

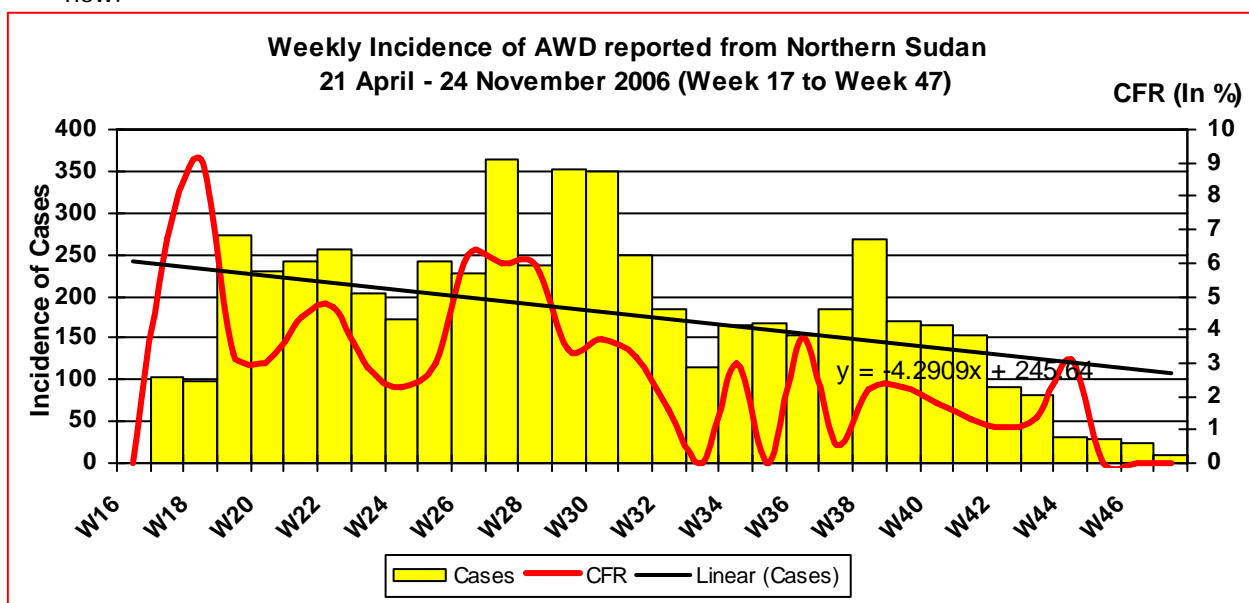
Situation Report on Acute Watery Diarrhoea Outbreak in Northern Sudan

Date of Reporting: 26 November 2006

1. Overview

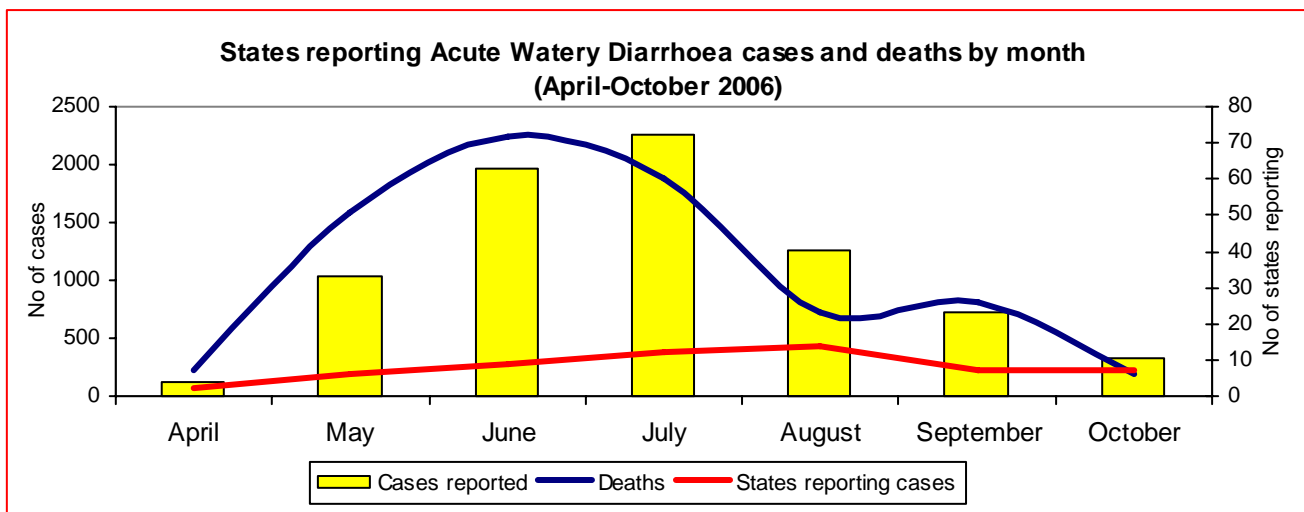
Between 21 April and 24 November 2006, the Federal Ministry of Health (FMOH) has reported a total of 9,516 cases including 250 deaths (CFR=2.6%) from Acute Watery Diarrhoea (AWD) in Northern Sudan. A summary of the current situation is as follows:

