

## 2. A REPORT ON HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION IN GHANA UP TO DECEMBER 1986

By

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### Summary

One hundred and fifteen people detected to be seropositive for HIV infection in Ghana in 1986 are described. Ninety per cent were female, most were of the sexually active age group. Ninety-six per cent had recently resided abroad, particularly in Cote d'Ivoire, and many had worked abroad as prostitutes. They had most probably acquired infection there. Seventy-six per cent were ill with AIDS or AIDS related complex. Random sampling of groups of the general population revealed no seropositives, although 4 prostitutes working in Accra/Tema were infected. Of attendants at an Accra venereal disease clinic 3 were infected all of whom had been to Cote d'Ivoire recently.

Our results show that the AIDS virus has now spread into Ghana and urgent measures are described to try to prevent the spread of AIDS throughout the community.

### Introduction

Acquired immunodeficiency syndrome (AIDS) has been reported from various parts of the world since the first cases were reported in the U.S.A. in 1981. By 1985 it had become apparent that an epidemic was occurring in Central Africa especially Zaire.<sup>1</sup> Both sexes were equally affected. Its spread into East Africa, particularly Uganda and Kenya, carried possibly by traders was documented by 1985<sup>2</sup>. In August 1986 a hospital-based study in Lusaka, Zambia reported a 17.5% incidence of seropositivity to HIV in 1078 subjects, a cross section of patients, staff and blood donors<sup>3</sup>. People in the sexually active age group were more

likely to be infected and of these, seropositivity was more likely to be present in the higher socio-economic group and in patients with venereal disease, who may have had more than average sexual contacts. AIDS is also seen now in Zimbabwe (F. K. Nkrumah personal communication). Before 1986 no cases of AIDS had been documented in Ghana and no patients with an illness clinically resembling AIDS were reported. Kaposi's sarcoma, a malignancy whose incidence has been shown to rise with the spread of AIDS<sup>4</sup>, was very rare (personal observations). However in 1985 the Government became concerned that there was no information about the incidence on the disease in Ghana, particularly as the International Press was hinting that it was widespread throughout the continent of Africa. The National Technical Committee on AIDS was formed to advise the Government on the situation. The report presented here shows data about infection with HIV in Ghana from November 1985 to December 1986.

### Materials and Methods

Information about AIDS together with the WHO clinical definition of the disease was circularised to doctors working in all areas of the country by the Technical Committee, and they were asked to look for suspected cases. Having identified a suspected case they were asked to complete a form with demographic data and to send this together with a sample of blood or serum to Accra, where the sera were tested at the Noguchi Memorial Institute for Medical Research. At the same time sera from groups of people thought to be at risk were tested, that is prostitutes and patients with sexually transmitted diseases

S.T.D.) as well as sera from samples of the general population, for example blood donors, laboratory workers and patients with diseases such as malignancies and cerebro-spinal meningitis (CSM). Some of the blood donors and laboratory workers were tested in November 1985. In all 1095 samples were tested by the Elisa method (Wellcome) and those positive were confirmed

by an indirect immunofluorescence antibody technique (IFAT) using H9/HTLV III as antigens. The IFAT was essentially similar to the method described by Hayami *et al*<sup>5</sup> with a modification using a 1: 20 dilution.

### Results

Table 1 shows monthly and sex distribution, total number of people tested and the number positive for human immunodeficiency virus (HIV) infection from January 1st, 1986 to December 31st, 1986. The first AIDS patients was documented in March 1986. This was a woman from West Germany who had just arrived in Ghana with her Ghanaian husband. She was suffering from AIDS related complex, but the man was well. They had been found to be HIV positive while still in Germany and the results were confirmed by our test. From May onwards, increasing numbers of seropositive cases were found in Ghanaians. One hundred and three of 115 positive were female (89.6%). The age and sex incidence is shown in Table 2. Eighty-nine per cent of those seropositive were between the ages of 16 and 44 years, with the peak incidence in females occurring between 16 and 34, and in males between 25 and 34 years.

TABLE 1: Monthly Distribution of HIV Infections in Ghana from January 1st to December 31st 1986 showing the number tested in each Group.

Month	Male	Female	Not Known	Total
January ..	0/0	0/0	—	0
February ..	0/18	0/27	—	0/45
March ..	1/12	2/124	0/2	3/138
April ..	0/16	1/3	—	1/19
May ..	2/65	2/52	—	4/117
June ..	3/47	10/34	0/1	13/82
July ..	2/23	14/42	—	16/65
August ..	1/30	15/33	—	16/63
September ..	0/32	31/74	—	31/106
October ..	0/12	11/21	—	11/33
November ..	1/49	10/17	—	11/66
December ..	2/28	7/23	—	9/51
Total ..	12/332	103/450	0/3	115/785

This table does not reflect the actual incidence of seropositivity as many of those tested were selected as likely to be infected.

TABLE 2: Age and Sex Distribution of HIV Infection in Ghana from January 1st to December 31st 1986 showing the number tested in each Group.

