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UNIVERSITY OF GHANA

SPATIAL PATTERNS OF ACQUIRED IMMUNE  
DEFICIENCY SYNDROME (AIDS) IN THE ACCRA  
METROPOLITAN AREA (AMA)

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A THESIS

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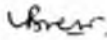
FEBRUARY, 1996

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## DECLARATION

I certify that this thesis is my own original work that has been produced by research and under supervision. Where references have been made, or cited, of other views they have been adequately acknowledged. Furthermore, this thesis has neither been presented in whole or in part to any other institution for any degree.



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## ABSTRACT

Nearly two decades into the outbreak, the HIV/AIDS epidemic has spread throughout sub-Saharan Africa with complex spatio-temporal variability within countries. Based on epidemiological evidence, several broadly distinctive HIV/AIDS prevalence patterns have been reported reflecting a variety of factors such as sophistication in surveillance systems, political attitudes, openness towards recognition, and release of AIDS information. This thesis examines the geography of clinical AIDS in the Accra Metropolitan Accra (AMA) using epidemiological evidence. Available data on contacts and sexually transmitted disease histories of infected people are used to reconstruct AIDS dispersal from geographical perspectives to ascertain the spread patterns in Accra. It is observed that the epidemic has become more diffused and has spread from among the initial 'high risk groups' to the general population. Reported evidence points to a possible increase in intensity in the coming years since the co-factors (e.g. STD, unsafe sex) and the forces (e.g. poverty and increasing mobility) that impel the spread of the epidemic persist. In the absence of a medical cure, a major public health problem and a generalised spread pattern are predicted if there are no social interventions.

## TABLE OF CONTENTS

TITLE PAGE	II
DECLARATION	IV
ACKNOWLEDGMENT	V
ABSTRACT	VII
CHAPTER ONE	1
INTRODUCTION AND CONCEPTUAL FRAMEWORK	1
1.1 INTRODUCTION	1
1.2 STATEMENT OF THE PROBLEM	6
1.3 LITERATURE REVIEW	8
1.4 CONCEPTUAL FRAMEWORK	20
1.5 OBJECTIVES AND RATIONALE	24
1.6 HYPOTHESES	25
1.7 CHAPTER ORGANISATION	26
CHAPTER TWO	28
RESEARCH DESIGN AND METHODOLOGY	28
2.1 THE STUDY AREA	28
2.2 RESEARCH INSTRUMENTS	30
2.3 SAMPLING FRAME	31
2.4 DATA ANALYSIS	32
2.5 LIMITATIONS AND CONSTRAINTS	33
CHAPTER 3	35
EPIDEMIOLOGY OF AIDS IN ACCRA	35
3.1 DEFINITION OF AIDS	35
3.2 HIV INFECTION AND AIDS	36
3.3 RISK FACTORS	39
CHAPTER 4	44
SPATIAL PATTERNS AND MAPPING	44
4.1 MAPPING	44
4.2 OBSERVED PATTERNS	44
4.3 GENDER AND AGE CHARACTERISTICS	46
4.5 HISTORY OF TRAVEL	52
4.6 OTHER PATIENT CHARACTERISTICS	54

CHAPTER 5	56
FACTORS UNDERLYING OBSERVED SPATIAL PATTERNS	56
5 1 SPATIAL DIFFUSION	56
5 2 SEXUAL NETWORKING	57
5 3 RETURN OF MIGRANTS	59
5 4 RESISTANCE TO AIDS SPREAD	61
CHAPTER SIX	63
COMMON PERCEPTIONS AND ATTITUDES	63
6 1 PERCEPTION	63
6 2 ON STDS AND SAFER SEX	64
6 3 AIDS AWARENESS	65
6 4 COPING WITH AIDS	67
6 5 AIDS IN THE COMMUNITY	70
6 6 MANAGEMENT OF AIDS	71
CHAPTER SEVEN	73
SUMMARY AND CONCLUSIONS	73
7 1 OVERVIEW	73
7 2 AIDS CONTROL MEASURES	74
7 3 DEATH AND BEREAVEMENT	75
7 4 PLANNING FOR THE FUTURE	76
7 5 CONCLUSION	77
BIBLIOGRAPHY	81

## LIST OF FIGURES

FIGURE 1 AIDS NORTH-SOUTH HYBRID DIFFUSION PATTERN.....	22
FIGURE 2 THE ACCRA METROPOLITAN AREA (AMA) 1991 .....	28
FIGURE 3 REPORTED CUMULATIVE AIDS CASES IN GHANA BY YEAR OF REPORT 1987-1996.....	37
FIGURE 4 REPORTED AIDS CASES AT KORLE-BU TEACHING HOSPITAL IN OCTOBER 1996 BY RESIDENCE IN ACCRA.....	45
FIGURE 5 REPORTED AIDS CASES AT KORLE-BU TEACHING HOSPITAL IN OCTOBER 1996: GENDER BY RESIDENCE IN ACCRA .....	47
FIGURE 6 REPORTED AIDS CASES AT KORLE-BU TEACHING HOSPITAL IN OCTOBER 1996 AGE BY RESIDENCE IN ACCRA.....	48
FIGURE 7 REPORTED AIDS CASES AT KORLE-BU TEACHING HOSPITAL IN OCTOBER 1996 OCCUPATION BY RESIDENCE IN ACCRA .....	50
FIGURE 8 REPORTED AIDS CASES AT KORLE-BU TEACHING HOSPITAL IN OCTOBER 1996: HISTORY OF TRAVEL BY RESIDENCE IN ACCRA.....	53

## LIST OF TABLES

TABLE 1 ESTIMATED GLOBAL DISTRIBUTION OF CUMULATIVE HIV-INFECTIONS, AIDS CASES AND ASSOCIATED DEATHS .....	2
TABLE 2 AIDS CASES IN GHANA BY AGE AND GENDER.....	7
TABLE 3 SEVEN RESIDENTIAL SECTORS OF ACCRA CLASSIFIED BY SOCIAL AND ECONOMIC SIMILARITIES .....	29
TABLE 4 THE PROPORTION OF POPULATION RESIDING IN THE SEVEN RESIDENTIAL SECTORS .....	30
TABLE 5 REPORTED HIV+ CASES IN GREATER ACCRA REGION BY DISTRICT AS AT AUGUST 1993 .....	39
TABLE 6 STD HISTORY REPORTED BY THE GENERAL PUBLIC.....	64
TABLE 7 REPORTED POST-AIDS SEXUAL HABITS IN THE GENERAL PUBLIC .....	65
TABLE 8 REPORTED PATIENTS' RESPONSE TO THEIR CONDITION OF AIDS .....	68

## CHAPTER ONE

### INTRODUCTION AND CONCEPTUAL FRAMEWORK

#### 1 INTRODUCTION

In June 1981, the United States Centers for Disease Control (CDC) received reports of young men suffering from a range of diseases atypical of their age group such as pneumonia, Kaposi's sarcoma, lymphadenopathy syndrome (LAS) and various other opportunistic infections. Those affected by these diseases gradually wasted away and did not respond well when treated. An alarming picture of a new disease began to form and in 1982, the Centers for Disease Control (CDC) identified these symptoms as Acquired Immune Deficiency Syndrome (AIDS) the final and fatal stage of infection with the Human Immunodeficiency Virus (HIV). The first research linking AIDS with the human immune system was published in late 1981 (Learmonth, 1988; WHO Global Factfile, 1989). Two years later research groups in France and the US almost simultaneously found the cause of AIDS to be a human retrovirus (Gallo and Montagnier, 1989).

AIDS consists of a breaking down of the body's immune system, which leaves it vulnerable to opportunistic infections that would normally be treatable. Today, the AIDS epidemic has reached global proportions and according to UNAIDS by 30 June 1996, approximately 1.4 million cumulative cases of AIDS in adults and children had been officially reported by countries worldwide. This represents an increase of approximately 19 per cent over the

1,169,811 cases reported by the same date in 1995. However, taking into account under-recognition, under-reporting and reported delays, it is estimated that more than 7.7 million AIDS cases have actually occurred since the start of the global epidemic (See table below).

Table 1 ESTIMATED GLOBAL DISTRIBUTION OF CUMULATIVE HIV-INFECTIONS, AIDS CASES AND ASSOCIATED DEATHS

People living with HIV/AIDS	21.8 million
HIV/AIDS-associated deaths in 1991	1.3 million
Cumulative HIV infections	27.9 million
Cumulative AIDS cases	7.7 million
Cumulative HIV/AIDS deaths	5.8 million

*Source: UNAIDS, June 1996*

An appropriate indication of the trends in the globalization of AIDS is the number of new infections with HIV. The UNAIDS estimates that more than 3.1 million new HIV cases were expected to occur in 1996. This would mean an average of about 8,500 new infections every day. Table 1.1 shows that from the beginning of the epidemic, about 28 million people have been infected with HIV. Among the infected, an estimated 5.8 million people have died, 21.8 are either living with the virus or have full-blown AIDS. As the number of those infected continues to increase, finding a cure or vaccine looms as one of the greatest challenges to modern science.

The prevalence of infection is estimated from blood tests performed on non-random samples of blood in limited areas. Figures for these tests are difficult to

extrapolate for entire countries. Mann et al (1989) report that the figures for Africa are probably under-estimated since there could well be a substantial number of cases not reported to official sources. They further estimate that about 90 per cent of African AIDS cases are not reported. Some scientific and media descriptions of AIDS have indicated that the African continent is more at risk than any other continent. It has even been reported that the "AIDS problem in Africa is very sharp and pointed; the whole continent is like that" (West Africa 6-12 June 1994:991).

However, there is contrary evidence that HIV levels are very low in some parts of Africa notably Nigeria in spite of the fact that it boasts about half the population of West Africa, a quarter of the continents inhabitants, and is one of the major crossroads of Africa. The first case in Nigeria was reported in 1987 and less than 200 cases have yet been identified in almost 100 million people (Olaleye, 1993; Caldwell, 1993). Analysis of blood samples mostly from urban areas, hospital patients and special groups in Nigeria is consistent with a seroprevalence rate in the country not higher than 0.5 per cent (Olaleye et al , 1993; Caldwell and Caldwell, 1993). Even where local experts from Nigeria confirm with seropositivity studies that there is not yet an AIDS problem in their country, they are shouted down with "Under-reporting!" (Konotey-Ahulu, 1994)

While there can be no doubt that there are cases of HIV and AIDS in Africa, to regard the situations in Tanzania, Sierra Leone, Rwanda and Gambia as so much the same and to claim that due to the rising tide of AIDS in Africa "vast

areas of populated land would be devoid of a single person within 10 years"<sup>1</sup>  
would seem outrageous

Most of the discussion surrounding the AIDS epidemic has focused on the devastating human toll and the serious strains that no doubt will be placed on national health care systems. However, as many developing countries particularly the poor economies of sub-Saharan Africa are already discovering, the epidemic is not solely a medical issue. Rather, it threatens to alter dramatically the economic and social arrangements of many societies, raising questions about the development process itself. Although not the biggest killer compared to childhood diseases, respiratory ailments, diarrhoea and malaria, AIDS predominantly strikes young and economically productive adults. Moreover, given the large number of individuals infected with the HIV, AIDS may well turn out to be an even more serious problem in the years to come.

HIV can be transmitted in three ways: sexual intercourse, transfusion of infected blood and pregnant woman to foetus or lactating mother to baby. Sexual transmission of HIV accounts for approximately 80 percent of all global HIV infections. Of these only 10 percent is estimated to have been due to homosexual exposure (Armstrong, 1991). For sexual transmission in general, a study published in the British Medical Journal (1994) by the European Study Group on AIDS concluded that the only sexual practice leading to an increased risk of HIV infection for men or women was receptive anal intercourse.

<sup>1</sup> quoted from an article in Sunday Express, 1986

Transmission by infected blood may be through blood transfusion, contact with HIV - contaminated drug injecting equipment or needle-prick exposure

Researchers also know that progression from the time of infection with the virus to the onset of full-blown AIDS is not immediate. In fact, HIV has a long incubation period ranging from 6 months to about 10 years, during which time infected individuals may show no signs of being ill. For children, however, the time from infection to developing AIDS is much shorter, usually 5 years. Average survival after the onset of AIDS for both adults and children in developing countries is less than one year (Armstrong, 1991).

In many areas of sub-Saharan Africa, the prevalence of HIV infection is high, and male and female are equally affected. The national prevalence in Sub-Saharan African countries is estimated at between 2 and 4.5 per cent of the entire population (WHO, 1988). Studies of selected populations in some cities of Central and East Africa have found prevalence as high as 30 per cent (Bizimungu *et al.*, 1989)

The groups of societies most affected in Sub-Saharan Africa are different from those affected in Europe and North America. Homosexuality, if it exists at all, is rarely owned up to in Africa, and drug addiction is rare. Pregnant women, blood donors and people with multiple sexual partners such as prostitutes and their clients are increasingly becoming infected. Most of the recorded cases in the population are prostitutes and heterosexuals, and infection is generally common in the towns than in the countryside (deLalla *et al.* 1988). However, in some

areas, the disease is as common in the countryside as in the towns. For example, in 1983, HIV infection was virtually absent in the rural East Acholi district of Northern Uganda. By 1986, 14 percent of the district's health centre outpatients and 13 percent of its otherwise healthy people were reported to have been infected (deLalla, et al. 1988).

