48 - 59	34	97%	3%	0	0
60 +	112	90%	4%	3%	3%
<b>Total</b>	<b>362</b>	<b>93%</b>	<b>4%</b>	<b>2%</b>	<b>1%</b>



(Table – 6-B)

**Routine Doses of AFP cases by age in months 2008**

Age in months	AFP	Complete	Partially	not immunized	Unknown
0 - 11	31	55%	26%	19%	0
12 - 23	70	84%	11%	4%	0
24 - 35	63	80%	10%	10%	0
36 - 47	52	81%	12%	7%	0
48 - 59	34	64%	18%	18%	0
60 +	112	70%	12%	16%	2%
<b>Total</b>	<b>362</b>	<b>75%</b>	<b>13%</b>	<b>11%</b>	<b>1%</b>

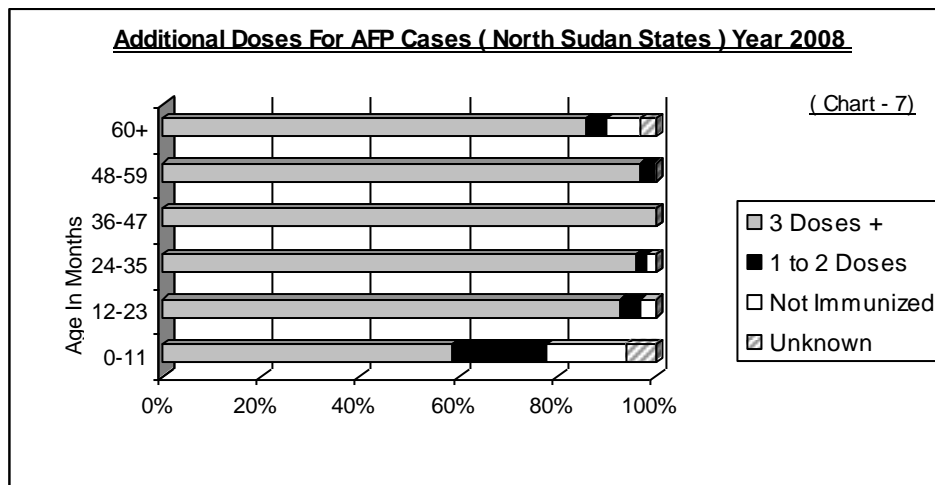


(Table – 6-C)

**Additional Doses of AFP cases by age in months 2008**

Age in months	AFP	3 doses +	1-2 doses	not immunized	Unknown
0 - 11	31	58%	19%	16%	6%
12 - 23	70	93%	4%	3%	0
24 - 35	63	96%	2%	2%	0

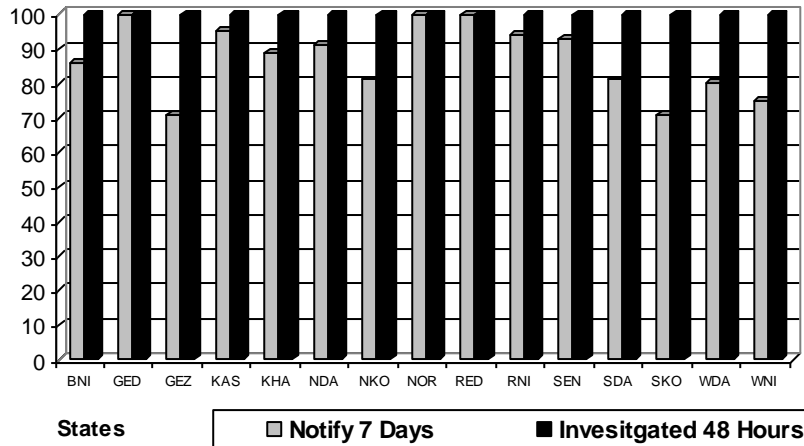
36 - 47	52	100%	0	0	0
48 - 59	34	97%	3%	0	0
60 +	112	86%	4%	7%	3%
<b>Total</b>	<b>362</b>	<b>90%</b>	<b>4%</b>	<b>4%</b>	<b>2%</b>