Age (Years)	Male	Female	Not Known	Total
Under 1 ..	1/3	1/2	—	2/5
1 - 5 ..	0/9	1/20	—	1/29
16 - 24 ..	0/42	32/87	—	32/129
25 - 34 ..	7/93	36/102	—	43/195
35 - 44 ..	1/47	12/42	—	13/89
45 - 54 ..	0/23	8/27	—	8/50
55 - 71 ..	0/2	0/3	—	0/5
Unknown ..	3/113	13/167	0/3	16/283
Total ..	12/311	103/450	0/3	115/785

This table does not reflect the actual incidence of seropositivity as many of those tested were selected as likely to be infected.

TABLE 3 Clinical Status of 115 HIV Seropositive Subjects in Ghana, January 1st to December 31st 1986

AIDS	AIDS Related Complex	Healthy Carriers	Status unknown
61 (53%)	26 (22.6%)	11 (9.6%)	17 (14.8%)

TABLE 4: Notification by Regions of 115 HIV Seropositive people in Ghana, January 1st to December 31st 1986.

Region	Male	Female	Total
Eastern ..	6	61	67
Greater Accra ..	4	17	21
Brong Ahafo ..	2	7	9
Central ..	0	6	6
Ashanti ..	0	6	6
Western ..	1	2	3
Volta ..	—	2	2
Northern ..	—	—	—
Upper East ..	—	—	—
Upper West ..	—	—	—
No Information ..	—	1	—
Total ..	13	102	115

TABLE 5: Travel History of 115 Seropositives tested in Ghana from January 1st to December 31st 1986.

Country	Male	Female	Total
West Germany ..	1	1	2
Cote d'Ivoire ..	7	74	81
Burkina Faso ..	—	3	3
Senegal ..	—	1	1
No Information ..	4	20	24
Never travelled ..	—	4	4
Total ..	12	103	115

TABLE 6: Status of 1095 Ghanaians tested for HIV antibodies from November 1985 to December 31st 1986.

	No. Tested	No. Positive	% Positive
<b>I. Healthy People</b>			
(a) Blood donors .. .. .	288	0	0
(b) General/lab. workers/medical exams. etc. .. .. .	168	0	0
(c) Prostitutes working locally in Accra/Tema .. .. .	162	4	2.5
(d) Returnee from Cote d'Ivoire .. .. .	1	1	100
<b>II. Diseased People</b>			
(a) Sexually transmitted diseases .. .. .	64	3	4.6
(b) Prostitutes working in Cote d'Ivoire .. .. .	105	52	49.5
(c) Employment not stated .. .. .	46	22	47.8
(d) C.S.M. .. .. .	46	0	0
* (e) Others .. .. .	215	33	15.3
Total .. .. .	1095	115	10.5

\*These include male returnees from Cote d'Ivoire, female prostitutes from other West African Countries,

Table 3 shows the clinical status. Eighty-seven (75.6%) were ill either with full blown AIDS or with AIDS related complex. The numbers of seropositives occurring in different parts of Ghana are shown in Table 4. Sixty-seven (58.3%) were from Eastern Region, particularly from the Koforidua area. These represented more than half the total of positives occurring in all other parts of Ghana. There was history of recent residence or extended visits abroad in 96% of seropositives. Table 5 shows the countries named. Most of those claiming recent residence abroad had been to Cote d'Ivoire, in particular the capital, Abidjan. Four stated that they had never travelled abroad.

Studies done on random samples of the general population resident in Ghana showed that most people were seronegative. Of 288 blood donors and 168 laboratory workers tested in November 1985, none were seropositive. None of 46 patients from the Volta Region with cerebro-spinal meningitis were positive. Of 64 patients at a clinic for venereal diseases in Accra 3 were positive all of whom were returnees from Code d'Ivoire. Of 136 prostitutes from Accra and Tema surveyed in February 1986 only one was positive. Later in the year an additional 26 prostitutes working locally were tested and 3 were found to be positive. Table 6 shows the clinical status of 1095 Ghanaians tested for HIV between November 1985 and December 1986.

### Discussion

Unlike other diseases, seropositivity for antibodies against HIV does not offer protection against the disease<sup>6</sup>. It is merely an indication that infection has occurred, so

seropositivity can be used as a measure of infection for those people who can spread the disease by sexual contact, both heterosexual and homosexual<sup>7</sup>. Needles contaminated with the patient's infected blood and then injected into other people can transmit HIV<sup>8,9</sup>. Blood from an infected person transfused into another person can transmit HIV to the recipient<sup>10</sup>. A pregnant seropositive woman can also transfer the virus to her unborn child<sup>11</sup>. It is estimated that about 20-50% of infants of HIV positive women are born infected. The 2 infants in our series were born to seropositive mothers. There is evidence that HIV infection may be transmitted in breast milk<sup>12</sup>. HIV infection has also been reported to have been spread by artificial insemination of semen in infertile mothers<sup>13</sup>. In Ghana, we have also to consider traditional practices like scarification or ritual circumcision with contaminated knives as potentially infectious. However, it is thought not to spread to household contacts<sup>14</sup> and there is no evidence at the present time that mosquito vectors can spread the disease.