At present, AIDS is likely to double or even triple the total adult mortality in urban areas of some parts of Africa. Already AIDS patients fill some 25 to 50 percent of beds in some hospitals in Central Africa (Mann et al., 1988). Child mortality in sub-Saharan Africa is expected to increase by at least 25 percent as a result of AIDS (Mann et al. 1988) and this has the potential of wiping away the gains of child survival programmes.

## 1.2 STATEMENT OF THE PROBLEM

There is increasing concern about an AIDS epidemic in Ghana predominantly affecting young people. Estimates indicate that the virus already infects some 18,730 people, and it is projected to increase further by the turn of the century (MOH, FEB 1996). The age and gender distribution of AIDS cases is shown in Table 2 below. There are very few cases among children aged 0-14 years old. The highest proportion of infected people is between 20 and 39 years old.

Table 2 AIDS Cases in Ghana by Age and Gender

March 1986 - June 1996

AGE GROUP (YEARS)	FEMALE (Number)	FEMALE %	MALE (Number)	MALE %	TOTAL (Number)	TOTAL %
0 to 4	143	1.1	130	2.1	273	1.5
5 to 9	21	0.2	23	0.4	44	0.2
10 to 14	16	0.1	15	0.2	31	0.2
15 to 19	379	3	36	0.6	415	2.2
20 to 24	1993	16	310	5	2303	12.3
25 to 29	2952	23.6	1128	18	4080	21.7
30 to 34	2491	20	1507	24.1	3998	21.3
35 to 39	1787	14.3	1278	20.5	3065	16.4
40 to 44	1045	8.4	671	10.7	1716	9.2
45 to 49	672	5.4	533	8.5	1205	6.4
50 to 54	460	3.7	266	4.3	726	3.9
55 to 59	191	1.5	125	2	316	1.7
60+	195	1.6	149	2.4	344	1.9
not stated	138	1.1	76	1.2	214	1.1
total	12483	100	6247	100	18730	100

[Source MOH, Accra, June 1996]

If it is true that half of the reported cases of AIDS in the Accra Metropolis between 1986 and 1996 are already dead, (MOH, 1996) then perhaps AIDS may dominate other considerations in Ghana's present and future health

Existing work on the transmission dynamics of HIV has focused attention on who and how many people suffer from the disease, the structure of networks of sexual contacts, gender and power relations in society and the potential demographic implications of AIDS. This is a reflection of the interests of medical scientists, epidemiologists and demographers that are currently in the frontiers of AIDS research. Not much interest has been shown in the identification of AIDS regions to highlight variations in socio-domestic and ecological factors that seem to

promote differentials in AIDS incidence. The geographer's interest in the region, disease ecology and diffusion studies, location and allocation of health resources, the utilization of appropriate health interventions and the use of maps for illustration, are required to make a more meaningful contribution to health planning and development.

The thesis assumes that the AIDS picture in the Accra metropolitan area is underlain by patterns of high-risk sexual behaviour, which may show variation among the different residential sectors. The identification of high and low risk AIDS sectors of the metropolitan area is the focus of this study.

### 1.3 LITERATURE REVIEW

A great deal of research has been carried out on HIV and AIDS, including a number of efforts to determine the origin and to produce reliable estimates of the growth and diffusion of the HIV epidemic. According to Konotey-Ahulu (1989) the question of the origin of the AIDS virus has been answered by hypothesis rather than fact and the origin of the virus has sometimes been treated to a three-tier hypothesis, that is hypothesis based on hypothesis based on hypothesis. He further comments that a two-tier hypothesis is bad enough and so a three-tier model should not be worthy of serious consideration. However, because they are propounded by acknowledged scientists these hypotheses are elevated to the status of fact.

That AIDS originated from Africa; that it was produced accidentally during a biological warfare genetic engineering experiment, that it was released through

male-male sexual involvement and that it was transmitted from monkey to man are some of the hypothetical speculations not based on any conclusive evidence

The data needed in epidemiological variables usually include disease-specific factors that provide fundamental information for estimating the necessary parameters. In most diseases, these parameters are well known or can be reliably estimated from existing data or by analyzing a representative sample of case histories. Thus modelling of the growth curves of diseases and their spatial diffusion processes have been done with a high degree of accuracy (Loytonen, 1991).

With the HIV epidemic, the situation is somewhat difficult. The features of the virus and its connection to drug abuse and various forms of human sexual behavior cause a lack of basic epidemiological data needed for the estimation of the parameters about this problem in general (Altman 1987; Layne et al 1988; Gill et al 1989). This is because in most countries there are no systematically compiled data available about HIV-positive patients with or without symptoms. Most of the literature dealing with the epidemiological aspects of HIV is based on data covering only patients with AIDS and possibly also persons with AIDS Related Complex (ARC). That dealing with HIV carriers with no symptoms is usually based on samples drawn from populations known to have a higher rate or risk behavior, such as prostitutes, homosexuals and intravenous drug users.

Given the data problems it is not surprising that many estimates of the growth of the epidemic based on traditional epidemiological models as well as attempts to

estimate the growth curve of AIDS cases by using simulation techniques have proved to be less successful than desired (May and Anderson, 1987; Adler and Piot, 1988). As long as more precise epidemiological parameters needed in modelling the epidemic remain unknown, existing models will only yield rough estimates of the growth curves. Consequently, the reliability of the different growth estimates has become a subject of continuous discussion (Heisterkamp et al. 1989; Delamothe, 1990; Rees, 1990).

Two major methods are commonly used to explain spatial variations in disease incidence. The first is to identify the natural foci of the disease, with emphasis on such environmental factors as climate, biotic and biological conditions, which suggest "disease regions". This method primarily involves determining the importance of environmental factors in the development and survival of the primary disease agents. The second approach emphasizes secondary disease agents, which are usually related to human or host factors (Iyun, 1983). Thus, health hazards can be interpreted by the association of artificial factors, that is, properties of differential living conditions rather than the 'natural' foci of diseases (Shannon and Spurlock, 1976). The socio-economic characteristics which contribute significantly to the cause and spread of many diseases may therefore include age, sex, ethnic group, behaviour and lifestyle (Iyun, 1983). These socio-economic variables therefore influence the patterns of morbidity and are responsible for spatial variations in morbidity levels.

From the result of her analysis on Ibadan City, Nigeria, Iyun (1981) asserts that people in the low-income bracket suffer particularly from communicable and

poverty-ignorance-associated diseases. Besides, age group, occupation, religion, population and accommodation densities appear to be significant determinants of differences in the level of illness of the disease's victims.

The proposition that secondary factors such as differential living conditions rather than natural biological factors should be emphasized in the interpretation of health hazards (Shannon and Spurlock, 1976; Iyun, 1983) is considered relevant in determining the prevalence and distribution of AIDS in the Accra metropolis. Of the several socio-economic variables relating to age, gender, ethnic background, sexual behaviour and so on, differential living conditions within residential areas is postulated in this study as the most important co-factor responsible for variation in AIDS prevalence in the Accra metropolis.

Gardner et al. (1989) analyzed the spatial diffusion of HIV in the United States of America (USA). Using that country as the spatial unit, they found a relatively clear pattern of diffusion from areas with relatively high prevalence to those with relatively low prevalence. The diffusion process depicted expansion diffusion in all the study areas and a clear indication of a mixture of expansion and hierarchical processes. They concluded that their data provided compelling evidence for the existence of substrate-level epidemics growing spatially and temporally into areas close to the original epicenters. Dutt et al. (1987) also analyzed the geographical patterns of AIDS in the USA based on the prevalence of reported AIDS cases. They showed that the association of AIDS prevalence by source displayed distinct regional variation while incidence by age cohort displayed a uniform pattern. However Winn's (1988) case study of AIDS in the

West Midlands (United Kingdom) was unable to show any regional patterns in the distribution of AIDS cases.

While Gardner et al . (1989) considered the whole of the United States as a spatial unit, this study will consider the Accra Metropolis, a much smaller geographical area, as its spatial unit, and will, like Dutt et al (1987), concentrate only on reported actual cases of AIDS. Like Gardner and Dutt, it will also investigate the nature of diffusion spatially and temporally and map out any local patterns of distribution.

Similarly, Loytonen (1991) analyzed the development of the HIV epidemic in Finland in 1982-88 using spatial interaction variables to predict further growth through 1997. He placed emphasis on identifying the possible factors affecting the spatial diffusion of HIV in Finland. To predict the future course of the epidemic, these factors were used to build a probability surface, which defined the spatial variation of the risk of obtaining the infection in Finland. Loytonen applied a simulation technique to predict the diffusion process. The use of such a design provided a generally applicable method adopting traditional geographical data. This method will be applied to Accra in this study. A model-based approach such as Loytonen's also provides the possibility of modeling comparative analysis between countries in different epidemiological phases.

Of central importance about the spread of AIDS are not the identity of persons involved but the extent of multiple sexual partners. Little is known about past networks of sexual contacts in Sub-Saharan Africa although there is some

evidence about substitution for wives during post-partum abstinence, which is institutionalized in some societies (Caldwell et al. 1989). These patterns may be changing. The 1974-75 Nigerian Family Study on post-partum abstinence in Ibadan city and its peri-urban areas showed that husbands had multiple girlfriends or visited bar girls or prostitutes. Some wives had worries about their husbands establishing long term relationships with such women (Caldwell et al., 1989).

Caldwell (1980) argued that there are no figures anywhere on what proportion of male multiple sexual contacts are with prostitutes or other women with a large number of additional sexual partners. However, there are figures showing some Nairobi working class area prostitutes averaging nearly 1,000 sexual contacts per year (Dawson, 1988:62), but this does not necessarily imply a thousand different partners. Quantitative reports from West Africa and elsewhere in Africa appear to suggest much lower frequencies (Caldwell et al. 1989).

To ascertain the true nature of sexual networks within the Accra metropolis, it would seem ideal to question special groups such as men with nursing wives and those traveling to Accra in search of jobs, as well as prostitutes, bar girls and girlfriends. It will be practically difficult to identify, especially men, who either have nursing wives or are in search of jobs. Hence, the focus will be on bar girls and prostitutes as well as loiterers and those who hang around places noted for popular entertainment and leisure.

On the origin of AIDS, Shannon, Pyle and Bashshur (1991) acknowledged the lack of hard scientific evidence to support the various origin theories and argued that it did appear plausible to suggest that HIV infection in the United States resulted from tourism and travel to Europe and Haiti. They however, contradicted themselves in contending that the geographical patterns observed globally provide additional evidence that the HIV did not originate in Europe but in the USA and Africa. In a review, Shannon et al., (1991) and Matthews (1992) commented that the contradiction in their study was perhaps an illustration of the complexity of the question of origin but credited them for illustrating the value and utility of social inquiry. On the geography of AIDS, Shannon et al., (1991) admitted that their treatment of the subject may not satisfy many 'theoretical geographers'. They also reminded of the need to search below the broad patterns of the epidemic and interrogate available data at finer spatial scales.

Wood (1988) reviewed AIDS and its transmission and proposed AIDS-North, AIDS-South and AIDS-North-South hybrid diffusion paradigms to assess the nature of the disease in various regions of the world. AIDS-North describes AIDS in North America and Western Europe as urban-based and primarily confined to homosexuals and intravenous drug users, while AIDS-South describes AIDS in Central Africa and the Caribbean as spreading from cities into rural regions affecting mostly heterosexuals. The AIDS North-South hybrid pattern describes AIDS in other developing countries where there is migration between infected and uninfected areas especially by people in the high-risk category. Wood used the three paradigms to assess spatial patterning of HIV seropositivity and actual cases of AIDS, the diffusion of HIV and AIDS through

time, space and age structure, and the spatial analysis of behaviour patterns of infected people.

Wood's concern for spatial relationships, patterns, movements, and what they influence has guided the choice of the AIDS North-South hybrid model to assess the situation of HIV/AIDS in Accra. A conceptual model of the diffusion process sometimes described as the 'truck town hypothesis' (Smallman-Raynor et al., (1992:151) is presented in the conceptual framework in section 1.4. The model envisages three levels in the urban hierarchy: an upper section of primary cities with principal road connections; an intermediate section of markets and towns proximal to major roads and commuting trucks; and a lower section of villages. The model is founded on geographically mobile and sexually active population of truck drivers, who regularly travel along the roads. These drivers are assumed to make frequent contact with prostitutes and other females, both at stopping points in primary cities and in intervening middle order settlements. The nexus of long-distance travel and sexual contact diffuses HIV in a hierarchical and bi-directional manner between two upper sections of the urban hierarchy situated along the roadway. The second stage of the process of spread involves cascade, uni-directional diffusion down the urban hierarchy from truck towns to rural villages. Workers migrating from villages to towns and cities carry HIV back to rural areas by a process of returning migration (Wood, 1988).