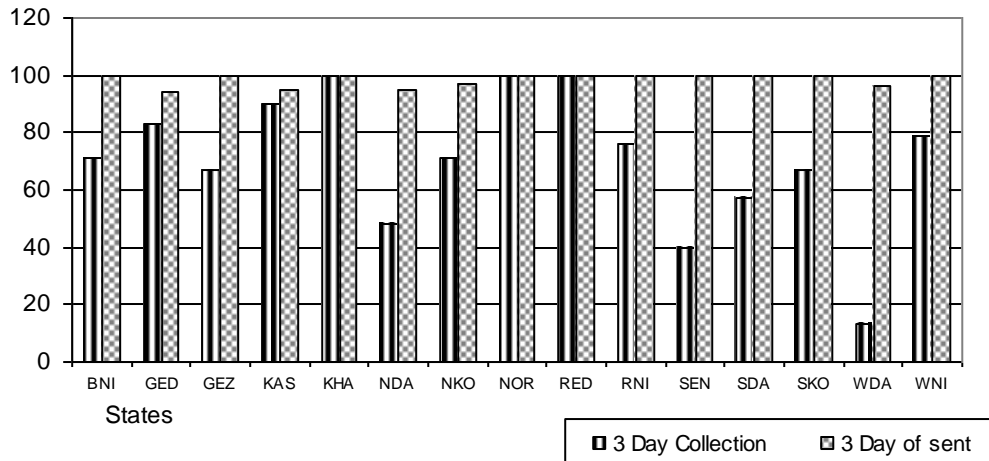
( Table - 7 )  
Main indicators of AFP cases in North Sudan for year2008

STATES	AFP Cases reported	Notify within 7 days of onset	Investigated Within 48 hours of notification	Specimens received lab within 3 days of	Specimens received lab within 3 days of sent	Follow -up 60 day of onset
BLUE NILE	14	86%	100%	71%	100%	
GEDARIF	18	100%	100%	83%	94%	
GEZIRA	45	71%	100%	67%	100%	
KASSALA	20	95%	100%	90%	95%	
KHARTOUM	53	89%	100%	100%	100%	
NORTH DARFUR	21	91%	100%	48%	95%	
NORTH KORDOFAN	31	81%	100%	71%	97%	
NORTHERN	10	100%	100%	100%	100%	
RED SEA	11	100%	100%	100%	100%	
RIVER NILE	17	94%	100%	76%	100%	
SENNAR	15	93%	93%	40%	100%	
SOUTH DARFUR	37	81%	100%	57%	100%	
SOUTH KORDOFAN	21	71%	100%	67%	100%	
WEST DARFUR	25	80%	100%	13%	96%	
WHITE NILE	24	75%	100%	79%	100%	
<b>TOTAL</b>	<b>362</b>	<b>85%</b>	<b>99.7%</b>	<b>71%</b>	<b>99%</b>	

(Chart - 8) AFP Cases Notify Within 7 Days And Investigated within 48 Hours  
In North Sudan For Year 2008( By Percent %)

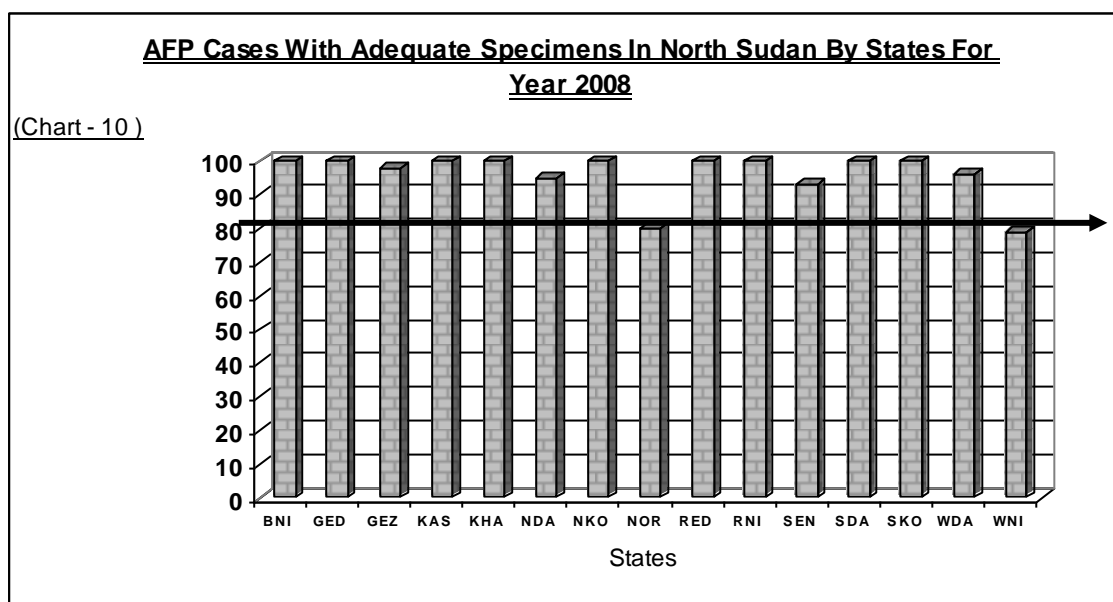


(Chart - 9) Specimens Received Lab. 3 Day Of Collection and 3 Days of Being Sent In  
North Sudan By States For Year 2008 By Percent %

