

Emergency Response to Yellow Fever Outbreak in the Sudan

Project proposal submitted by WHO and UNICEF
November 2005



BASIC INFORMATION

Project title:	Emergency Response to Yellow Fever Outbreak in the Sudan		
Location:	Southern Kordofan state and surrounding areas in neighbouring states		
Beneficiaries:	Approximately 5,400,000 people (1,800,000 persons in Southern Kordofan and 3,600,000 persons in neighbouring states)		
Involved agencies:	Sudanese authorities and NGOs		
Commencement:	November 2005		
Duration:	Three months (November 2005 to January 2006)		
Amount requested:	WHO:	US\$ 1,417,235	
	UNICEF:	US\$ 4,340,000	
	TOTAL:	US\$ 5,757,235	

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ISSUE

The Federal Ministry of Health (FMOH) received the first report of hemorrhagic fever cases in South Kordofan on 21 October 2005. The next day, an FMOH team left for a field investigation. Of the 11 blood samples taken, 5 tested positive for Dengue (National laboratory, Khartoum), based on rapid test and ELISA. Another 27 more samples were sent to the same lab on 28 October, 14 of which were positive for Dengue, using the same tests. Based on this information, the FMOH declared a Dengue fever outbreak in the area.

Because of the possibility of cross reaction between the different viruses of the same family (flavoviruses), the samples were sent for further testing to the WHO reference lab NAMRU3 in Cairo, Egypt to carry out further testing using the PCR or polymerase chain reaction method. The PCR results confirmed that Yellow Fever virus was the causative agent of the ongoing epidemic.

The last update received on 16 November 2005 from Kadugli in Southern Kordofan State, reported a total of 404 cases, and 117 deaths, which corresponds to a case-fatality rate of 29%.

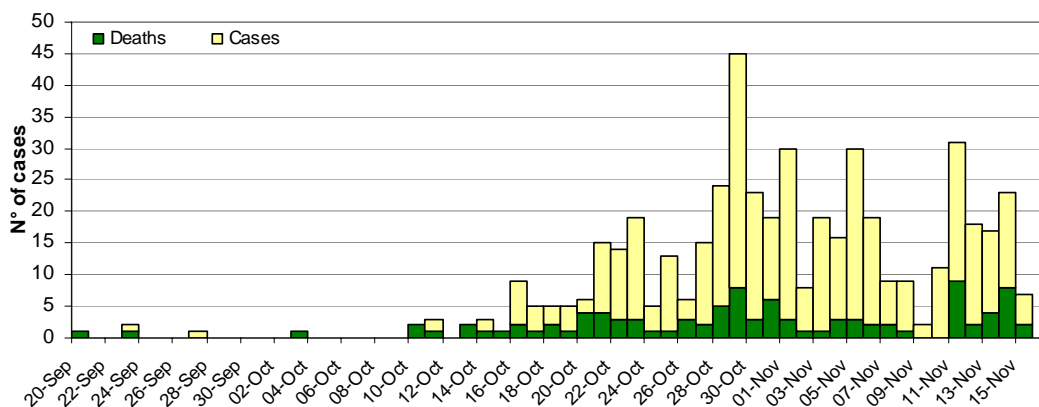
The update received on 9 November 2005 from Kadugli in Southern Kordofan State reported 324 cases and 75 deaths, based on the WHO dengue case definition. This corresponds to a case-fatality rate of 23.1%. Male-female sex ratio was 1.4 (190/133), and the median age 25 years (25 and 75 percentiles of 14.5 and 39.5 respectively). The 0 to 4 years-old age group represented 5.9% (n=19) of the admissions, and the 5 to 15 year-old one 19.1% (n=62). (Table 1).

Table 1: Age group distribution reported hemorrhagic fever cases (n=324). South Kordofan, Sudan, 9 Nov. 2005

Age group (years)	Number	Percentage
0 - 4	19	5.9
5 - 14	62	19.1
15 - 29	100	30.9
30 - 44	81	25.0
45 and more	62	19.1

The first death was reported on 20 September while the first admission was recorded on 23 September (Figure 1). Apart from few sporadic cases in between, a regular and progressively increasing number of admissions were seen as from 10 October. For 13 cases, the date of admission was unknown.

