

## Surveillance of yellow fever in Ghana, 1969 et 1970

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### 1. INTRODUCTION.

The occurrence of illnesses characterised by jaundice and fever is common in Ghana. In the absence of a virus laboratory to assist with investigations, these illnesses have in the past been diagnosed on clinical grounds as infective hepatitis. The numbers of such notifications in 1969 are shown according to regions in Table I, which shows that the experience in the Upper Region was markedly different from the rest of the country.

TABLE 1. — *Notified Cases of Jaundice and Fever 1969*

Regions	N° of cases	N° of deaths	Fatality rate %
Western Region ..	842	11	1.3
Central Region ..	231	1	0.4
Accra Region ...	488	5	1.0
Eastern Region ..	750	13	1.7
Volta Region ....	325	4	1.2
Ashanti Region ..	612	30	4.9
Brong-Ahafo Region .....	859	6	0.7
Northern Region .	269	5	1.9
Upper Region ...	387	91	23.5
TOTAL .....	4 763	166	3.5

Until recently the diagnosis of yellow fever has been based mainly on the histological appearance of the liver

of hepatitis cases. The diagnosis of suspected cases of yellow fever has been on the basis of the clinical features of jaundice and fever accompanied by haemorrhagic episodes. Death within one week of the onset of illness reinforced the suspicion of yellow fever. The recorded cases of yellow fever during the period 1960-1970 are as follows :

Year	Number of cases	Deaths	Locality
1963	3	3	Kumasi (Ashanti) Damongo (Northern Region)
1964	1	0	Agogo (Ashanti)
1965	2	2	Agogo (Ashanti)
1969	303 (12 confirmed)	72	Pong-Tamale (Upper Region and Northern Region)
1970	12 (all confirmed)	7	Eastern Region

### 2. 1969 YELLOW FEVER EPIDEMICS.

#### 2.1. Northern Region.

The experience of yellow fever in 1969 started at Pong-Tamale, a town of 3,200 people (1970 Census) famous for many years as a centre for veterinary research and the training of veterinary officers. It is 23 miles north of Tamale on the Tamale-Bolgatanga road.

Yellow fever was suspected when 5 jaundiced patients were admitted to the Tamale Hospital from Pong-Tamale between 15 and 19 September. The death of two of them on 18th September heightened suspicion. A third patient died subsequently. The diagnosis of yellow fever was confirmed histologically for the 3 deceased and serological confirmation was obtained when paired sera of the two patients that survived were examined at the Pasteur Institute, Dakar.

Four of the patients were from the Boys' Industrial School and the fifth worked on the Pong-Tamale Veterinary School farm. The ages ranged from 15 years to 18 years. The clinical features were fever, jaundice, abdominal pains, and prostration. No haemorrhagic episode was reported. Albuminuria was not marked.

Investigations at Pong-Tamale, Tamale and their surrounding villages failed to reveal any more cases.

The measures taken to control the outbreak included vector control, health education and mass vaccination against yellow fever in Pong-Tamale, Tamale and the surrounding villages. A total of 15,554 vaccinations were done.

**2.2. Upper Region.**

Reports of deaths after short periods of illness reached the Regional Medical Officer of Health (RMOH) for the Upper Region et Bolgatanga in October at the same time as the information about the occurrence of confirmed yellow fever in the neighbouring Republic of Upper Volta.

Investigations by Dr. BAUSOLEIL (RMOH) and Dr. HERRON (USAID Smallpox & Measles Programme) revealed that the epidemic probably started in August.

The clinical features included jaundice, fever, abdominal pains, prostration, coma, haemorrhagic episodes (coffee-ground vomitus) and anuria.

Mass vaccination against yellow fever, vector control and health education were started immediately. The epidemic came to an end in December.

The epidemic reached its peak before the health authorities became aware of it. A total of 303 cases and 72 deaths were recorded. The distribution by hospitals were as in Table 2.

Hospital	Cases	Deaths	Mortality
Bolgatanga .....	49	8	16 %
Navrongo .....	61	12	20 %
Nandom .....	40	11	28 %
Jirapa .....	153	41	27 %
Total .....	303	72	24 %

Most of the cases (296) were diagnosed solely on clinical evidence. Only 7 out of the 487 specimens of blood received at the Virology Laboratory of the Ghana Medical School were paired. All 7 paired sera showed evidence of rising antibody titre to yellow fever antigen. The Pathology Department of the Ghana Medical School also confirmed 4 cases by the histological appearance of the liver specimens.