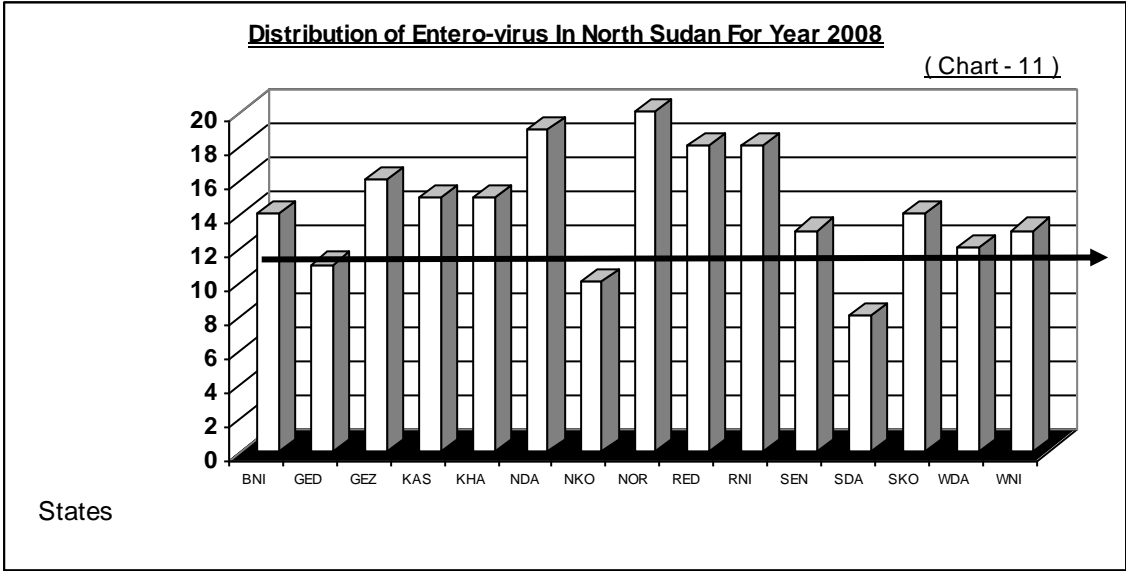


(Table – 8)

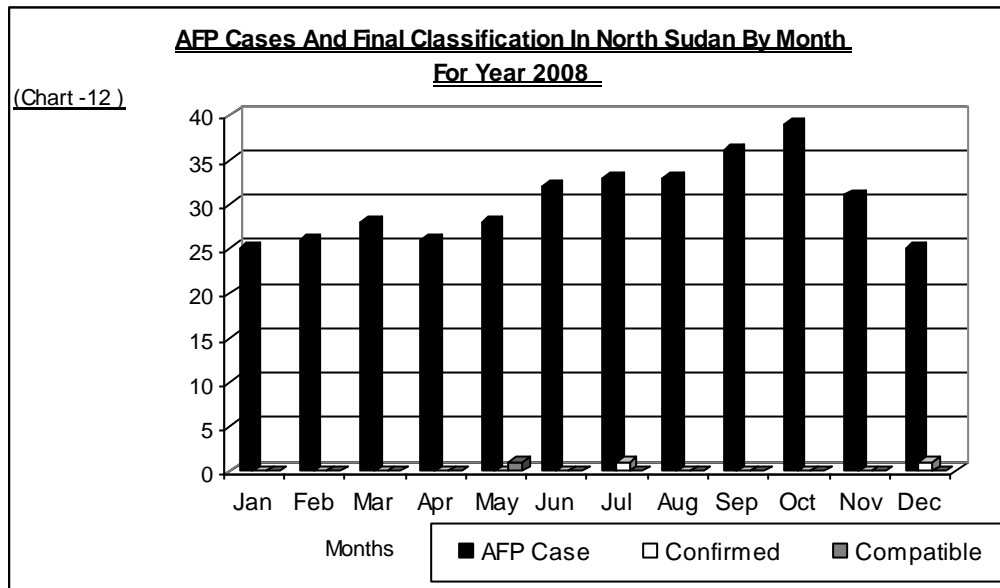
STATES	AFP Cases Reported	Cases With Adequate Specimens %	SPECIMENS			TOTAL SPECIMENS COLLECTED	Stool Condition		LAB. RESULTS		Enterovirus %
			By cases				Good	Poor	Positive	Negative	
			With 2 Specimen	With 1 Specimen	No Specimen						
BLUE NILE	14	100%	14	0	0	28	28	0	0	28	14%
GEDARIF	18	100%	18	0	0	36	36	0	0	36	11%
GEZIRA	45	98%	44	0	1	88	88	0	0	88	16%
KASSALA	20	100%	20	0	0	40	40	0	0	40	15%
KHARTOUM	53	100%	53	0	0	106	106	0	0	106	15%
NORTH DARFUR	21	95%	21	0	0	42	42	0	0	42	19%
N. KORDOFAN	31	100%	31	0	0	62	62	0	0	62	10%
NORTHERN	10	80%	8	1	1	17	17	0	0	17	20%
RED SEA	11	100%	11	0	0	22	22	0	0	22	18%
RIVER NILE	17	100%	17	0	0	34	34	0	0	34	18%
SENNAR	15	93%	15	0	0	30	30	0	0	30	13%
SOUTH DARFUR	37	100%	37	0	0	74	74	0	0	74	8%
South KORDOFAN	21	100%	21	0	0	42	42	0	0	42	14%
WEST DARFUR	25	96%	25	0	0	50	50	0	4	46	12%
WHITE NILE	24	79%	22	1	1	43	43	0	0	43	13%
<b>TOTAL</b>	<b>362</b>	<b>97%</b>	<b>357</b>	<b>2</b>	<b>3</b>	<b>714</b>	<b>714</b>	<b>0</b>	<b>4</b>	<b>710</b>	<b>14%</b>