Figure 1 : Suspected hemorrhagic fever cases and deaths per date of admission (n=311). South Kordofan, Sudan, 15 Nov. 2005



Highest attack rates were found in Dilling locality, with 80 admitted cases per 100,000 population. (Table 2 & Map in annex). A total of 154 patients (47.5%) reported to be nomadic.

The last update received on 11 November 2005 from Kadugli in Southern Kordofan State, reported a total of 351 cases, and 101 deaths, which corresponds to a case-fatality rate of 28.8%. At this stage, it is difficult to draw any conclusion, considering the limitations of the data. Depending on the source, the reported case fatality rates vary between 23.1 and 28.8%. During yellow fever outbreaks, case fatality rates of 20% to 40% have been reported. With the data available as of 11 November, no clear conclusion can be drawn on the number of new cases per day, however, it is probable that the trend of the epidemic curve is upwards.

Table 2 : Proportion and attack rates per Locality. South Kordofan, Sudan, 9 Nov. 2005

Locality	Population*	N° of cases	Percentage	Attack rate per 100 000
Dilling	273 760	219	67.6	80
Rashad	273 760	49	15.2	18
Abu Gebeha	261 832	26	8.0	10
Kadugli	249 933	26	8.0	10
Talodi	130 916	4	1.2	3
TOTAL	1 190 201	324	100.0	27

* Source : Expanded Programme of Immunisation, Sudan.

ACTION

The UN response is being coordinated by WHO in close collaboration with UNICEF and NGOs. The WHO response to the yellow fever outbreak included: deployment of a rapid assessment team to investigate the unknown hemorrhagic fever cases in Habila and Dilling Hospitals and in Kauda and Kumbur payams in Rashad County; assistance to the national public health laboratory to transport 38 blood samples to NAMRU-3 for checking other possible viral hemorrhagic fever; training of trainers to facilitate clinical diagnosis and case management in

three hospitals; compilation of case reporting on daily basis and provision of technical assistance to the Ministry of Health to interpret the epidemic pattern and trend. WHO has also been facilitating daily meetings with FMOH in Khartoum, and with SMOH and NGO's on state level. The other actions supported by WHO include translation of the case definition guideline of DF/DHF into Arabic; and provision of insecticide -- 300 liters Ancotrine and 120 Temephos in Habila -- and 400 liters of Ancotrine and 240 liters of Temephos in Kadugli to support the vector control efforts.

UNICEF provided medical supplies including ringer lactate, normal saline fluids, quinine, PHC kits and insecticide treated nets (ITNs). The support provided by UNICEF so far include: process the purchasing of 200,000 doses of vaccines as well as essential drugs, including antimalarial drugs (ACT) to treat 3000 case of malaria; an assortment of anti-pyretic preparations and intravenous fluids; 10,000 sachets of ORS; 16,500 long-lasting insecticide treated nets for the population in the 12 affected locations; 15 sets of blood pressure measuring equipment; 5 knapsack sprayers, 300 liters of insecticide Deltamethrin for vector source reduction; and 12 bicycles for monitoring purposes at community level by health mid-level personnel.

UNMIS arranged logistical support and had 2 teams of doctors to help the case management in Habila. WFP has provided BP5 and CSB (2.7 tons of food).

The support provided by NGOs include the deployment of a team of doctors and nurses and provision of 500 ITNs by MEDAIR; case management and active case finding in Abu Gebeha, as well as active case finding in and around Kadugli, an investigation in Julud and Abu Jibeha area by MSF; provision of IV fluids and medical team transport in Habila area by PANCARE; provision of plastic sheeting and transportation means between Dilling and Habila by SCF-US; and the vector control and community awareness campaign by 40 volunteers of SRC.