The diffusion patterns presented in Wood's AIDS north-south regions are the conceptual basis for assessing the process of spreading AIDS in Accra (see section 1.4). A major weakness in adopting these patterns is that they are rather

generalized and simply sketch the dynamics of a disease that is rapidly spreading in a variety of ways within and among world regions. Local conditions may probably have some unique characteristics not considered by the paradigm.

Jeanneney (1987) held that the range of present attitudes to AIDS is very similar to the range of attitudes held about syphilis from the 1880s right up to the 1940s when penicillin was invented. These attitudes demonstrate very clearly how scientists, the public, the media and politicians have interacted to produce a collective emotional hysteria that is unwarranted by the facts surrounding the disease. As was shown by the story of syphilis, such emotions can result in the release of racist and class prejudices. The obsession about syphilis in those days led to irrational beliefs in the most improbable forms of transmission. According to Jeanneney, anyone looking at the fantasies currently carried in the press about the transmission of AIDS will find himself on familiar ground if he is acquainted with the statements of medical authorities around 1900 with respect to "syphilis of the innocents". Jeanneney further points out that the anxiety about venereal diseases at the start of the 20th century led to the denial of individual freedom. There was clearly a manifestation of fear. In the same way, people nowadays have often searched for some scapegoats by talking about the possibility of an African origin of AIDS. Similarly, around 1890, a large part of the literature devoted to syphilis was racist. Further along this path was the idea that civilization and travels had by themselves allowed the extension of the scourge, against which the closed life of rural families in older times was a protection.

To broaden the view a little, Jeanneney observed that fear was deliberately put in the service of an ideology of degeneration and of the decadence of the race. The notion of hereditary syphilis, which flourished in those early years and the spread of which was considerably helped by certain doctors obsessed with the idea, ended with the attribution of all malformations and monstrosities to syphilis. These notions gradually developed, again for political purposes, into the notion of democracies corrupted by disease.

Concluding, Jeanneney remarked that these examples of how people reacted to syphilis should warn that we may be imposing our own political and moralistic judgments on those afflicted with AIDS. This should not be so because there is enough scientific data, more authentic than before and virtually free of the rubbish often spoken by sensationalists. Yet, Jeanneney questioned whether the danger of deliberately obscuring the truth is really so far from our own situation today. While the threat of AIDS means that educational campaigns are needed to show the danger in sexual networking, such publicity should not allow people within the high-risk category to be pictured as the source of distress and evil.

A number of African physicians perceive the panic over AIDS as a hoax. Konotey-Ahulu (1989) in particular assessed the epidemic in several African countries and reported in *Lancet* thus 'if tens of thousands are dying from AIDS (and Africans do not cremate their dead), where are the graves?'

In 1987, a preponderance of females with AIDS was reported for Cameroon (Monny-Lobe et al., 1989). Similar scenarios were reported in Gabon, Equatorial

Guinea, and the Central Africa Republic in 1989. Before them all, Neequaye et al., 1986 had made findings about female preponderance with AIDS in Ghana. Quartey et al., (1988) reported that until 1988 all AIDS patients from the Krobo ethnic area were female and they were all without exception international prostitutes from neighbouring Abidjan, Cote d'Ivoire, from where they had been sent home to die. The first ever Krobo adult male with AIDS was seen in February 1988 and he doubled as husband and manager of one of the prostitutes who had returned from Abidjan with AIDS.

Konotey-Ahulu also reported in 1989 that every African adult male that he had seen with AIDS on the African continent admitted having had sex with an international prostitute. Besides, the regions in Africa with high AIDS concentration have all been associated with female migration. The only occasions when more males than females are found to have AIDS are when hospital attendance and admissions rather than domiciliary surveys are used for statistics. It is a known fact that female patients in Africa, many of whom are mothers, attend hospital far less with the same complaints which drive men to visit clinics (Konotey-Ahulu, 1989). The AIDS situation in Africa is thus a reflection of how many females, ranging from school girls roaming the streets of Lusaka to young mothers hanging around hotels in Bujumbura, Kigali, Dar-es-Salaam, Nairobi, Harare and older women in Lagos, Abidjan and Dakar, are renting their bodies for currencies. An all-important emerging factor in the spread of AIDS in Africa is as described by "The Times" of London (June 23, 1988 p 19), 'money to spend, and women to spend it on'.

Anarfi (1992) suggested that in the absence of a cure that will respond to high risk activity and patient care needs, intervention programmes should extend beyond mere awareness creation to include mechanisms for coping with the disease within the family and the society at large. There is certainly a need for social counseling and psychic support. Community education is also needed to reduce the level of blame and shame, and families must be helped to accept their sick relatives with love and concern instead of the feeling of embarrassment.

There is fair agreement that AIDS patients are cared for by their families than any other group of people or individuals (McGrath *et al.*, 1991, Ankrah, 1992; Anarfi, 1992). McGrath and Ankrah maintain that the burden mainly falls on females, namely mothers, sisters, daughters, aunts, grandmothers and wives. Females are thus at the forefront in the coping mechanisms at the household level. Thus, if future strategies to cope with the disease should succeed, women must be involved in the planning, implementation, and monitoring of AIDS control programmes.

The prevalence of HIV/AIDS in the Accra Metropolitan area and indeed the rest of Ghana is very much a family matter. This is because traditionally, the nuclear and extended families provide the main support for members of the family. The responsibility for the extra care and support for a member who becomes a victim of AIDS therefore lies on the entire family. Reaction to the disease, however, has tended to weaken relationships, especially with non-relatives (Anarfi, 1992). With no cure for nor vaccine to prevent AIDS at the moment, infected people should not be neglected by health services, rejected by their families and friends.

nor abandoned by society. Fear and ignorance could have the most profound consequences with regard to discrimination and human rights infringements against high risk groups as is, for example, manifesting in international travel restrictions (Mann, 1987).

The social emphasis in this study does not mean that it disputes the need for biological, medical and health breakthroughs to control AIDS. On the contrary, the appeal is for the maximum development and application of what bio-medical research and public health measures can offer within the context of social and behavioural change. In this connection, Wood (1988) argued that geographers applying their knowledge of spatial diffusion, population mobility and regional characteristics can describe spatial aspects of human sexual behaviour and activity and help provide appropriate interventions to fight what Mann (1987) described as "the epidemic of fear and ignorance" In the area of AIDS research, geographers have much to contribute since existing work has largely "ignored the spatial dimensions of human existence" (Gould, 1991).

## 1.4 CONCEPTUAL FRAMEWORK

### 1.4.1 A review of conceptual framework

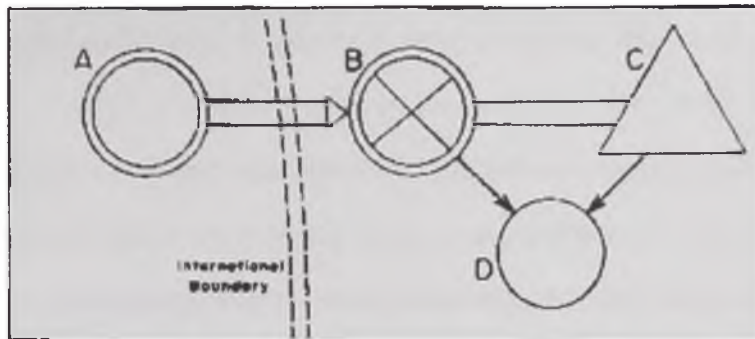
Hagerstrand (1952) pioneered a generalizing and abstracting model that has proved robust in contexts far removed from the original studies of innovation diffusion in farming populations across Southern Sweden. A spatial view of the phenomenon suggested may be categorized into primary, diffusion, condensing and saturation stages. The primary stage has a centre of adoption from which the innovation is diffused outward. Areas close to the centre rapidly acquire

comparatively high rates of adoption while peripheral areas have a lower rate of adoption. The diffusion stage has a strong centrifugal effect with rapid adoption at distant points and a reduction in the strong contrasts of the primary stage. In the condensing stage, there are relative rates of adoption equal in all locations regardless of distance from the centre stage, and for the saturation stage, there is slowing down and eventual cessation of adoption with uniform total adoption rates with minimal regional contrasts. Hagerstrand's innovation diffusion in agriculture shares some common underlying principles with spatial diffusion of diseases as demonstrated by Cliff, Haggett, Ord and Versey (1981). Cliff *et al* (1981) provide an account ranging between Hagerstrand's contribution and theory and practical experience concerning epidemics and their spatial diffusion from biostatistics using a set of long-run data on measles in Iceland.

#### 1.4.2 An elaboration of conceptual framework adopted for the study

The conceptual model for this study draws on Wood's (1988) North-South hybrid spatial diffusion pattern, which derives from the logic of Hagerstrand's work. The AIDS North-South hybrid pattern (Fig. 1) is postulated as a paradigm of diffusion for developing countries, where HIV transmission is mostly a hetero-sexual affair with cross border movements by prostitutes, traders, refugees and peace-keeping soldiers facilitated by extensive transportation and marketing linkages which increase the chances of infection. It also recognizes situations where young adults regularly migrate between urban and rural areas. The paradigm will be used to explain the migration history of AIDS infected persons in the city.

Figure 1 AIDS North-South Hybrid Diffusion Pattern



- A Primate cities abroad with groups at high-risk of AIDS infection
  - B Accra divided into residential sectors and with strong international linkages
  - C other urban areas of Ghana with good transportation links with Accra
  - D Villages with migrants commuting to Accra and other towns
- › AIDS-diffusion direction with great impact along route
  - › Diffusion direction with minimum impact along route

*(Source: Adapted from Wood, 1988)*

The growing spread of AIDS is a complex network of high-risk heterosexual activity between geographically mobile drivers, migrant workers, girl friends, and prostitutes involving the HIV pathogen. An understanding of the patterns of distribution of any disease makes imperative an understanding and interpretation of the ecological factors prevalent in the diseased environment which, in the case of AIDS, include the HIV and several high risk sexual situations underlain by factors such as urban residence.

With the formal development of human ecology came the application of the ecological approach in several specialized areas. Of relevance in this thesis is the behavioural ecological approach which concerns the study of social interactions as they affect population dynamics and the study of spatial distribution of interrelated social variables. The behavioural ecological approach will be used to explain the changing spatial relations of persons with AIDS in the AMA. The assumption is that the observed patterns of spatial relations within the AIDS community are the result of the interplay of different ecological factors, some of which have general significance throughout the metropolitan area while others have limited reference, applying merely to specific locations where AIDS may be more prevalent.

Mckenzie (1961) classified these ecological factors generally into four namely: geographical, economic, technical and cultural, and political-administration. The geographical includes climate, topography and resource conditions. The economic comprises a wide range of phenomena such as occupational distribution and levels of living of the populations. The cultural and technical cover the arts, moral attitudes and taboos which influence the distribution of population and services, and the political-administrative include measures such as tariff, taxation, immigration laws and rules governing local utilities.

Whereas the geographical and political-administrative factors can be said to be general for the Accra metropolis, the economic and cultural factors show distinctive variation. Prevailing ecological factors may either enhance or stifle human development. The use of the ecological approach should help in

measuring the influence of the variation in the economic and cultural factors determining or limiting sexual behaviour, and, the prevalence of AIDS in the different residential areas of the Accra metropolis.

It is within this ecological framework that this investigation is set. The approach is selected because it will help measure not only the conditions of spread or equilibrium of AIDS in the study area, but also the conditions for specific segments of the city and for the co-factors

## 1.5 OBJECTIVES AND RATIONALE

The prevalence of HIV in the Accra metropolis is a growing one (NACP, 1996) with an overriding need for control. The purpose of this study is to assess the spatial variation in the prevalence of HIV among residential areas of the city and map out observed patterns of distribution.

The research focuses on differentials in the intensity of the epidemic and highlights the co-factors that promote these differentials. It examines whether the observed differentials reflect only the diffusion of the disease or whether they provide evidence of the likelihood of different equilibrium levels of infection for the different residential zones. It also assesses whether the least affected areas of the city have very different characteristics from the widely affected areas.

More specifically, the study intends to achieve the following:

- 1 to map out observed spatial patterns of variation in the prevalence of AIDS in Accra,
- 2 to examine factors underlying spatial variation in prevalence of AIDS in Accra;

- 3 identify cells of high and low risk sexual activities such as prostitution within residential areas of the city; and
- 4 to find out the perceptions of the people of Accra on AIDS in relation to high-risk sexual activity and place of residence as a related co-factor.

