

Epidemic

Sudan

Date

March - May 1988

Location

Khartoum and environs; also occurring to a lesser extent in Darfur and Kordofan provinces

No. Dead

1,608

No. Affected

23,267

The Disaster

In February 1988, several cases of cerebrospinal meningitis caused by group A meningococcus appeared in Khartoum. As the outbreak turned into an epidemic, cases continued to be concentrated in Khartoum and the central region. These two areas accounted for 70% of the 23,267 cases reported as of May 5. Darfur, Kordofan, and northern and eastern regions also reported significant numbers of cases. About 1,608 victims died from the disease. Health officials predicted that the disease would peak in May and fall off as the rains began. The severity of the epidemic was attributed to the intersection of a six-year cycle and a 25-year cycle of the disease.

Action Taken by the Government of Sudan (GOS)

Along with UNICEF, the Ministry of Health (MOH) conducted intensive vaccination campaigns in areas struck by the epidemic. After using the 1.5 million to 2.9 million doses held in storage, the MOH requested additional vaccine from the international community.

Assistance Provided by the U.S. Government

On April 20, U.S. Ambassador G. Norman Anderson declared that a state of disaster existed in the Sudan and recommended that OFDA grant UNICEF/Sudan \$65,000 for the purchase of vaccine and \$25,000 for the purchase of needles and syringes. OFDA authorized a grant of \$90,000 to UNICEF at the end of April and facilitated locating the vaccine in the United States since available supplies were limited.

CDC also initiated a plan to evaluate epidemic prevention and control strategies in the Sudan. Due to the high level of international cooperation during the epidemic, USAID/Khartoum suggested that CDC involvement be postponed until needed.

TOTAL \$90,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

WHO - provided 500,000 doses of vaccine and administered the vaccine in refugee camps.

UNICEF - contributed 250,000 doses of vaccine and worked with WHO and the MOH to locate and administer the vaccine.

Governments

Canada - funded vaccine and transportation costs, valued at \$65,000.

Kuwait - gave 200,000 doses of vaccine.

Libya - provided 1,000,000 doses of vaccine.

Saudi Arabia - furnished 400,000 doses of vaccine.

Non-Governmental Organizations

Goal (Irish PVO) - worked in refugee camps with victims of the epidemic.

Institute Merieux - sent a team to inspect and certify MOH storage and handling of vaccine.

TOTAL \$65,000

Date

Aug. 4-5, 1988

Location

East-central Sudan, including Khartoum and environs (Omdurman), Kassala, Ad Damer, Atbara, Showak, and Gedaref

No. Dead

96 dead, although other estimates reached into the hundreds

No. Affected

At least 1,500,000

Damage

Hundreds of thousands of homes were structurally damaged or destroyed; hydro-electric turbines, telephone and power lines, transportation routes, and city water system sustained serious damage.

The Disaster

Unprecedented rains on Aug. 4 and 5 deluged Khartoum and other urban areas of east-central Sudan producing the worst floods ever to have hit the country. Unofficial reports indicated a death toll in the hundreds. Floods left many victims in critical need of food, shelter, and medicine.

Hundreds of thousands of homes were destroyed or critically damaged, leaving at least one million people homeless. Most of the makeshift houses of the displaced southerners in shantytowns around Khartoum were washed away. City transportation routes were impassable for a time, making the squatter settlements inaccessible for the initial transport of relief goods and food. Railways and roads to the north and east were also damaged. Other affected cities included Kassala, Ad Damer, Atbara, Showak, and Gedaref. At least 1.5 million people were severely affected by the floods.

Silt and debris clogged turbines at Roseires dam, located on the Blue Nile southeast of Khartoum. Resulting power shortages reduced the availability of potable water, which is usually circulated by electric pumps in every residence. The rains also destroyed the majority of telephone and electrical lines throughout the affected areas. As of October 1988, telephone service in Khartoum was still out of order.

An abundance of stagnant water in the aftermath of the floods generated great concern over the health hazards associated with waterborne diseases and malaria.

Heavy showers on Aug. 12 exacerbated flood conditions in the Khartoum area. The Nile, still swollen from the deluge of Aug. 4-5, peaked at 17 meters (56 feet) in height on Aug. 27.

Action Taken by the Government of Sudan (GOS) and Non-Governmental Organizations

The Sudanese military proved instrumental in the immediate evacuation of flood victims to higher ground. The GOS declared a six-month national emergency and allocated an initial 6 million

Sudanese pounds (\$1.3 million) for emergency efforts. Due to the severity of the flooding, the GOS also appealed to the international community for assistance.

The military also managed a system for distributing incoming relief supplies from the airport to affected areas and permitted only limited participation of the international community in this system. The GOS transported donations of medical supplies directly from the airport to central medical stores for inspection and clearance. From there, the Ministry of Health distributed supplies to existing health centers in affected areas.

The leading national NGOs designated to assist flood victims included the Sudan Council of Churches, Sudanaid, the Islamic African Relief Agency (IARA), and the Sudanese Red Crescent.

National NGOs, with assistance from the USG and other donors, implemented an emergency water program, targeting an estimated 400,000 flood victims. Water was pumped from a variety of sources, chlorinated, and then transported in tankers to affected populations.

Assistance Provided by the U.S. Government

On Aug. 6, U.S. Ambassador G. Norman Anderson declared that the floods in the Sudan warranted USG assistance. USAID/Khartoum provided 1,000 MT of sorghum and 200 MT of supplemental foods from in-country USG stocks. In addition, USAID/Khartoum gave \$79,000 in local currency for the purchase of 8,000 bags of charcoal for cooking to be distributed by the Sudanese Red Crescent.

OFDA dispatched disaster expert Fred Cuny to assess damage to housing and to assist USAID and the Embassy in directing the USG relief response. On Aug. 10, a C-5A carrying Mr. Cuny and 2.2 million sq. ft. (858 rolls) of OFDA-donated plastic sheeting departed the United States for Sudan. Local NGOs distributed the plastic sheeting to the displaced in Khartoum for temporary shelter. OFDA delivered an additional 770 rolls of plastic sheeting in September and



Khartoum neighborhoods inundated by Nile flood waters.

Photos by Dr. Ellery Gray, OFDA

October 1988. *[Note: Some of the plastic sheeting may have been distributed to people displaced by civil strife, which was a simultaneous disaster (see "Sudan Civil Strife"). In OFDA accounts, the cost of airlifting 385 rolls of plastic (half of the 770 rolls) was charged to the civil strife/drought disaster, and the airlift cost of the remaining 385 rolls was charged to the flood disaster.]*

OFDA medical officer Ellery Gray, a Public Health Service employee detailed to OFDA, traveled to Khartoum on Aug. 14 and remained until Aug. 22 to assist the GOS in assessing health facility needs. USAID/Khartoum, UNICEF, WHO, the GOS MOH, and the Sudanese Red Crescent developed an emergency health care delivery system, using approximately five million Sudanese pounds from counterpart funds to support the operations.