

Acute Watery Diarrhea Case Study: Sudan

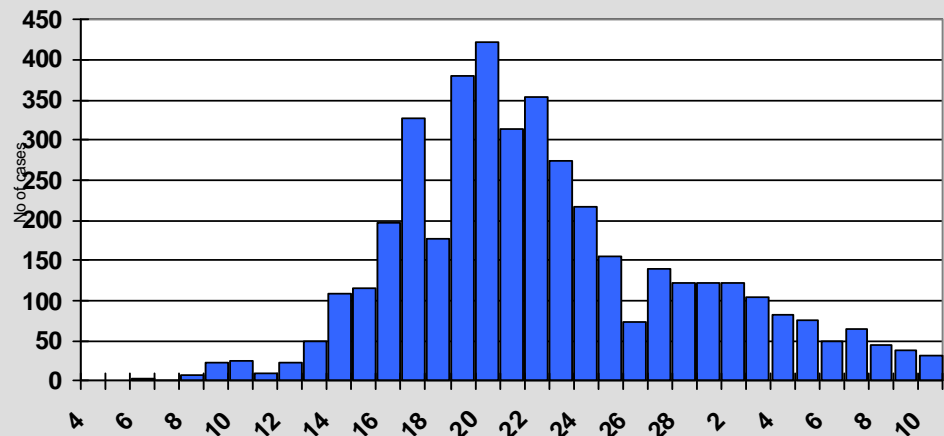


Introduction

Sudan is recovering from a 20 year civil war. Many displaced persons are returning to their homes and to major towns. An outbreak of acute watery diarrhea is detected in Yei (population 50,000) in late January. The number of cases rises quickly and medical and public health teams are mobilized. The outbreak spreads to nearby villages and begins to overwhelm the health facilities.

Approximately 150 km away is the capital Juba with approximately 300,000 persons. Sanitary conditions are extremely poor and access to safe water is low. The early warning surveillance system has detected several cases of acute watery diarrhea in Juba on February 6. Several other cases are detected in subsequent days most of which have occurred in older children and adults. Two persons have already died. The NGO working in the hospital collects 10 stool specimens and has them tested for cholera. Five of them test positive for *Vibrio cholera* 01. The number of cases continues to rise and three cholera treatment centers are set up in local clinics.

The graph below shows the epidemiologic curve between February 6 and March 10. By the end of the outbreak approximately 7,500 cases were detected in the treatment centers. Cases were detected in all parts of the town.



Question 1

Calculate the Attack Rate (AR) for this outbreak. Considering the poor hygiene conditions, widespread distribution of cases, and lack of exposure to cholera in the past would you expect a higher AR? [5 minutes]

Part 2

The following information was provided by the three cholera treatment centers (CTC):

Clinic	Total cases	Deaths
Facility A	2,250	60
Facility B	3,100	55
Facility C	1150	70

Question 2

Calculate the case fatality rate (CFR) for each of the three CTCs. How do the CFRs compare to the WHO standard? What might account for the difference in CFRs across different health facilities? **[5 minutes]**

Question 3

Juba has a water treatment plant but it only serves about 10% of the population. The plant draws water from the Nile River which has a turbidity of 20 to 50 NTU. The filters at the plant are barely functional and at the time of the outbreak there is no chlorine gas on hand. About 40% of the population collects water from boreholes with hand pumps. There are 350 wells in Juba with 280 of them functional. The remaining people collect water directly from the river using buckets and jerry cans or they get it from vendors who collect river water and sell it from trucks or donkey carts. Approximately 20% of the households have access to a latrine. The remaining families go to the bush and often to the river banks. Solid waste is a big problem in the town as are nuisance flies. Health education and hygiene awareness are fairly low.

What would be your top 3 environmental health priorities be and why? **[5 minutes]**

Question 4

The town of Malakal lies directly north of Juba along the Nile River. To date, no cases of cholera have been detected but as there is frequent movement between Juba and other affected areas and Malakal there is concern that an outbreak is inevitable. The population is estimated at 120,000. A water treatment plant serves about 25% of the population with the rest collecting directly from the river. Sanitation and hygiene is poor. Your agency has several health programs in and around Malakal.

a) What steps would you take immediately to prepare for a possible outbreak? [5 minutes]

b) Your head office is interested in conducting a cholera vaccination program in Malakal town. The vaccines can be delivered within 7 days. Assume a cost of US 8 dollars per person vaccinated (includes all operational costs). What would be the pros and cons of vaccinating? Would you support such an effort? [10 minutes]