Accra has been selected for this study because AIDS in Ghana was first cognized and reported in Accra. Furthermore, much of the data will be collected from the Korle-Bu Teaching Hospital which is located in Accra and has National AIDS Counseling Centre, where patients from the city and indeed all parts of the country report for care and counseling. Lastly, the lack of any study on the spatial dimensions of AIDS in Accra should make this study useful.

## 6 HYPOTHESES

The Accra Planning and Development Programme (APDP) has provided a classification of residential areas of Accra based on socio-economic and environmental characteristics (see Table 3). Based on this classification, Stephens (1994) has reported that data on mortality due to infectious diseases suggest a high degree of correlation between residence in the 3 most deprived areas of the city. She further suggested an increasing risk of mortality for all age groups. Konotey-Ahulu (1989) also found a high degree of correlation between residence in deprived residential areas of Accra and high-risk sexual activity and prostitution. Indeed, in 1993, the US Bureau of the Census published that HIV infection level among young female prostitutes in deprived areas of Accra increased from 25.2 per cent in 1987 to 37.5 per cent in 1991. The very existence of prostitution depends on the cultural construction of gender roles for dominance and submission especially within the deprived residential communities. The sexual and economic inequality within specific residential

areas will therefore determine the nature of sexual networking and the likelihood of HIV infection. The social and economic situation within each residential area in Accra will thus have a profound impact on women's sexuality. The poor and disadvantaged young females will most likely service the sexual needs of relatively better off older males for payment either in cash or in kind. The high-risk sexual activity in the most deprived residential areas compared to that of less deprived areas is considered to be the most important co-factor in the transmission of HIV and AIDS in Accra. Specific hypotheses to be tested are that:

- 1 There is a relationship between residence in socially, economically, and environmentally more deprived areas and the prevalence of AIDS in the Accra metropolis.
- 2 There is a relationship between gender and AIDS frequencies observed in the different residential zones of Accra.
- 3 A relationship exists between the stated occupation of AIDS patients residing in different localities and the prevalence of AIDS in the Accra metropolis
- 4 Past travel abroad has a relationship with HIV infection among AIDS patients in the Accra metropolis

## 1.7 CHAPTER ORGANISATION

The study is divided into seven chapters. Chapter 1 introduces the subject matter, states the problem, and reviews relevant literature. It also provides the theoretical framework, objectives and rationale, and the hypotheses guiding the study. Chapter 2 defines the Accra Metropolis as the study area and presents the methodology used and the limitations met with in the study. Chapter 3 gives a summary of the epidemiology of AIDS in Accra as a basis for investigating the

emerging threat of AIDS. In Chapter 4, observed spatial patterns of AIDS in Accra are described and in Chapter 5, the major factors underlying the observed patterns are considered. Chapters 6 and 7 look into some common perceptions and attitudes to AIDS and peep into the future of the epidemic.

## CHAPTER TWO

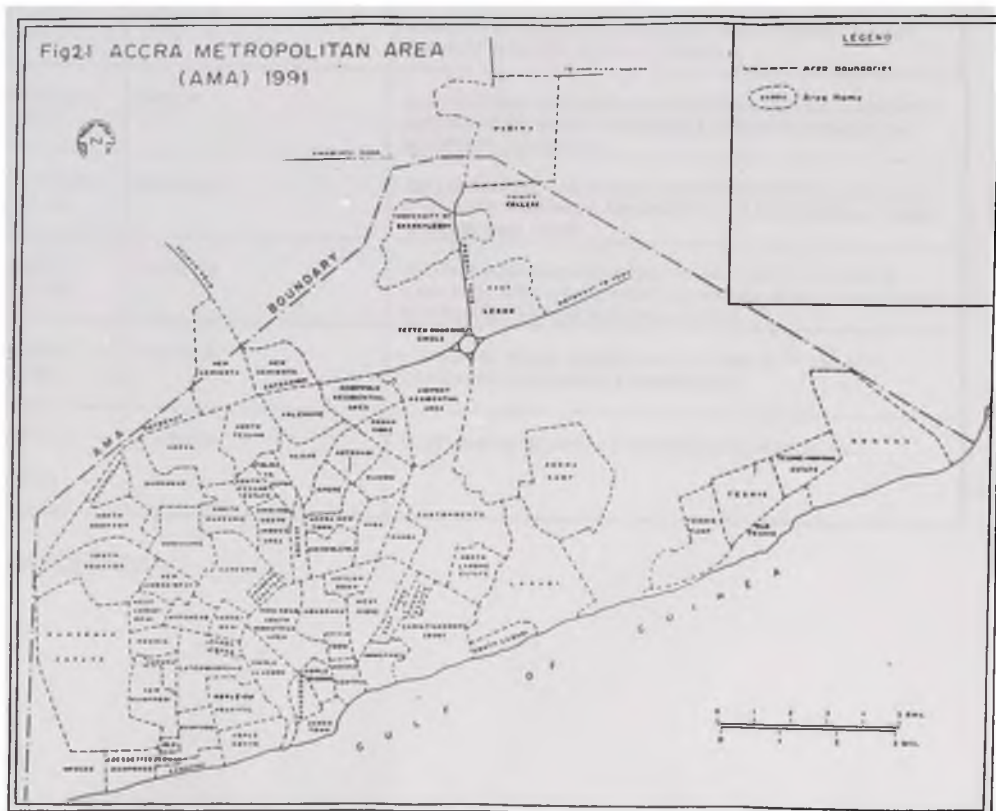
### RESEARCH DESIGN AND METHODOLOGY

#### 2.1 THE STUDY AREA

Demographically the Accra metropolis is the largest of Ghana's existing 10 leading urban centres. It had an estimated population of 1.2 million in 1991, contains about 70 percent of the total population of the Greater Accra Region, and accounts for some 30 percent of the urban population of Ghana and 10 percent of the total population of Ghana (MLG 1992).

Geographically, Accra is bounded on the north by latitude  $5^{\circ} 41.5^1$  N, on the south by the Gulf of Guinea, on the east by Longitude  $00^{\circ} 01^1$  E and on the West by Longitude  $00^{\circ} 21.5$  (See Fig.2.1).

**Fig 2.1 THE ACCRA METROPOLITAN AREA (AMA) 1991**



Seven residential sectors have been defined for Accra in a Housing Needs Assessment study prepared by the United Nations Centre for Human Settlements (UNCHS) and the Accra Planning and Development Programme (APDP) in 1990. The stratification of Accra into residential sectors is founded on a complex of prevailing social and economic factors. The attraction this stratification has is that it is derived from a comprehensive empirical survey of social and economic characteristics of households in combination with physical and housing characteristics such as physical tests of water quality and exposure to air pollution. The seven residential sectors are shown in Table 3 below:

**Table 3 Seven Residential Sectors of Accra Classified by Social and Economic Similarities**

HIGH DENSITY INDIGENOUS SECTOR	H.D.I.S	OSU, KORLE DUDOR, NUNGUA, OLD TESHIE, I.A, JAMES TOWN, CHORKOR, ADEDENKPO, OLD DANSOMAN, KORLE KONNO
HIGH DENSITY LOW CLASS SECTOR	H.D.L.C.S	NIMA, NEW TOWN, SUKURA/RUSSIA, TUDU, SABON ZONGO, MAMOBI, MADINA, ACCRA CENTRAL.
MEDIUM DENSITY INDIGENOUS SECTOR	M.D.I.S	ABOSSEY-OKAI, MALAIHEKO, DARKUMAN, ABEKA, MAMPROBI, KOKOMLEMLE, KPEHE, ADAABRAKA, NORTH ODORKOR, NEW MAMPROBI, BUBIASHE
MEDIUM DENSITY MIDDLE CLASS SECTOR	M.D.M.C.S	ASYLUM DOWN, AVENOR, ALAJO, TESHIE-NUNGUA ESTATES, KOTOBABI, ABLENKPE, DZORWULU, LATEBIKOSHIE, TESHIE CAMP, BURMA CAMP
LOW DENSITY MIDDLE CLASS SECTOR	L.D.M.C.S	TESHIE, DANSOMAN ESTATES, TESANO SOUTH ODORKOR, KANESHIE, MINISTRIES, NEW DANSOMAN, NORTH INDUSTRIAL, NORTH KANESHIE, SOUTH INDUSTRIAL.
LOW DENSITY HIGH CLASS SECTOR	L.D.H.C.S	EAST/WEST RIDGE, NORTH LABONE, RINGWAY ESTATES, CANTONMENTS, AIRPORT RESIDENTIAL.
LOW DENSITY NEWLY DEVELOPING SECTOR	L.D.N.D.S	EAST LEGON, SHASHI, LEGON VILLAGE, ACHIMOTA

Source APDP 1990

Table 4 The Proportion of Population Residing in the Seven Residential Sectors

SECTOR	% SHARE OF POPULATION OF ACCRA
H.D.I.S	26.0
H.D.L.C.S	20.0
M.D.I.S	21.0
M.D.M.C.S	12.0
L.D.M.C.S	15.0
L.D.H.C.S	4.0
L.D.N.D.S	2.0

Source: Extracted from 1984 Republic of Ghana Census Reports

## 2.2 RESEARCH INSTRUMENTS

An interview schedule for AIDS patients and an open-ended questionnaire survey for the general public were used to collect data on age, sex, nuptiality and child bearing, level of education, sexual behaviour, place of residence, history of travel and attitudinal data on knowledge and opinion about AIDS. Interviews were used for AIDS patients in order to conduct in-depth investigation on a face to face basis. The approach helped to capture only relevant responses and the possibility of follow-up questions based on responses received. For the general public, limitations on time determined the use of the questionnaire.

## 2.3 SAMPLING FRAME

Accra constituted the population universe and the sampling units included the seven residential sectors and the AIDS Counseling Centre of the Korle-Bu Teaching Hospital. Preliminary contact with officials of the AIDS Counseling Centre revealed that on the average 10 people reported for counseling and treatment on their weekly Wednesday clinics. The first part of the fieldwork involved interviewing of persons attending clinic on four consecutive Wednesday to cover a period of four weeks. A total of 40 patients were interviewed. An adjustment for two extra Wednesdays was planned against the possibility of not meeting any new cases in the programmed four weeks to ensure that an optimum of 40 respondents was obtained. This was supplemented with unstructured interviewing of AIDS-related health workers and relations of patients who were available at the Centre during the period of the fieldwork.

The second part of the fieldwork adopted the residential stratification defined for Accra (see Table 3). Within each stratum, one neighbourhood was selected in a simple random fashion to yield a total of seven neighbourhoods. The restriction to only one neighbourhood in each stratum was due to lack of resources to examine more areas. A total of 100 questionnaires were apportioned across the selected seven neighbourhoods according to the proportion of population resident within the stratum in which the neighbourhood was located.

The distribution was as follows:

H.D.I.S	26	respondents
H.D.L.C.S	20	"
M.D.I.S	21	"
M.D.M.C.S	12	"
L.D.M.C.S	15	"
L.D.H.C.S	4.0	"
L.D.N.D.S	2.0	"

Whereas it was quite straight forward in the case of patients since all those who reported at the AIDS centre at Korle-bu were interviewed, it was not so simple in the case of the general public. A purely simple random selection of respondents for the general public was not possible because a sampling frame did not exist to facilitate such a selection. An attempt to compile a list of all high risk sexual activists operating around hotels, cinemas, night clubs, markets, lorry parks and barracks was considered not only expensive and time-consuming but also beyond the scope of this study. Respondents were therefore not pre-selected but selected by chance at the time of interview and according to proportions allocated to the various residential localities. The timing of this part of the study was programmed to coincide with the same period as the first part.

#### 2.4 DATA ANALYSIS

The statistical software SPSS/PCT was used for analyzing responses obtained from both AIDS patients and the general public. Cartographic methods were also employed to map out observed patterns of AIDS prevalence in the metropolis

## 2.5 LIMITATIONS AND CONSTRAINTS

In Accra, people seek medical attention from sources other than hospitals. It is possible that there are people with AIDS who may not be reporting to the AIDS Centre at Korle-Bu. Such people are not covered by the scope of the data. Using hospital attendance as criterion of estimating and making generalized statements on some aspects of AIDS prevalence in the metropolis, therefore may give wrong indications which may lead to wrong conclusions. In spite of such a deficiency, it is considered useful to make use of what is available at this stage to approximately determine the spatial characteristics of AIDS in Accra.

During the preliminary survey, it was clear that the target population for both AIDS patients and the general public would include illiterates. Some of the interviews, therefore, had to be conducted in local languages. Therefore, some assistance had to be arranged at some cost. The possibility of some bias on the part of the hired language assistants in the translation and interpretation of responses cannot be overruled. The problems of illiteracy in some of the respondents may also have affected the understanding of some questions, particularly those relating to attitudes and perception, and ultimately affected the accuracy of data obtained.