The natural history of HIV infection is that seroconversion usually occurs 2-8 weeks after infection (rarely as long as 6 months)<sup>15</sup>. About 30% of seropositive people become ill after 1-7 years with AIDS or AIDS related complex<sup>16</sup>, and at the present time all those patients developing AIDS are likely to die, as there is no known cure. The length of time the asymptomatic carrier state persists is unknown, as more people continue to fall sick with AIDS as they are followed up. Around each patient who is known to have AIDS, there is a pool of infectious seropo-

sitive carriers who can spread the disease to other people, while remaining healthy and probably unknown to medical practitioners or to other sexual partners. It is these healthy carriers who are the danger to the society. Most of the seropositive people reported here were ill, too ill to spread the disease by sexual contact, but some were healthy and were detected incidentally. The prostitutes working locally were healthy and one admitted to having about 4 clients a week.

It is of interest that 89.6% of our seropositives were females. This is the first time that this has been reported to be the case. In the U.S.A. most cases of AIDS are males, as the disease spread initially amongst male homosexuals who were very promiscuous<sup>16</sup>. In Central Africa where the spread has been mainly heterosexual an equal sex incidence has been reported<sup>17</sup>. The peak incidence in our cases occurs in the sexually active age group. We explain the female preponderance by the occupation of the patients, many of whom admitted that they had gone abroad, particularly to Abidjan, Cote d'Ivoire to practice prostitution. Female prostitutes in Nairobi have been shown to be particularly at risk, and this risk increased with the number of clients per annum with whom they had sexual contact<sup>18</sup>. It is likely that the Ghanaian women acquired infection abroad, since a previous study showed a very low infection rate in Ghanaian prostitutes working locally<sup>19</sup>. Some of the women become ill while working as prostitutes in Cote d'Ivoire and when they could no longer work, came home to Ghana hoping for medical treatment. In some cases they were so ill that they died soon after arrival. At least one woman had to be carried by fellow passengers on the bus as she was so weak. Some of the seropositive males returning from Cote d'Ivoire admitted to sexual contacts with prostitutes working there.

A study prevalence of HIV in Cote d'Ivoire carried out between January and May 1986<sup>20</sup> showed a seropositivity rate in prostitutes varying between 6.9% in a northern town called Tortiya to 26.2% in an economically depressed area of Abidjan. The same study showed an incidence of 3.3% in pregnant women, and 2.1% in prison staff. These groups were thought to represent a sample of the general population. Of the 232 prostitutes tested 114 were from Ghana and it may be some of these women, returning to

Ghana, that we are detecting here. The authors also comment that sera collected from Cote d'Ivoire between 1975 and 1983 were negative for antibodies to HIV and conclude that it is a new infection there, as we have demonstrated here. They also conclude that it has been brought into Cote d'Ivoire from other infected areas of the world.

The regional distribution of the seropositives as seen in Table 4 is of interest in that the highest number came from the Eastern Region, particularly from the areas around Koforidua. It might have been expected that the capital city, Accra, would have the highest incidence, because of the greater number of night-clubs and similar establishments and also possibly because of more ready access to medical facilities. We explain this finding by the fact that most of the females who had been working in Cote d'Ivoire as prostitutes returned to their homes in the Eastern Region. It is likely that the number of seropositives reported from Accra is actually too high, as there is a possibility that some patients were referred to hospital in Accra where they were tested on clinical grounds. The apparent rise in incidence over the months from zero in February to 31 in September (Table 1) could have been a true rise or it could have been as a result of the education campaign which was going on, so that referring doctors became better informed.

The fact that most of the people have probably acquired infection abroad is reassuring in one way, as it means that in Ghana at the present time there may not yet be the huge reservoir of healthy carriers that has occurred in other countries later during the epidemic spread of the disease. In the United States for example it is estimated that for every case of AIDS there are 100 symptom-free virus carriers<sup>21</sup>. At the same time there is no place for complacency, since we have demonstrated the presence of a few healthy carriers, 4 of whom were prostitutes working locally and actively spreading the disease. It is also possible for an asymptomatic carrier working abroad to come home for holidays or business and unwittingly to spread infection. We therefore recommend that various measures should be instituted as a matter of urgency if Ghana is to escape the ravages of AIDS epidemic that is occurring in East and Central Africa. In Uganda, for

example, in 1986 in Kampala 12% of blood donors and healthy antenatal women were positive<sup>22</sup>. These measures include educating the general public about the modes of spread of HIV infection, particularly by promiscuous sexual behaviour, and to advise people to refrain from casual sex, particularly with prostitutes. Prostitutes themselves should be educated and rehabilitated. Further studies should be undertaken into peoples attitudes and practices to form the basis of the education campaign. Measures should be taken as soon as possible by the health authorities to prevent spread by infected blood products, for example by blood transfusion. HIV screening in blood banks should be instituted. Adequate supplies of needles for injection, stylettes for blood testing, disinfectants and surgical gloves for medical nursing and laboratory staff handling infected blood should be made available by the Ministry of Health. The HIV is inactivated by heat so if needles have to be reused, for example in rural areas, they should be autoclaved or boiled at 100°C for 20 minutes. If preventive measures are not taken urgently, then Ghana could expect an explosion of AIDS in the community 2-3 years from now.

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