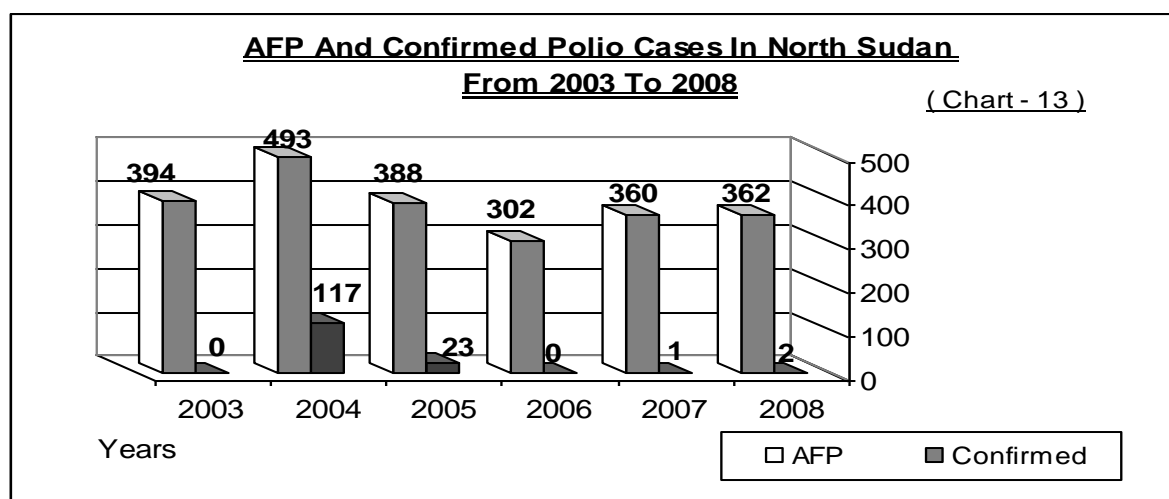


Immunization status	AFP	Classification		
		Confirmed ( Wild )	Compatible	Discarded
Completely	340	1	1	338
Partially	13	0	0	13
Not immunized	8	1	0	7
Unknown	1	0	0	1
<b>Total</b>	<b>362</b>	<b>2</b>	<b>1</b>	<b>359</b>