The control of the yellow fever outbreak in Southern Kordofan and selected areas in the surrounding states requires a well-coordinated response. Specific activities will include the following:

- Strengthening of case management capacity in all localities of Southern Kordofan and 14 localities in North Kordofan, White Nile, Upper Nile, Unity, Western Bahr El Ghazal, Northern Bahr El Ghazal and South Darfur;
- Improvement of epidemiological follow-up of the outbreak by training in the use of a simple and adapted case definition and improving case reporting information (e.g. presence of key symptoms, onset of symptoms, vaccination and contact history); strengthening communication and transportation means; and increasing sentinel health structures to 40; active case finding and establishing a centralized database;
- Entomological assessment to identify the target areas for preventive and control measures, and expansion of Vector control measures;
- Vaccination, phase I: this phase will cover 1.8 million persons (entire population aged over 9 months in South Kordofan).
- Vaccination, phase II: covering 3.6 million persons in 14 localities in North Kordofan, White Nile, Upper Nile, Unity, Western Bahr El Ghazal, Northern Bahr El Ghazal and South Darfur.

. IMPACT

- Yellow fever outbreak controlled/prevented.

FINANCIAL SUMMARY

FINANCIAL SUMMARY (PHASE I) : SOUTHERN KORDOFAN			
Budget item	Estimated budget (US\$)		
	WHO	UNICEF	Total
I. Vaccination			
Vaccines (2,610,000)	0	2,349,000	2,349,000
Syringes AD for injection, 0.5 ml (2,880,000)	0	288,000	288,000
Syringes for dilution, 20 ml (54,000)	0	10,800	10,800
Safety boxes, 15 litres (7,500)	0	15,000	15,000
Medical items (gloves, cotton, soap etc) (220 sets)	1,100	0	1,100
Equipment (loud speakers) for social mobilisation	38,500	0	38,500
Vaccine Carriers (150)	3,600	0	3,600
Cold boxes (75)	6,750	0	6,750
Ice packs (0.3 L) (1,200)	480	0	480
Ice packs (0.6 L) (3,500)	1,680	0	1,680
Fuel for vehicles	90,000	0	90,000
Operational costs (Incentive for 210 vaccinators; 2,100 volunteers; 25 Supervisors, and 210 drivers), training meetings, transport cost for vaccinators, social mobilisation, and miscellaneous expenditure)	360,000	0	360,000
Total pillar I	502,110	2,662,800	3,164,910
II. Vector control			
Insecticides			
- Larvicides (Temephos 1000 liters)	12,600	5,400	18,000
- Adulticides (Deltametrin and Permethrin 12,500 liters)	56,250	131,250	187,500
Spraying equipment			
- Hand sprayer pumps (50 units)	11,250	0	11,250
- Fogging machines (3 units)	3,600	0	3,600
Operational costs (incentives for spraying teams, protective material, transportation costs)	27,150	0	27,150
Training of spraying operators	2,500	0	2,500
Treated mosquito nets	140,000	245,000	385,000
IEC materials (socio-mobilization, etc.)	5,000	0	5,000
Entomological assessments studies	5,000	0	5,000
Total pillar II	263,350	381,650	645,000

Budget item	Estimated budget (US\$)		
	WHO	UNICEF	Total
III. Surveillance system			
Outbreak response team coordination			
- Epidemiologist 4	108,720		108,720
- Entomologist 2	41,274		41,274
- Lab technician 2	41,274		41,274
- 5 public health officers for supervision and coordination (1 per locality)	15,000		15,000
- 10 health workers (2 per locality) for implementation	18,000		18,000
- Logistician 2	23,637		23,637
Training case definition + strengthening case reporting	9,000		9,000
Increase n° of sentinel sites			
- Training in case definition and case reporting	9,600		9,600
- 20 health workers (4 per locality)	18,000		18,000
- Transport and communication tools	17,500		17,500
Active case finding	12,000		12,000
- 10 health workers (2 per locality)			
Total pillar III	314,005	0	314,005
IV. Case management			
Training on case management	10,000		10,000
Drugs and IV infusions (1000 case/mo*3mo)	120,000	90,000	210,000
Reporting system & medical record	6,000		6,000
Total pillar IV	136,000	90,000	226,000
Sub-total	1,215,465	3,134,450	4,349,915
Technical assistance, project supervision and monitoring	121,550	250,750	372,300
Cross-sectoral costs*	80,220	434,000	514,220
Recovery rate**	0	520,800	520,800
TOTAL BUDGET REQUESTED	1,417,235	4,340,000	5,757,235

* WHO Programme Support Costs 6%.

** UNICEF The actual recovery rate on individual contributions is calculated in accordance with the Executive Board Decision 2003/9 of 5 June 2003.

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