The distribution by age-groups of jaundiced patients seen at the Navrongo Hospital during 1967 and 1969 showed a marked difference as in Table 3.

TABLE 3. — Distribution of Jaundice and Fever Patients by Age-Groups 1967 and 1969 Data from Navrongo Hospital

Age-Group	1967		1969		Fatality Rate	
	Cases	Deaths	Cases	Deaths	1967	1969
0- 4 .....	—	—	16	8	—	50 %
5-14 .....	3	0	4	1	0 %	25 %
15-44 .....	9	1	38	9	11 %	29 %
45 + .....	1	0	3	3	0 %	100 %
Total .....	13	1	61	21	7.8 %	34 %

**3. YELLOW FEVER IN 1970.**

**3.1. Epidemiology.**

A decision was taken to extend vaccination to epidemiologically important areas because of the fear that

the disease may appear in other parts of the country during the rainy season of 1970. These fears were realised earlier than expected. The first report came from St. Dominic Hospital, Akwatia in the Akim Abuakwa district of the Eastern Region. The St. Dominic Hospital reported 8 cases which were all confirmed serolo-

gically or histologically. C.A.S.T. Hospital also at Akwatia reported 1 case. Korle Bu Hospital reported 2 cases that had been transferred there from Asamankese Health Centre.

Altogether, 11 confirmed cases came from Asamankese, Manso, Ntronang, Kade, Anyinase, Akim Aboaso, Akoasi and Assikasu all in the Akim Oda and Akim Abuakwa districts of the Eastern Region. The 2 cases from Assikasu were from the same house. Investigation at Assikasu suggested that 8 people had died of a disease that was characterised by jaundice during the previous months. No more cases of yellow fever were reported from the area after May.

The last case of yellow fever during 1970 was reported from Dormoa Hospital in the Brong-Anafo Region in November. It was diagnosed on the basis of the histological appearance of the liver. Investigations in the area did not yield evidence of the presence of yellow fever. The total number of cases of yellow fever in 1970 came to 12 cases and 7 deaths.

**3.2. Vector Surveys.**

Yellow fever vector surveys were undertaken in the affected areas during the 1969 and 1970 outbreaks of the disease. In October 1970, W.H.O. also provide a consultant entomologist who investigated the epidemic areas with field staff from the National Malaria Service.

At Pong-Tamale only 2 houses out of 246 inspected during October 1969 were found to be breeding *Aedes aegypti* larvae. But Mr. MOUCHET (W.H.O. Consultant)

reported 11 of the 40 houses visited to be breeding *Aedes aegypti* (L.) larvae in October 1970. Some *Aedes simpsoni* Theo. larvae were also found in taro leaf axils.

In December 1969 the house indices found in the Upper Region were 5.8 % at Paga and 11 % at Bolgatanga. The results of Mr. MOUCHET's survey in September 1970 were 24 % at Paga and 17 % at Bolgatanga.

During the epidemic in the Eastern Region in April 1970 *Aedes aegypti* were found breeding in all the affected towns and villages. The house index for Manso was as high as 50 %.

It is planned to extend the vector surveys to other parts of the country.

**4. VACCINATION AGAINST YELLOW FEVER.**

Table 4 shows the vaccinations which were done during the epidemics in 1969 and 1970. In view of the long duration of immunity conferred by yellow fever vaccination (probably life-long) and the persistent threat of epidemics of yellow fever, it is now proposed to vaccinate the entire population of Ghana. Table 4 also shows the approximate numbers that required vaccination in each region in 1970 to achieve total coverage. About 400 000 doses of vaccine were received from WHO in 1970.

Each of the nine regions possesses six Ped-O-Jets and three vaccination teams. But the reserve Ped-O-Jets can when necessary be brought into operation to form six vaccination teams.

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TABLE 4. — Yellow Fever Vaccinations in 1969 and 1970

Region	Population	Vaccination 1969	Vaccination 1970	Number unvaccinated
Western .....	768,312	—	—	768,312
Central .....	892,593	—	—	892,593
Accra .....	848,825	—	98,922	749,903
Eastern .....	1,262,882	—	262,735	1,000,147
Volta .....	947,012	—	—	947,012
Ashanti .....	1,477,397	—	—	1,477,397
Brong-Ahafo .....	762,673	—	—	762,673
Northern .....	728,572	15,554	—	713,018
Upper .....	857,295	217,938	2,456	636,901
Total .....	8,545,561	233,492	364,113	7,947,956