**AFP PERFORMANCE INDICATORS IN NORTH SUDAN 2003 - 2008**

INDICATORS	2003	2004	2005	2006	2007	2008
EXPECTED AFP CASES	143	146	149	127	133	138
REPORTED AFP CASES	394	494	388	302	360	362
CONFIRMED POLIO CASES	0	119	23	0	1	2
CASES WITH WILD POLIOVIRUS ISOLATED	0	119	23	0	1	2
CONFIRMED POLIO CASES BY FOLLOW-UP	0	0	0	0	0	0
COMPATIBLE CASES	1	23	0	6	2	1
DISCARDED CASES	393	352	354	296	357	359
TOTAL CASES WITH SPECIMENS COLLECTED	391	490	381	299	356	359
CASES WITH 2 SPECIMENS	388	481	376	298	354	357
CASES WITH 1 SPECIMENS	3	9	5	1	2	2
CASES WITH NO SPECIMENS	3	4	7	3	4	3
TOTAL SPECIMENS COLLECTED	779	971	757	697	710	714
SPECIMENS IN GOOD CONDITION	779	969	757	697	710	714
SPECIMENS IN POOR CONDITION	0	2	0	0	0	0
CASES WITH ADEQUATE SPECIMENS	350	87.6%	88%	93	92%	97%
SPECIMENS WITH POSITIVE RESULTS	0	203	39	0	2	4
SPECIMENS WITH NEGATIVE RESULTS	779	768	718	597	708	710
AFP CASES INVESTIGATED ≤ 48 HOURS	383	99.6%	99%	100%	99%	100%
SPECIMENS ARRIVED LABORATORY ≤ 3DAYS OF BEING SEND	99.2%	99.1%	96%	98%	96%	99%
SPECIMENS RESULTS TURN ROUND ≤ 28 DAYS	95%	90%	96%	99%	99%	96%
NON-POLIO AFP RATE	2.7	2.4	2.4	2.3	2.7	2.6



(Table – 11 )

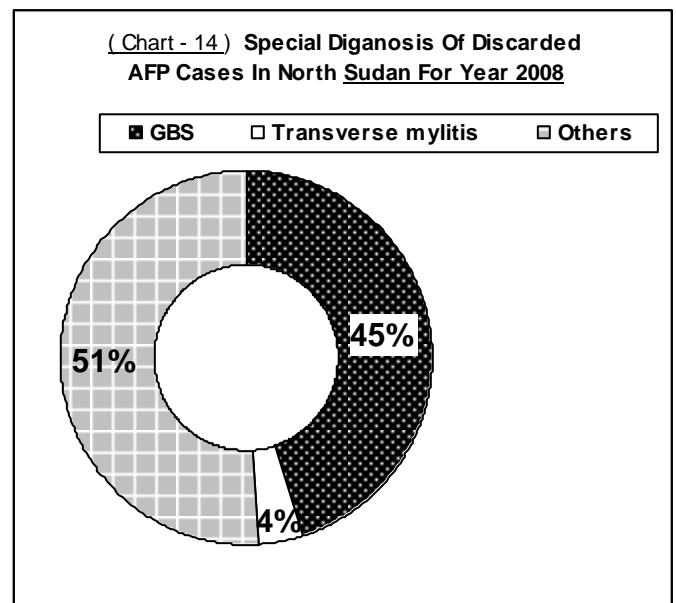
Finding at follow-up for AFP Cases in North Sudan for year 2008

Res Weekness	No Res Weekness	Lost follow-up	Died before follow-up

(Table – 12 )

Special Diganosis of Dicarded AFP cases in for year 2008

Diseases	No.	Percent %
GBS	162	45%
Trnasverse myelitis	14	4%
Traumatic neuritis	17	0.6%
Meningo Encephalitis	26	1.7%
Malaria	38	22%
Sickle –Call anaemia	21	7.4%
Hypokalaemia	11	5.1%
Heimptegia	42	24%
Bacterial meningitis	3	1.7%
Brain abecess	1	0.6%
Lesion of radial	1	0.6%
Cerebral Palsy	1	0.6%
Paraplegia	1	0.6%
Monoplegia	2	1.1%
Rheumatic Fever	3	1.7%
Intracerebal haemorrhage	1	0.6%
Cerebro vascular disease	1	0.6%
Rheumatoid arthritis	1	0.6%
Osteomyelitis	3	1.7%
Viral infection	1	0.6%
Ataxia	1	0.6%
Tuberculosis	1	0.6%
Others 3 Cases classified as 2 <b>Confirmed</b> 1 <b>Compatible</b>		



(Table – 13 )

PERFORMANCE INDICATORS OF AFP SURVEILLANCE SYSTEM IN NORTH SUDAN BY STATES 2008

STATES	EXEPECTED AFP	AFP REPORTED	ADEQUATE SPECIMENS %	1*	2*	3*	4*	CONFIRMED	COMPATIBLE	DISCARDED	ENTERO	Ann-Non polio AFP Rate
BLUE NILE												
GEDARIF												
GEZIRA												
KASSALA												
KHARTOUM												
NORTH DARFUR												
N..KORDOFAN												
NORTHERN												
RED SEA												
RIVER NILE												
SENNAR												
SOUTH DARFUR												
S. KORDOFAN												
WEST DARFUR												
WHITE NILE												
<b>TOTAL</b>												