On the quality of responses, it is generally accepted that males tend to exaggerate their level of sexual activity while females tend to underestimate theirs (Awusabo-Asare, 1992). It is thus difficult establishing credibility of responses relating to sexuality especially where there is no means of verifying such responses. The issue of AIDS is quite a sensitive one especially because it

borders on human sexual behaviour, information about which people may neither disclose correctly nor readily. Moreover, the stigma associated with AIDS makes obtaining information about the subject from patients quite difficult. In some instances, respondents broke down and wept. The possibility of emotions influencing their responses and thus affecting the accuracy of the data cannot therefore be overlooked. However, in all instances, the consent of the patient was sought before the interview was conducted. It is recognized that education and motivation to sensitize patients, their relations and the general public on the need to change their attitude and to be open about the disease will promote researching into the various dimensions of the disease.

Hopefully the existence of place-relevant variables in mapping out AIDS in the Accra metropolitan area may reduce distortions that may arise out of ignoring several unreported and unknown cases.

## CHAPTER 3

## EPIDEMIOLOGY OF AIDS IN ACCRA

## 3.1 DEFINITION OF AIDS

The definition of AIDS differs from continent to continent. In Europe and North America, AIDS-defined disease include some 29 unrelated maladies ranging from pneumonia and pulmonary tuberculosis to cervical cancer. In addition, an HIV positive test and a T-Cell count below 200 are necessary for a confirmed diagnosis.

In Africa, the term 'AIDS' is used to describe symptoms associated with a number of previously known diseases. The WHO's clinical-case definition of AIDS adopted for Africa in 1995 is not based on an HIV test or T-cell count but on the combined symptoms of chronic diarrhoea, prolonged fever, 10 percent body weight loss in about two months and a persistent cough, none of which are uncommon on the African continent. These common diseases were in the mid-1980s re-classified as "special opportunistic AIDS-related infections" and Africans were warned to change their sexual practices through abstinence, monogamy and condom use or they would die (Konotey-Ahulu, 1989).

A 1994 study published in the Journal of Infectious Diseases concluded that HIV tests were useless in Central Africa, where the microbes responsible for tuberculosis, malaria and leprosy were so prevalent that they registered over

70 percent false positive results. Consequently, Standing (1992), a British Medical Anthropologist and AIDS researcher, has conceded that African 'risk populations are assumed rather than revealed.' Angwafo (1994) also holds the view that in Africa poverty, not some extraordinary sexual behaviour, is the best predictor of AIDS-defining diseases. According to him, the purported link between HIV and AIDS was first hypothesized about 10 years ago but it has subsequently acquired a life of its own, especially among fund-raisers and sex educators, who, like the theory, remain immune to criticism. Of course people everywhere should be encouraged to behave more responsibly in their sexual lives. They should be provided with reliable counseling about condom use, contraception, family planning and sexually transmitted diseases (STD). Whether in Zaire or California, sex education must no longer be distorted by terrifying misinformation that equates sex with death. Angwafo thus invites his so-called AIDS-skeptics to scrutinize ethnocentric stereotypes about African sexuality and thoroughly re-appraise the entire HIV = AIDS orthodoxy.

### 3.2 HIV INFECTION AND AIDS

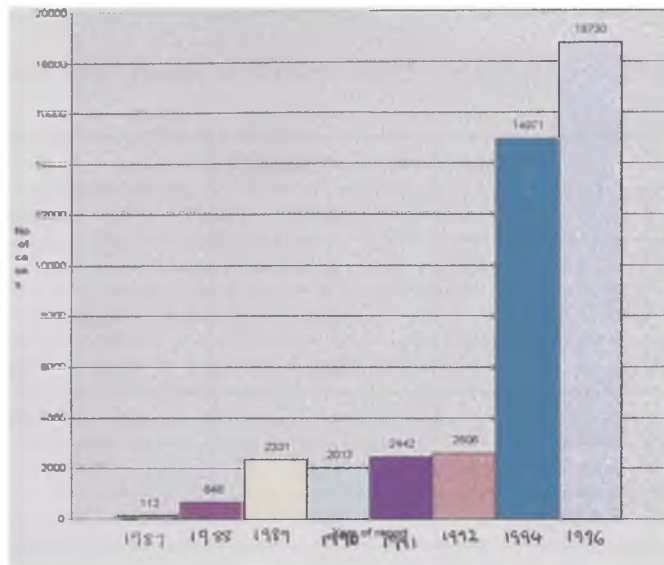
It is important to distinguish between the epidemiology of HIV and AIDS. AIDS statistics are usually obtained from morbidity and mortality records. Estimates of the prevalence and incidence of HIV infection, however, are based either on findings from cohort studies or from the notification of voluntary HIV antibody tests which cannot be taken as representative or exhaustive. For this reason HIV figures are likely to be less reliable than that of actual AIDS. Nevertheless, epidemiological research evidence from cohort

studies seems to suggest that we should regard progression to clinical AIDS after infection with HIV as the norm rather than the exception (Moss, 1988).

In Accra, the first known cases of AIDS were a man and a woman who had already been diagnosed in Europe and were returning home, as it were to die, in 1986. Medical doctors then began to notice more cases that fitted the WHO's criteria of person with AIDS such as weight loss combined with chronic diarrhoea or cough, wounds not healing, skin rashes and general diseases. In retrospect, some medical doctors now believe that they were seeing people with AIDS in Ghana as far back as 1981.

In Ghana as a whole, from a reported number of 42 actual cases of AIDS in 1986 there was an increase to 112 in 1987. This further increased to 646 cases in 1988, and by 1989, there had been a sharp increase to 2331 cases as shown in Fig. 3.1 below. As at 1992, the number of cumulative AIDS cases reported by the Ministry of Health stood at 2606. The figure increased sharply to 14,917 by December 1994. Estimates as at June 1996 reported 18,730 cases (see Fig. 3 below).

Figure 3 Reported cumulative AIDS cases in Ghana by year of report 1987-1996



Source: MOH, Accra (September 1996)

There is much more to the epidemic than the number of reported cases. The reported cases represent only the visible part of the epidemic. It is estimated that the officially reported cases reflect less than 50 per cent of all cases of AIDS which have occurred in the country and that more than 40,000 cases may have actually occurred (MOH, 1996). Besides, AIDS cases are only the tip of a pyramid. Many more people are infected with HIV, which is neither known nor recognised. It is estimated that as at December 1994, a cumulative total of about 400,000 Ghanaians had been infected with HIV. Most of these people would not know they were infected. They would have no symptoms at all, however, all of them are capable of passing on the AIDS virus to others.

In the Greater Accra region, the Accra metropolis had the highest share of 48 percent of reported HIV seropositive cases from March 1986 to August 1993

Table 5 Reported HIV+ Cases in Greater Accra Region by District as at August 1993

DISTRICT	FEMALE	MALE	TOTAL
Accra Metropolis	513	392	905
Tema	75	57	132
Ga Rural	21	10	31
Dangbe East	42	30	72
Dangbe West	7	5	12
Not stated	476	270	746
TOTAL	1134	765	1899

Source: MOH, Feb. 1994.

There is the possibility that some people may have died or may be dying from HIV-related conditions but may not have been diagnosed as such. Such cases are not reflected in Table 3.1 above. More accurate reporting can be expected as knowledge about HIV and AIDS increases among doctors and the general public.

### 3.3 RISK FACTORS

Before HIV was isolated, epidemiologists had identified a number of risk factors for AIDS. Some were of a general nature, such as being gay or an injecting drug user. Others were more specified, related to particular behaviours such as multiple sexual partnerships, and receptive anal sex. Consequently, gay and bisexual men, injecting drug users, and prostitutes

were presented as high-risk groups. Haemophiliacs and recipients of blood transfusion later joined them. The nature of risk factors however may change over time in response to health education and increased awareness. Thus, the adoption of safer drug-related practices may have altered the extent to which injecting drug use is still a risk factor. For those who inject but never share equipment, injection is no longer a risk factor, whereas for those who share syringes and needles, it still is.

It is important to distinguish possible risk factors from actual mechanisms of transmission when considering sexual behaviour as a mode of transmission. In the early days of the epidemic, when practically very little was understood, sexual partnerships were important for predicting those who were likely to acquire AIDS. Subsequent knowledge about HIV's modes of transmission has however shown that if safer sex guidelines are strictly followed with every sexual partner with no exchange of semen, blood, vaginal or cervical fluid there is no risk. Thus, having several partners will not in itself increase the risk of transmission except there is exchange of body fluids.

Heterosexual transmission of AIDS from one person to another is of a low probability for every sexual act that epidemics are unlikely to occur unless there are co-factors which raise the probability, such as sections of the population serving as a reservoir for the disease (Caldwell and Caldwell, 1993). In the case of AIDS in Accra, such a reservoir has been identified to include prostitutes, loiterers, petty traders, truck drivers and returnee soldiers from peace-keeping duties. Such people are also likely to be found in

neighbourhoods with concentration of facilities such as hotels, cinemas, nightclubs, night markets, barracks, and lorry parks. There are sectors of Accra such as Osu, La, Korle Gonno, Adabraka, Kotobabi, Burma Camp and Kaneshie, which have cinema halls, night markets, lorry parks, police, and military barracks - some of the risky areas.

### 3.4 TRANSMISSION DYNAMICS

Much of the present understanding about HIV transmission comes from epidemiological studies looking at the groups most affected by HIV infection, sexual contact studies and studies of households, hospitals and workplaces. Four modes of transmission namely: sexual transmission, transmission via blood and blood products, transmission via body organ transplant and transmission from mother to child before and at birth are generally agreed. Epidemiological studies indicate that transmission of HIV in Accra is primarily by heterosexual intercourse as indicated by the almost 1:1 sex ratio of HIV infections. Between 80 and 90 percent of those infected are in the most sexually active age group of 20-40 years old and have had multiple sexual partners (Ansary et al, 1989; Konotey-Ahulu, 1989). The process of HIV and AIDS diffusion in the metropolis was initially hierarchical with areas in Accra becoming infected by seropositive persons coming from epicentres in primate cities abroad particularly Abidjan, Cote d'Ivoire. Ghanaian young female prostitutes returning from Cote d'Ivoire represented less than 5 per cent of all HIV tests but accounted for almost 75 per cent of infections (Smallman-Raynor et al., 1992). Of all the countries on the coast of West Africa, Cote d'Ivoire makes no secret of the fact that it caters comprehensively for

international prostitution. With the common knowledge of the role of neighbouring Cote d'Ivoire in international sex trade, it was not surprising for Konotey-Ahulu (1987f) to report that all except two of the AIDS patients in Accra in 1987 were prostitutes who had worked in Abidjan.

Although early cases of AIDS in Accra were strongly associated with female prostitutes with a history of international travel, most of the reported cases in the 1990s do not reflect this factor. After an initial importation of HIV from abroad, the epidemic in Accra has become self-perpetuating because of favourable local factors. Many young people travel frequently between their towns, villages, and Accra in search of employment and better lifestyles. In many instances, their sexual contacts multiply. These are likely to acquire the HIV and carry it back home to infect their partners. After its introduction, the subsequent dynamics of HIV and AIDS transmission has assumed a contagious pattern of diffusion infecting from areas where the conditions for transmission such as high -risk sexual activity are optimal. Thus, although HIV was initially introduced from abroad, its growing prevalence and spread are probable evidence that local social and cultural conditions in particular residential localities in the metropolis favour the easy spread of the epidemic. Indeed, this study reveals that AIDS patients interviewed from the Low Density High Class sector have neither travelled outside the country or even the metropolis.

Two factors are important in the transmission of AIDS in Accra, which may be summed up as "money to spend, and women to spend it on" Commercial sex

in the city is poverty driven and is a matter of survival. Frequent sexual activity often leads to traumatization of the perineum and produce ulcers. Treatment for such ulcers is scanty and all kinds of fake drugs are sold as antibiotics to unsuspecting victims for treatment. Such venereal ulcers and warts may easily allow HIV to invade the body (Konotey-Ahulu, 1989). Widespread non-use of condoms is also a significant contributor to the increasing prevalence of AIDS. Often, pimps and brothel queens prevent prostitutes from using condoms to suit client demands in spite of the risks. However in some instances, prostitutes indulge in unprotective sex for more money. It is also important to note that very few prostitutes are independent. Lots of them are forced into prostitution and are made to work for very long hours. Some of them are very young girls who are lured from villages and small towns into the city upon a promise of "better life". This situation may be contrasted with the circumstances of a European female prostitute whose involvement in prostitution may not be so much a question of survival since the state provides some amount of welfare, however meagre. The European female prostitute may also not be totally dependent on pimps or brothel queens and may have easy access to genuine treatment facilities, and may be sufficiently exposed as to indulge in protective or unprotective sex as a matter of choice.