- The outbreak, beginning from 21 April 2006, eventually spread to all the fifteen states in Northern Sudan. Currently, however, only Sennar state, where the outbreak spread during the first week of October, and Gederef state where the outbreak started in July are reporting sporadic cases of Acute Watery Diarrhoea. The remaining states are reporting "zero" cases for the last four consecutive weeks.
- *Vibrio cholerae* 01 serotype Inaba were laboratory confirmed by the National Public Health Laboratory (NPHL) of Sudan in 139 (43.3%) out of 321 stool samples collected so far from these AWD cases.
- Repeat laboratory analysis of selective positive isolates of *Vibrio cholerae* conducted at NAMRU-3 has confirmed that all the strains belonged to bio-type El Tor and sero type- 01 Inaba. Further characterization of these positive isolates using molecular technique have been carried out by NAMRU-3 ;
- Of these reported cases of AWD, 17% have occurred in South Darfur (CFR: 2.2 %), 16% in North Kordofan (CFR: 2.9 %) and 11% have occurred in Khartoum state (CFR: 4%);
- The overall case fatality rate of AWD during the reporting period (21 April-24 November 2006), remains at 2.6%. The death rate broken down by states range between 1 to 5%.
- The FMOH formed a cholera task force to coordinate the overall public health response to this outbreak. WHO actively participated in this task force assuming the overall responsibility for epidemic risk assessment, surveillance and standardizing case management;
- In all the states of Greater Darfur, no cases of AWD have been reported for more than 4 weeks now.



2. Situation assessment

The current outbreak started on 21 April 2006 in Khartoum state and then rapidly spread to other neighbouring states. Seasonal factors such as the rainy season along with population movements between the states might have contributed to this rapid spread amongst the vulnerable populations living in unsanitary conditions of these states. The weekly progression of the disease, as has been depicted in the epidemic curve, shows that the peak of the outbreak might have occurred between epidemiological week no 27 and 30 and despite improvement in surveillance system and increase in number of states reporting cases of AWD, the trend to decline is observed from almost all the states including in Darfur. For example, as opposed to week no 27 to 31 when an average of 300 to 350 cases of AWD were reported throughout the country, a weekly incidence of around 9 to 10 cases are, currently, being reported from Northern Sudan. The cumulative incidence of Acute Watery Diarrhoea increased from 113 in April to 2,255 cases reported in July, 2006. During the same period, the number of states reporting cases of acute watery diarrhoea increased from 2 to 12 states. In August 2006, only 1,260 cases were reported signifying a perceptible decrease in the number of reported cases despite the fact that the number of states reporting cases of AWD increased to 14 in the month of August, 2006. Comparatively, only 723 cases of AWD were reported in September and 327 cases were reported in October from 7 states of Northern Sudan registering a sharp decrease of cases reported during these two months (between 40 to 60 percent decrease) compared to cases reported in July when the peak of the outbreak occurred. The situation has also improved in Darfur region where cases have not been reported for the last four weeks now despite the fact that active surveillance for case search is still ongoing in all vulnerable pockets of Darfur.



Since the causative strain of this outbreak was new to Sudan (In all past documented outbreaks of Cholera in Sudan, the causative strain was *Vibrio cholerae* O1 sero type *Ogawa* and not *Inaba*), the death rate peaked over 9% during the initial weeks of the outbreak and after some cyclical fluctuations, death rate started to decline beginning in week no 29. However, during week no 34 and 36, the weekly death rate again spiked to above 3 percent and this spike, mostly, corresponded to deaths reported during the same period from some inaccessible areas of Darfur. For the last three consecutive weeks, the weekly case fatality rate remained at 0 percent.

The microbial sensitivity test of the causative strain of this outbreak conducted at NAMRU-3 shows that all strains were sensitive to Doxycycline except one strain which was multiple drug resistant.

Table-1: Cumulative incidence of Acute Watery Diarrhoea reported from Northern Sudan: 21 April-24 November

State	Date of reporting of "first/index" case	Cumulative number of cases reported till 24 November 2006*	Cumulative number of deaths reported till 24 November 2006	Overall CFR
Khartoum	21/04/2006	1046	41	4 %
North Kordofan	25/04/2006	1602	47	2.9 %
White Nile	17/05/2006	782	21	2.6%
South Darfur	30/05/2006	1659	37	2.2%
South Kordofan	02/06/2006	770	16	2 %
River Nile	14/05/2006	573	20	3.4%
Al Gezira	30/06/2006	120	5	4.1%
**Gedaref	08/07/2006	1266	13	1%
Kassala	29/06/2006	860	26	3 %
North Darfur	18/08/2006	252	7	2.7%
**Sennar	02/10/2006	185	3	1.6%
West Darfur	09/08/2006	277	8	2.8%
Other states (Northern Blue Nile and Red sea states)		124	6	4.8%
Total		9516	250	2.6%

* The cumulative number of reported cases have increased due to retrospective reporting from the affected states.

** States still reporting cases of AWD

3. Ongoing Control Measures

WHO is working closely with the FMOH providing technical support for control and management of this ongoing outbreak. Public health control measures like improvement of environmental health, particularly chlorination of public water supplies and hygiene promotion remained stepped up in the states still reporting cases of acute watery diarrhoea. The Water and Environmental Sanitation Department of the government with support from UNICEF, and NGOs are involved in chlorination of public water supplies in all the affected states. In Darfur, in particular, WHO is actively engaged in ensuring microbial quality standards of the drinking water in the IDP camps.

4. WHO's current response

WHO along with the Epidemiology department of FMOH is currently contemplating to conduct an assessment of the outbreak control measures for Acute Watery Diarrhoea recently concluded in the affected states. Combining both quantitative and qualitative techniques, the assessment would look into the quality as well as the outcome of the control measures in the affected states by way of using some "proxy" process indicators. Data collection tools to be used for the assessment are currently being field tested. The assessment would draw valuable institutional lessons for improving public health preparedness for AWD in Northern Sudan in future.