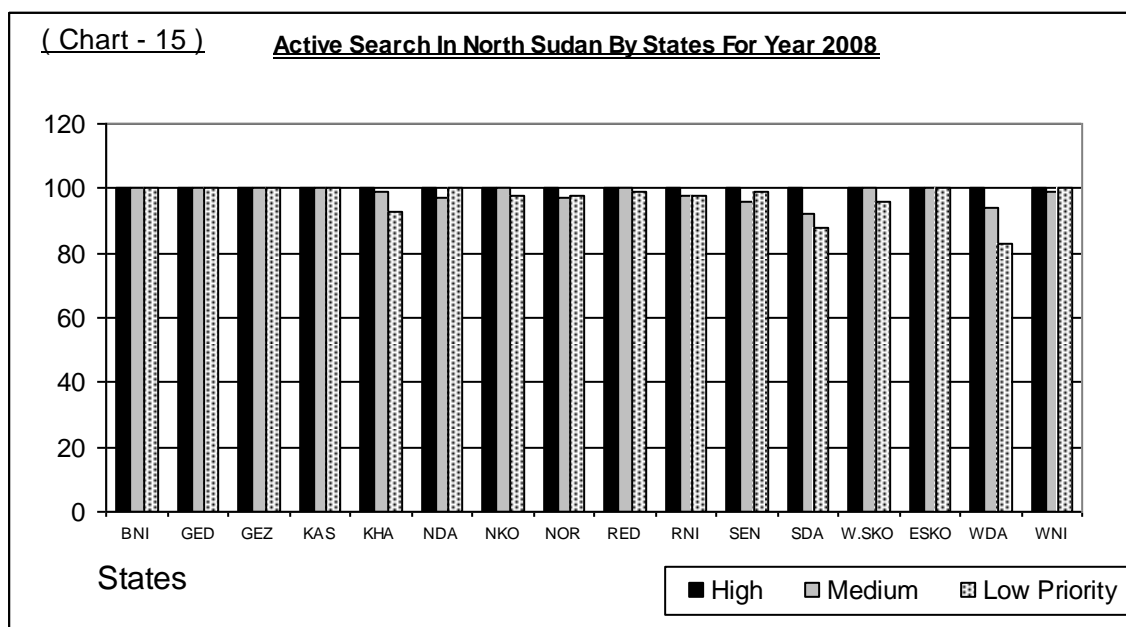
1\* AFP cases investigated within 48 hours

2\* Specimens received LAB. 3 days of being sent

3\* Specimens received LAB. 3 days of being collected

4\* specimens results received EPI 28 days of being received to the LAB.

STATES	High Priority	Medium Priority	Low Priority
BLUE NILE	100%	100%	100%
GEDARIF	100%	100%	100%
GEZIRA	100%	100%	100%
KASSALA	100%	100%	100%
KHARTOUM	100%	99%	93%
NORTH DARFUR	100%	97%	100%
N .KORDOFAN	100%	100%	98%
NORTHERN	100%	97%	98%
RED SEA	100%	100%	99%
RIVER NILE	100%	98%	98%
SENNAR	100%	96%	99%
SOUTH DARFUR	100%	92%	88%
South W . KORDOFAN	100%	100%	96%
South E. KORDOFAN	100%	100%	100%
WEST DARFUR	100%	94%	83%
WHITE NILE	100%	99%	100%
<b>Total</b>	100%	99%	97%