## CHAPTER 4

### SPATIAL PATTERNS AND MAPPING

#### 4.1 MAPPING

In considering area patterns of disease, information about the size of the population at risk in the areas concerned may be very useful. Sutherland (1962) drew attention to the principal deficiency of the geographical base-map in this respect. With reference to Scotland, he demonstrated that on the normal map correct weighting could not be given to the large urban populations which occupy small areas, whilst small populations sparsely distributed over large areas, could appear to be over-represented. Nonetheless, base-maps could relate disease rates to the local populations at risk as well as to geographical position and might prove to be a useful epidemiological tool.

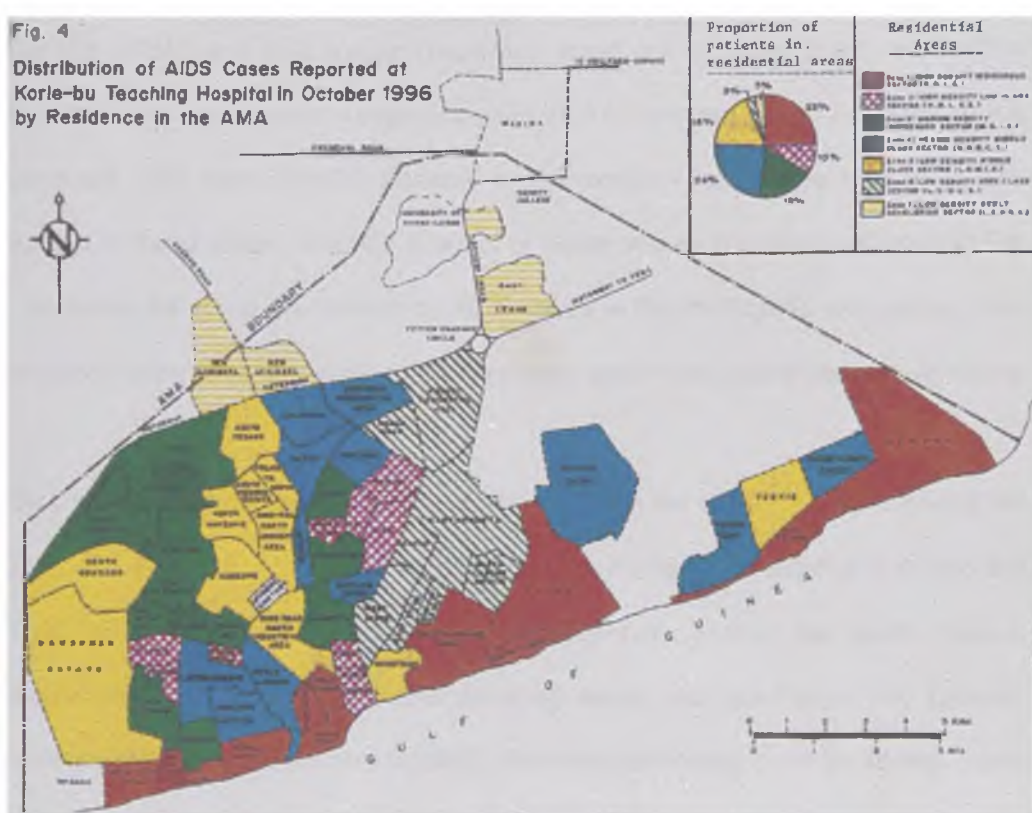
The base-map, upon which the AIDS prevalence is plotted in Fig 4 below, is the administrative map of the Accra Metropolitan Area. The seven major sectors formulated because of common characteristics such as population, income levels, and households are all represented. Contiguity of geographical boundaries and relative geographical positions of the sectors are as far as possible maintained.

#### 4.2 OBSERVED PATTERNS

Officially diagnosed AIDS patients attending clinical or counselling sessions at the Fevers Unit of the Korle-Bu Teaching Hospital over the survey period were

interviewed. Their distribution pattern according to their place of residence in the metropolis is shown in Fig 4 below.

Figure 4 Reported AIDS cases at Korle-bu Teaching Hospital in October 1996 by residence in Accra



Of the total number of AIDS patients residing in the Accra metropolis, 25 percent are in the MDMC area. This area covers the north central and parts of the eastern patches of the metropolis. A small area in the Western section of the metropolis is included in this area. The MDMC area is coloured blue in Fig 4.

The next area of concentration of resident AIDS patients is the HDI coloured orange in Fig 4 and stretching from the east to the west along the coastal frontier. This area accounts for about 22.5 percent of recorded AIDS residents in the metropolis.

Except for small breaks of land and lagoon at South Labadi, Ministries and sections of Accra-Central and Teshie-Labadi, this occupies a continuous stretch of coastal area

The MDI and LDMC areas rank next in the concentration of AIDS patients in Accra after the MDMC and HDI areas. These two areas are coloured green and yellow respectively in Fig 4. Each of them accounts for 17.5 percent of AIDS patients in the metropolis. The bulk of AIDS patients in the western half of the metropolis are resident in these areas. The HDLC areas of Accra shown in a shade of violet in Fig 4, accounts for some 10 percent of AIDS cases in the metropolis and occupy tiny patches of area along the coast, in the mid-west and in the central sections of Accra

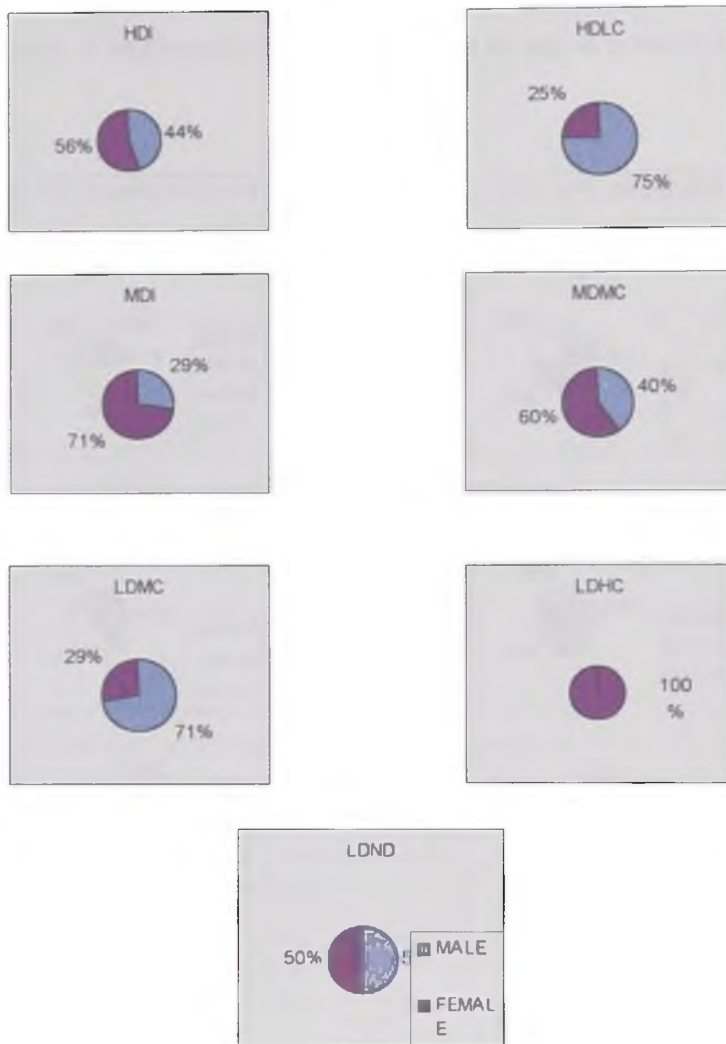
The areas of least concentration of AIDS patients are the LDND (5 per cent) and the LDHC (2.5 percent). The LDND area is shown in a shade of yellow (Fig 4) and the LDHC area is shown in a shade of green stretching from the North Central Southwards towards the coast and covering areas such as Ridge and Labone. Evidently HDI, MDI, MDMC and LDMC which include areas such as James Town, Bubiashie, Abelenkpe and Dansoman stand in contrast to LDHC and LDND which include areas such as Cantonments and Legon village. The HDLC areas which includes New Town, Accra Central and Medina represent a median.

#### 4.3 GENDER AND AGE CHARACTERISTICS

The distribution of AIDS patients residing in Accra by gender is shown in Fig 5 below

Figure 5 Reported AIDS cases at Korle-bu Teaching Hospital in October 1996: gender by residence in Accra

Fig. 5 Reported AIDS cases in Korle-bu Teaching Hospital in Oct. 1996 gender by residence in Accra.



As can be seen from Fig 5 there are more females than males in the HDI, MDI, and MDMC areas. Indeed the only patient identified in the LDHC area is female and there are as many females as males in the LDND areas. It is only in the HDLC and LDMC areas that males outstrip the number of females. Fifty-three per

cent of the entire study sample are female. The higher number of females confirms a female preponderance in the prevalence of AIDS for the Accra metropolis.

The distribution of AIDS patients residing in Accra by age is presented in Fig 6 below.

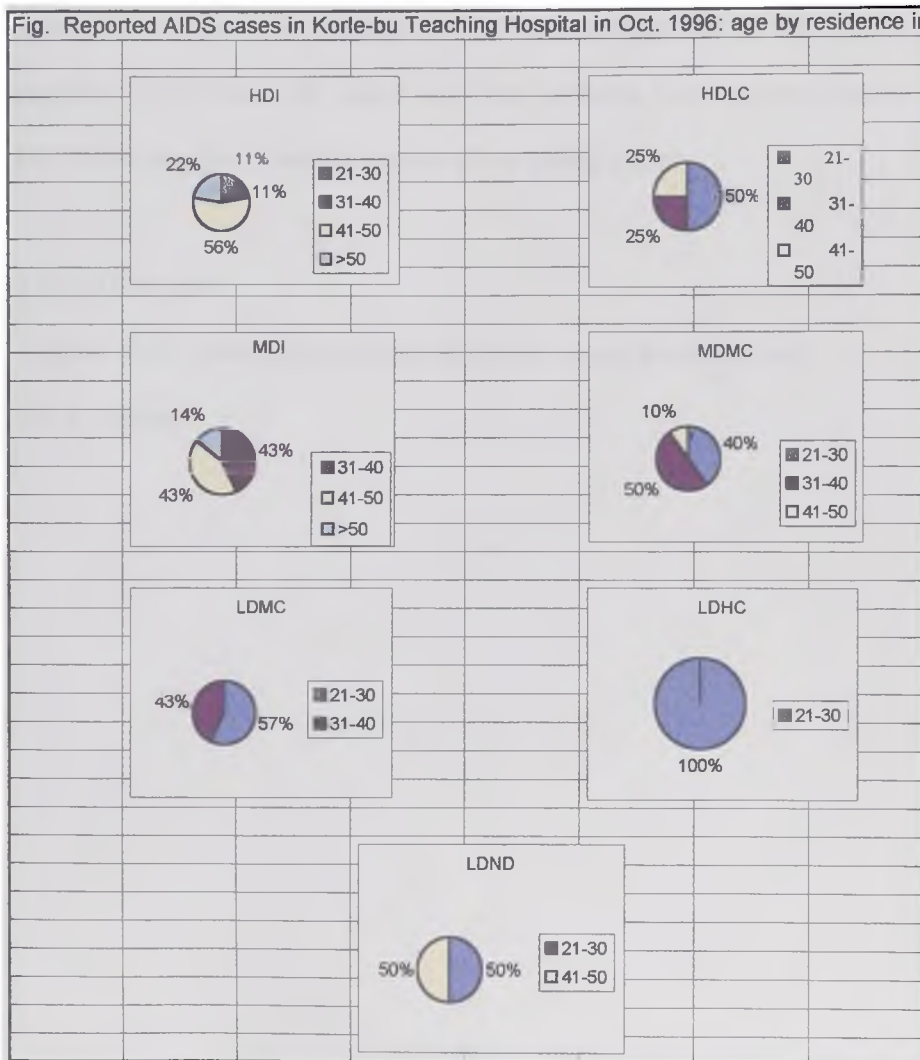


Figure 6 Reported AIDS cases at Korle-bu Teaching Hospital in October 1996 age by residence in Accra

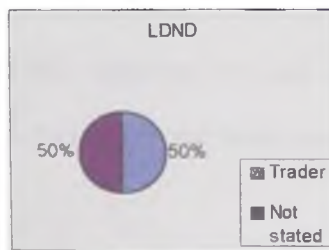
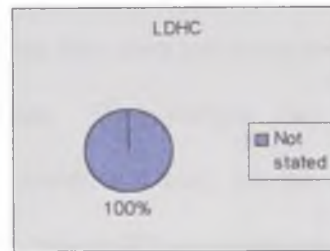
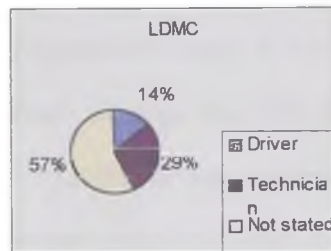
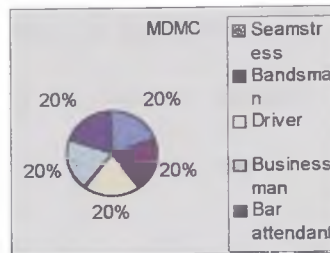
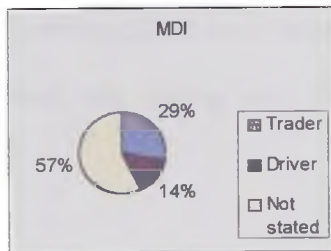
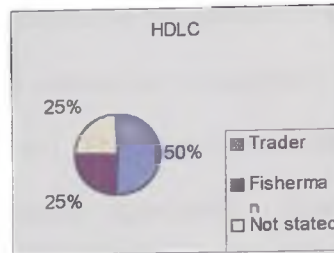
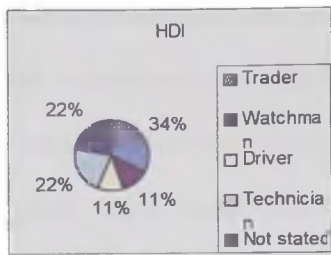
It can be seen from Fig 6 that the HDI area is the only area with a relatively non-youthful scenario in AIDS prevalence. Seventy-eight per cent of patients residing in this area is more than 40 years old. This is a deviation from the overall picture in the metropolis, which shows that 65 per cent of cases among residents were diagnosed among patients aged between 21 and 40 years old. For the metropolis as a whole, only 28 percent of cases were reported in patients aged between 41 and 50 years old and 7.0 percent were reportedly aged above 50 years old. This confirms that reported cases of AIDS in the metropolis predominantly affect young people.