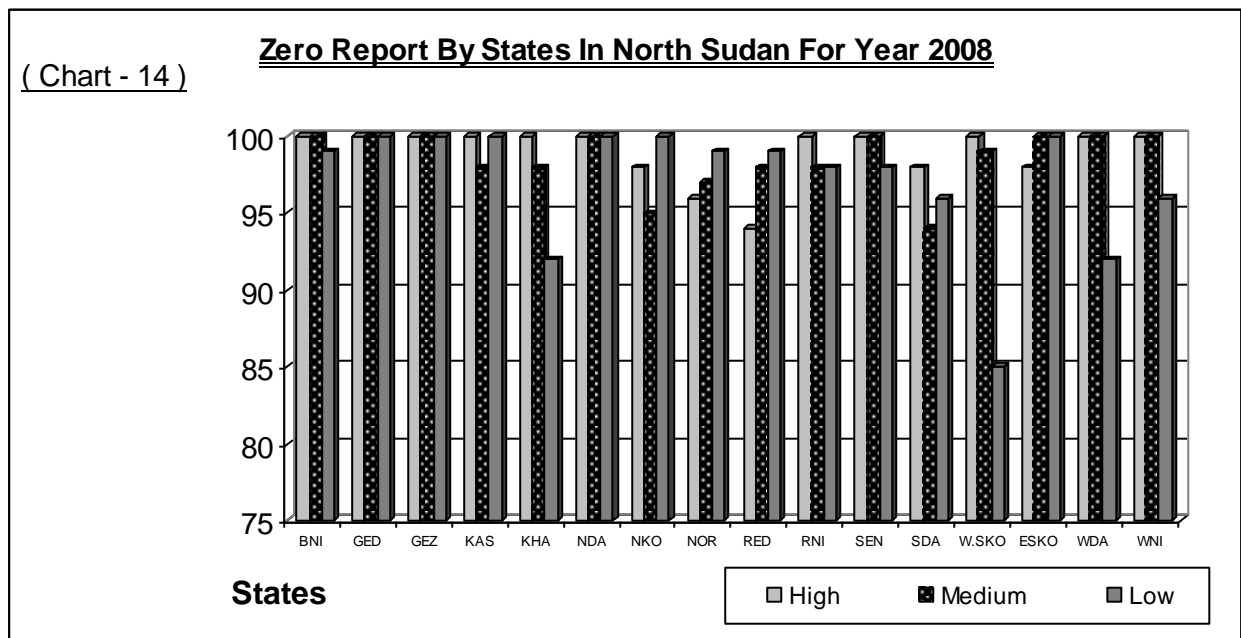


(Table – 14 )

Zero Report by states in North Sudan for year 2008

STATES	High Priority	Medium Priority	Low Priority
BLUE NILE	100%	100%	99%
GEDARIF	100%	100%	100%
GEZIRA	100%	100%	100%
KASSALA	100%	98%	100%

KHARTOUM	100%	98%	92%
NORTH DARFUR	100%	100%	100%
N .KORDOFAN	98%	95%	100%
NORTHERN	96%	97%	99%
RED SEA	94%	98%	99%
RIVER NILE	100%	98%	98%
SENNAR	100%	100%	98%
SOUTH DARFUR	98%	94%	96%
South W . KORDOFAN	100%	99%	85%
South E. KORDOFAN	98%	100%	100%
WEST DARFUR	100%	100%	92%
WHITE NILE	100%	100%	96%
<b>Total</b>	<b>99%</b>	<b>98%</b>	<b>97%</b>



( Table – 15 )

**Investigation of Contacts of AFP Cases In North Sudan For Year 2008**

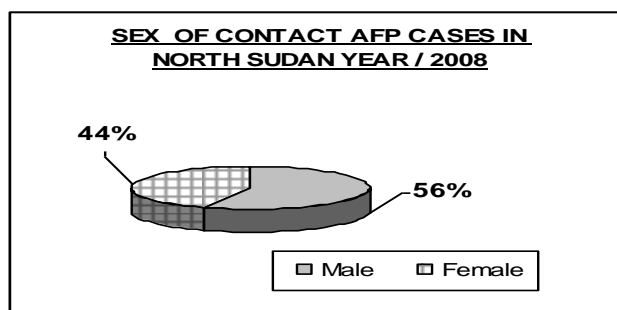
STATES	No of contacts Specimens	Received Lab 3 days of collected	Received Lab 3 days of sent	Stool condition		Lab. Results		Entero
				Good	Poor	Negative	Positive POLIO	
BLUE NILE	0	0	0	0	0	0	0	0
GEDARIF	27	74%	89%	27	0	27	0	0
GEZIRA	10	100%	100%	10	0	10	0	0

KASSALA	32	81%	100%	32	0	32	0	3%
KHARTOUM	13	100%	100%	13	0	13	0	8%
NORTH DARFUR	62	35%	95%	62	0	62	0	21%
N .KORDOFAN	3	100%	100%	3	0	3	0	0
NORTHERN	10	50%	100%	10	0	10	0	0
RED SEA	32	94%	100%	32	0	32	0	9%
RIVER NILE	3	100%	100%	3	0	3	0	0
SENNAR	5	100%	100%	5	0	5	0	0
SOUTH DARFUR	46	46%	93%	46	0	46	0	4%
SOUTH KORDOFAN	12	58%	100%	12	0	12	0	8%
WEST DARFUR	66	12%	100%	66	0	66	0	3%
WHITE NILE	27	52%	100%	27	0	27	0	4%
Total	348	51%	96%	348	0	348	0	7%