#### 4.4 OCCUPATION

The types of occupation declared by patients surveyed are presented in Fig 7 overleaf.

Figure 7 Reported AIDS cases at Korle-bu Teaching Hospital in October 1996 occupation by residence in Accra

Fig 7 Reported AIDS cases in Korle-bu Teaching Hospital in Oct. 1996: occupation by residence



In the HDI areas, 34 per cent were traders, 22 per cent were watchmen and technicians respectively, 11 per cent were drivers, and another 11 per cent did not state their occupations. In the HDLC, 50 per cent were traders, 25 per cent were fishermen, and another 25 per cent did not declare their occupations. Fifty-seven per cent of patients in the MDI areas did not declare any occupations, 29 per cent were traders and 14 per cent were fishermen. For those in the MDMC areas, 25 per cent each were seamstresses, bandsmen, drivers, businesspersons, and bar maids. In the LDMC, 57 per cent stated no occupations, 29 per cent were technicians and 14 per cent were drivers. The only patient from the LDHC area stated no occupation. In the LDND areas, 50 per cent were into trading and the remaining 50 per cent declared no occupations.

Fig 7 reveals that none of the females surveyed declared prostitution as her means of livelihood. Significantly, however, 45.0 per cent did not reveal what their primary occupations were. It is conceivable that they were into commercial sexual activities although they did not so indicate. Their reserve may be attributable to the shame and embarrassment associated with such activities. It may perhaps also confirm the notion that English-speaking African prostitutes do not readily give away their profession when asked and would often say "trader" (Konotey-Ahulu, 1989). Overall, 20.0 per cent said they traded in petty goods, 4.0 per cent were drivers and the remaining 31.0 per cent comprised a bar attendant, fisherman, technician, bandsman, watchman and seamstress

On previous employment, 52.0 percent did not disclose any past occupation, 8.0 per cent had been in petty trading, and 5.0 per cent respectively had been soldiers, dressmakers, teachers, and bank clerks. The rest had been into farming, hairdressing, and dealing in second hand clothing. Up to 1988, virtually all AIDS patients in the country as a whole were females with an occupational history of prostitution (Konotey-Ahulu, 1987; Neequaye *et al.*, 1986).

#### 4.5 HISTORY OF TRAVEL

Within the past 10 years, 42.5 percent had normally resided in Accra. 7.5 per cent had normally resided outside Ghana. Besides, 82.0 per cent had lived permanently in one neighbourhood while 18 per cent had moved residence. The observed pattern of residence and travel is shown in Fig. 8 overleaf.

Fig 8 Reported AIDS cases in Korle-bu Teaching Hospital in Oct. 1996: hist

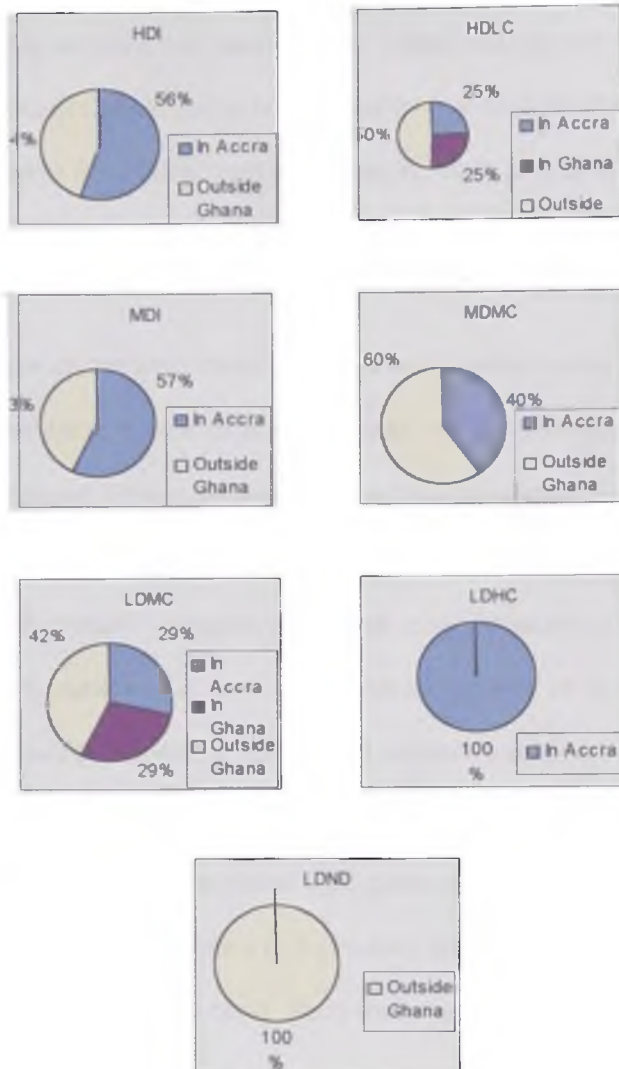


Figure 8 Reported AIDS cases at Korle-bu Teaching Hospital in October 1996 history of travel by residence in Accra

As can be seen in fig 8, within the same 10-year period, 56 per cent of respondents from HDI had lived permanently in Accra and 44.0 per cent had lived permanently outside Ghana. For HDLC, 25.0 per cent had lived only in Accra another 25.0 percent had lived permanently outside Accra but in Ghana

and 50.0 per cent had lived permanently outside Ghana. MDI had 57 per cent in Accra and 43.0 per cent outside Ghana. In MDMC, 40.0 per cent had been in Accra and 60 per cent had been outside. LDMC had 28 per cent in Accra, the same proportion outside Accra but in Ghana, and 44.0 per cent outside Ghana. All respondents from LDHC had only been in Accra and all those in LDND had lived permanently outside Ghana.

The purposes of domestic travel by respondents were trading (10 per cent) and visits (15 per cent). About 75 per cent could neither remember nor provide any reasons for travel. Fifteen per cent admitted having worked during travels. But it is conceivable that most of the respondents who reported having done no work during travels primarily engaged in high-risk commercial sex activities which they felt reticent to disclose because of the shame and lack of sympathy associated with such activities. However, 23 per cent admitted indulging in casual sex.

The reasons for international travel were given as trading (37 per cent), visits (12 per cent), peacekeeping duties (2.5 per cent), escape from persecution (2.5 per cent) and marriage (2.5 per cent). Forty-three per cent provided no reason. Fifty-two per cent indulged in casual sex abroad and 15 per cent had regular partners who had also travelled abroad in the past.

#### 4.6 OTHER PATIENT CHARACTERISTICS

##### 4.6.1 Education

Thirteen per cent had had no education at all, 3.0 per cent did not comment on their educational status and 84.0 per cent had had some form of education

Among the educated, 95.0 per cent had schooled up to the secondary level and 5.0 per cent had had post-secondary training. Seventy-two per cent of patients professed to be Christians, 15.0 per cent claimed to be Muslims, and 13.0 per cent did not disclose their faiths. On ethnic origins, Akans represented 52 per cent, Gas 30 per cent, 5.0 per cent respectively for Ewe and Dagombas while several other ethnic groups shared the remaining 8.0 percent.

#### 4.6.2 STD History

Thirty-seven per cent reported contracting some form of sexually transmitted disease (STD) in the past, 60 per cent reported no such history and 2.5 per cent did not disclose whether they had ever had any STD. While 22 per cent had had STD infection only once, 12 per cent had had it on more than one occasion. Gonorrhoea (27 per cent) and syphilis (10 per cent) were the only reported cases. Fifteen per cent contracted STD from residential neighborhoods other than where they normally resided. Seven and a half per cent knew their partners had contracted STD in the past while 12.5 per cent knew their partners had no STD record. Forty-two per cent could not tell whether their partners had had any STD past and 37.5 per cent did not comment. Indeed the prevalence of HIV infection in males attending sexually transmitted disease clinics in the Accra Metropolis showed more than a quadrupled increase from 2.1 per cent in 1988 to 8.6 per cent in 1991 (US Bureau of Census, June 1993).

## CHAPTER 5

## FACTORS UNDERLYING OBSERVED SPATIAL PATTERNS

## 5.1 SPATIAL DIFFUSION

Scholars have discussed diffusion of innovation as a social phenomenon since antiquity. From the time of Friedrich Ratzel the tradition has been to compare the spatial distribution of phenomena by the aid of maps. Recent interest in the study of diffusion has taken advantage of quantitative data and the possibilities of immediate observation of on-going processes. One approach toward the diffusion process focuses on the characteristics of the acting individual or household and his acceptance of new consumer goods and services or the adoption of new ideas or practices. The spatial diffusion in this approach often gives the impression of wave propagation or the expansion of ripples from a given source. In the tradition of Geography various concepts such as centres of innovation and spread, channels of diffusion, barriers to diffusion and regional differences in receptivity are generated by this approach. The spatial diffusion of AIDS in the Accra metropolis which generally involves the acceptance and practice of high risk sexual behaviour in the form of multiple and unprotective sexual partnerships and the adoption of the commercial sex trade tends to follow this approach.

Inter-personal sexual contacts are of vital importance in the AIDS diffusion process in the metropolis. They serve to put a premium on the identification of locations where high-risk sexual interactions occur. Leisure and entertainment

centres concentrated in high and medium density areas including Osu and Adabraka facilitate inter personal sexual contacts and attract substantially high prevalence than low-density areas such as the Ridges, Airport Residential and East Legon.

The proliferation in mass media communication in the form of sexually explicit films, fashion and other forms of entertainment as well as sexually suggestive and persuasive advertising are some of the veritable methods of creating receptive attitudes to AIDS prone sexual lifestyles. Spatial diffusion of AIDS in Accra is also dependent on the city's growing network of social communication and the sexual networks that develop with it. Social communication in this context is manifest in weekly social meetings of youth associations, funerals, marriages, festivals, market days, conferences, tourist activities and any celebration or event which may provide an opportunity for sexual indulgence. Tarde (1901) described the way in which intellectual salons of his day were able to effect changes in the art, politics and general culture of French society. Speier (1950) also reported that the middle-class coffee-houses of 17th century England were similarly influential. Contemporary equivalents of these institutions in the Accra metropolis such as beach sessions, funeral gatherings, festivals, and communal associations with their permissive environments readily suggest themselves.

## 5.2 SEXUAL NETWORKING

Certain types of spatial conformation in the human geography of the metropolis further facilitate sexual contacts resulting in the diffusion of AIDS. These include market places. By virtue of its position within the hierarchy of urban centres of

Ghana. Accra facilitates the diffusion of all innovations including sexually permissive and AIDS-related ones. Majority of the cases surveyed (65.0 percent) were adults aged between 21 and 40 years old. Sixty percent of them were married, 2 per cent were re-married, 12 percent were single, another 12 percent were divorced, 5 percent were separated, and 5 percent widowed. Four percent made no comments on their marital status.