( Table – 4 )

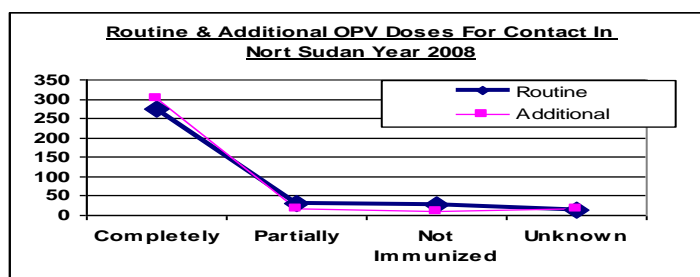
**Contacts of AFP cases by age groups ( North Sudan )  
For Year 2008**

Age Group In Months	No. Of Contact	%
0 – 11	28	8%
12 – 23	69	20%
24 – 35	53	15%
36 – 47	59	17%
48 – 59	76	22%
60 +	63	18%
Total	348	100%



**Contacts Relation with AFP Cases (North Sudan) 2008**

Relation	No
Household – Relative	143 (41%)
Household non - Relative	3 (0.9%)
Out of household Relative	3 (0.9%)
Neighbour	191 (54.9%)
Others	8 (2.3%)
Total	348



## Wild Polio Virus Importation During 2008

In August 2005, the importation of wild polio virus and the epidemic that occurred as a result was contained and since then no evidence of wild polio virus circulation in the country. Thus a certification document was written and forwarded to the Regional Certification

Commission in EMRO, Cairo and was accepted.

Countries neighboring Sudan are free of wild polio virus except Chad which has been suffering from importations from Nigeria. Due to the high population movement between Sudan and Chad a wild polio virus was imported to Shi-aria locality in South Darfur State in 10/9/2007.

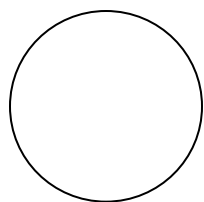
The case was a male child, 30 months of age, presented with acute flaccid paralysis, asymmetrical, and fever. The paralysis affected only the left leg and there was no loss of sensation. The child received 4 OPV doses one routine + 3 Nids. The probable source is the nomadic population moving between Chad and Sudan. Examination of two adequate stool specimens showed that both were positive for wild polio virus type 1.

According to national EPR plan for importation, the Ministry of Health in cooperation with WHO, UNICEF and other partners conducted 3 NIDs rounds using P1 oral vaccine, during October, November and December. This, added to the high routine coverage (91%), raised the immunity level of children so that no any other secondary case resulted so far in spite of the efforts exerted actively to detect AFP cases all over the country.

The importation of this case will not affect the certification situation. An update of the Sudan Certification Document for the year 2007 is now ready to be forwarded to the RCC during March 2006 for consideration in its next meeting in April 2008.

**ACUTE FLACCID PARALYSIS ( AFP )**  
**SURVEILLANCE CENTRAL UNIT**

**ANNUAL REPORT 2008**



KHARTOUM  
MARCH/ 2008

## AFP Surveillance Summary in North Sudan for year 2008

	North Sudan
EXPECTED AFP CASES	133
<b>REPORTED AFP CASES</b>	362
CONFIRMED POLIO CASES	2
COMPATIBLE CASES	1
DISCARDED CASES	359
CASES WITH 2 SPECIMENS	357
CASES WITH 1 SPECIMENS	2
CASES WITH NO SPECIMENS	3
<b>TOTAL SPECIMENS COLLECTED</b>	714
SPECIMENS IN GOOD CONDITION	714
SPECIMENS IN POOR CONDITION	0
<b>AFP CASES WITH ADEQUATE SPECIMENS</b>	97%
SPECIMENS WITH POSITIVE RESULTS	4
SPECIMENS WITH NEGATIVE RESULTS	710
AFP CASES INVESTIGATED <=48 HOURS	100%
SPECIMENS ARRIVED LABORATORY <= 3 DAYS OF BEING SEND	99%
SPECIMENS ARRIVED LABORATORY 3 DAYS OF BEING COLLECTED	71%
SPECIMENS RESULTS TURN ROUND <= 28 DAYS	99%
SPECIMENS WITH ENTERO-VIRUS	14%
NON-POLIO AFP RATE	2.6