Among the married, 53 percent had married just once, 22 percent had married twice, 12 percent had married on three occasions, and 13 percent did not say how many times ever they had married. This shows a high degree of multiple sexual partnerships and sexual networking in nearly half of respondents who claimed to be married. Even among the unmarried, 67 per cent claimed to have sexual partners. The successful infection of these sexually active people is sufficient to accomplish the infection of all those who fall within their network or contact field. Indeed 93.0 per cent of both married and unmarried sexually active respondents were aged below 50 years and each one of them have their own sexual network whose members may sooner or later be infected too if not already infected

Given such a complex situations of marriage, separation, divorce and re-marriage, indications are that it should only be a matter of time for husbands, wives, co-wives and all extra sexual partners as well as their children born after infection to become infected too. Thus, it may well be concluded that the dynamics of HIV infection no more depends on whether one has travelled abroad or not. Presumably, respondents from the LDHC areas who have no history of

travel may have been sexually exposed to other HIV infected individuals with a history of travel. The infection of people with no reported history of travel might lend support to the assumption within the conceptual framework that although HIV was initially introduced from abroad, its growing prevalence and spread are determined by favourable social and cultural conditions in the local environment. Through sexual networking 40.0 percent of the patients reported contracting sexually transmitted diseases in the past. Between 1994-1995, 283 cases were reported at the STD clinic at the Adabraka polyclinic from all over the metropolis. Twelve out of the 283 were diagnosed to be HIV positive. Of the 12 HIV cases, three were diagnosed in 1994 and the remaining nine in 1995.

### 5.3 RETURN OF MIGRANTS

Of comparable significance in this regard is also the transportation network. This has the effect of not only improving accessibility but also of increasing the contact and information field of individuals and the growing high risk sex enterprise. It is partly for this reason that transportation network is regarded in the conceptual framework as a vital factor in the spread of AIDS.

Even though it is argued that the growing prevalence and spread of AIDS are determined by the local environment, the role of returning migrants who are usually young people who may have indulged in high risk sexual behaviour and exposed themselves to HIV while abroad should not be overlooked. Notable in this regard is the relatively developed transportation network within the metropolis and between the metropolis and areas outside of it. The existing linkages have the effect of not only improving accessibility but also of increasing

the contact and information fields of individuals and consequently facilitating a commercial sex enterprise. It is for this reason that transportation network is regarded in the conceptual framework as a vital factor in the spread of AIDS in Accra.

Among the migrants who had returned from domestic travel 23.0 per cent reported having casual sex during their travels. Among those who had travelled abroad 52.0 per cent reported having casual sex while abroad and 15.0 per cent had regular partners also returning from abroad. All these people might have exposed themselves to HIV and consequently returned with infection.

Poverty and the search for greener pastures abroad, the fascination and attraction that travel abroad brings to young people, youthful adventure, trading, peace-keeping duties and movement away from areas of armed conflict and natural disaster are all important considerations in this regard. Almost 90 per cent of reported AIDS in Accra occur in young and heterosexually active people between the ages of 20-49 years. In spite of their current residence in the metropolis most of them might have migrated from areas outside Accra to live and work (as traders, soldiers, street porters or even prostitutes), to seek adventure, or to enjoy their perceived fascinations about urban life. As the only port of entry for international travel into Ghana, Accra also receives all those with AIDS returning from abroad by air.

#### 5.4 RESISTANCE TO AIDS SPREAD

Spatial diffusion studies reveal the existence in every community of areas of resistance or barriers to the spread of specific types of innovation. Resistance is often the product of social and other attributes, which make it difficult for potential adopters to appraise correctly the value or importance of an innovation. Such attributes may be educational, religious, ethnic, class or income group in origin. For instance in Accra differences in social attributes such as average income and employment status between areas such as East Legon in the LDND and Mamobi in the HDLC areas might explain their contrasting degree of prevalence of AIDS

Resistance, however, can be broken under the influence of persistent communication. Where the resistance is so formidable that it not only defies all interactive relationships but also makes it difficult for the innovation to spread beyond the resisting area, a barrier is created. Within the Accra metropolis, no physical barriers to movement such as highlands and large water bodies exist to hamper movement and interpersonal contact. The fact that in general the links of communication tend to be a decreasing function of distance cannot be responsible for the area differentials noted in the diffusion of AIDS in Accra. The limited probability of contact may not be so much the difficulty of movement as the character of social relations. Even though the precise spatial range of regular sexual contacts cannot be ascertained in this study, minority of the population may be assumed to have wide contact areas. The rate of spread is limited by inter-area relations and is determined by the compatibility of high-risk sexual behaviour with individual values and persuasion. The connection has been largely informal.

Innovations may be adopted when they are diffused into an area when the time and conditions for them are right and appropriate. If the prevailing openness to commercial sex and promiscuity in Accra are poverty-derived, then poverty alleviation measures are in the long term required to stop AIDS from undermining the health of especially young people and its wide ranging consequences for self-confidence, illness and death. Reactions in favour of social preservation by government, non-governmental agencies, Churches, the media and other pressure groups are attempts at creating resistance and barriers against the process of diffusion of AIDS spatially.

## CHAPTER SIX

### COMMON PERCEPTIONS AND ATTITUDES

#### 6.1 PERCEPTION

An individual's perception is governed by past experiences and present outlook conditioned by values, moods, social circumstances, and expectations. Hence, two people viewing the same stimulus may 'see' different images. Attitudes on the other hand imply an individual's feelings toward and beliefs about an object. Tuan (1976) proposed that Geography should promote an understanding of the human world by studying people's relations, behaviour, feelings, and ideas in regard to space and place.

Perception and attitude studies may be pursued with a number of interests in mind: to identify problems, opportunities, or alternative strategies, to determine how well perceptions relate to reality, or to ascertain how stable perceptions and attitudes are. All of these aspects sensitise resource managers to public opinion, and indicate opportunities for information and education programmes. The complexity of this task reinforces the argument put forward by Webb et al. (1966) that multiple methods are required to ensure reliable and valid data. Several studies have cautioned against the reliance on one-shot questionnaire surveys to ascertain or establish perceptions, attitudes, and behaviour (Tuan, 1976; O'Riordan, 1976; Saarinen, 1976). With such limitations of the questionnaire survey in mind, this section attempts to pinpoint some common and divergent viewpoints in perceptions and attitudes that occur between and among individual

AIDS patients, AIDS managers and a cross-section of the general public observed in the study.

## 6.2 ON STDS AND SAFER SEX

Five percent of respondents from the general public had contracted STD in the past, 80 percent had no STD record, and the rest did not disclose whether they had ever been infected (see table 6 below)

Table 6 STD history reported by the general public

<b>STD and predisposition to HIV/AIDS among the general public (%)</b>	
History of STD	5
No history of STD	80
Not stated	15
Total	100

Gonorrhoea and syphilis were reported as common infections they had suffered. As to whether their own past STD experience had not exposed them to HIV, the response from the general public was no.

While 97 per cent had heard about AIDS through the mass media, 3 per cent claimed to be ignorant about it. A comparable 7 per cent of patients had not heard about AIDS until they were diagnosed as victims. This is consistent with observations that people have a fairly good idea about HIV/AIDS because of the publicity given to the disease in the mass media (Awusabo-Asare, 1995; McCombie and Anarfi, 1992). Eighty-eight per cent of the general public perceived sexual intercourse to be the major channel of transmission of the virus compared to fifty-five per cent of patients who also conceded contracting the virus through sex. Two and a half per cent and three per cent of patients and

general public respectively perceived blood transfusion and the use of infected instruments as channels of transmission.

In some measure, the knowledge of AIDS has affected the sexual habits of the general public. This was admitted to by 54 per cent, denied by 30 per cent with 13 per cent not being so sure if any change in sexual habits have taken place (see table below)

Table 7 Reported post-AIDS sexual habits in the general public

<b>Post-AIDS sexual habits among the general public (%)</b>	
Change in habit	54
No change in habit	30
Not sure	13
Not reported	3
Total	100
<b>Types of change in habit reported (%)</b>	
Sticking to regular partner(s)	28
Using condoms	5
Other measures	17
Not stated	50
Total	100

Among those whose sexual habits have changed, twenty-eight per cent reported that they were sticking to their regular partners only, 5 per cent were using condoms, and 17 per cent were taking other precautionary safe sex measures such as withdrawal method and abstinence. The rest reported nothing.

### 6.3 AIDS AWARENESS

Ninety-five percent of respondents had been aware of their condition of AIDS within the past twelve months. They all found this out from hospitals. Fifty-five percent conceded they may have contracted the virus through sex, 2.5 percent

believed they were infected through blood transfusion, 35 percent were not sure how they came into contact with the virus while 7.5 percent said nothing about how they might have become infected. Thirty-eight percent admitted having practiced unprotective sexual intercourse while the rest (62 per cent) claimed to have taken precaution. Seventeen and a half per cent had partners who were confirmed HIV positive while 25 percent had HIV negative partners. Fifteen percent could give no indication whether their partners were HIV positive or not and 42 percent did not respond. For 15 percent, partners were already showing clinical symptoms of AIDS. The rest had partners who were still healthy.

Before infection, 88 percent of respondents from all the seven residential sectors had heard about AIDS. On the contrary, 7 percent had not heard anything about AIDS while 5 percent did not indicate if they had heard about the condition. Respondents from HDLC (New Town) and LDMC (Dansoman) reported no knowledge about AIDS.

Information about AIDS was derived by respondents primarily from the mass media. Allowing for multiple responses, 65 per cent cited radio and television and 22 percent cited friends. The rest either did not indicate their source of information or had not previously known about AIDS. AIDS was said to result from promiscuity and homosexuality. Other attributes mentioned less often were that it had to do with a weak immune system, that it originated from Africa or the United States, that it was a punishment by God and that it was transmitted from animals. The perceptions observed necessitate further examination, not merely of media-conditioned attitudes towards sexual relationships and AIDS, but of how

various sections of the population have come to regard their inter personal relationships, habitats and the reality and/or the illusion of AIDS.

#### 6.4 COPING WITH AIDS

It is important to remember the personal dimension that the condition of AIDS and the patient are not the same thing (Malcolmson, 1988). A wide range of psychological and social considerations affects an individual's experience of AIDS. Moreover, the way in which someone is initially infected may have much bearing on subsequent events. In this respect, the experience of a young woman who is married off to a polygamous elderly man may be very different from that of a prostitute. Similarly, the experience of someone diagnosed with AIDS by accident may be very different from that of another person already known to be HIV positive. Geographical factors such as proximity of individuals to health services and support groups, may affect how they cope with AIDS.

Many people with AIDS face the difficult task of informing family and friends of their diagnosis. One HIV positive young woman whose husband had died of AIDS and was receiving counselling had decided not to tell her own family nor her late husband's family about her HIV status. If she did, not only will her late husband's family not accept that their member had acquired and died of AIDS, they will also accuse her of involvement in witchcraft. Besides, her own family will blame her for bringing shame to them. This woman has three children, the last of whom is also HIV positive. By tradition, she is supposed to be given to her late husband's brother as an 'inherited wife'. Should this happen, the beneficiary husband and all her co-wives, extra partners (if any) and children born after this

period will all be at risk of HIV infection. If she refuses to undergo the traditional rites, her family will be required to pay a substantial compensation, which they cannot afford to her late husband's family and will also be ridiculed by the society. This is just one instance of the consequences of ignorance, hostility and prejudice surrounding HIV and AIDS. Infected people face an uncertain future and are unable to disclose their condition to even those very close to them for fear of rejection and discrimination. They are condemned to silence on the very subject they most need to talk about at a time when they are afraid and insecure.

Table 8 Reported patients' response to their condition of AIDS

<b>Patients' response to their HIV/AIDS condition (%)</b>	
Attending clinic and counselling	42.5
Self medication	30
Praying to God	27.5
Total	100
<b>Degree of dependency of patients (%)</b>	
On relatives	37.5
On spouse(s)	25
On self	15
On friends	2.5
On others	15
Not stated	5
Total	100
<b>Expectation of care (%)</b>	
Expecting family to do more	32.5
Uncertain about what to expect	68.5
Total	100
<b>Reaction of spouses to their AIDS status (%)</b>	
Sympathetic	20
Unsympathetic	10
Indifferent	10
Outraged	3
Not stated	57
Total	100

On their own, 42.5 per cent of respondents were attending clinic for check up and counselling, 30 per cent were depending on drugs and other forms of medication and the rest were praying and awaiting the end. Within family and society, 37 per cent were dependent on relatives, 25 per cent on spouses, 15 percent on their own resources and another 15 per cent on others who were neither spouse, relatives or friends. Two per cent were dependent on friends and 5 per cent disclosed nothing about who provided for their upkeep. Notably, only 15 per cent depended entirely on their own resources for survival. Whereas the data does not show whether the patients are poor as a result of their condition or that their condition has impoverished them, it shows clearly a correlation between the condition of AIDS and poverty and between AIDS and dependency.

Thirty-two and a half per cent of respondents believed the family could do more with the rest either not expecting any help or uncertain about what to expect. Seventy-two per cent had found community support services by way of chemical shops, pharmacies, doctors, traditional healers, pastors and spiritualists and friends very helpful. The rest had either found no help from such support or were plainly indifferent.

For 20 per cent, spouses had been sympathetic and for 10 per cent, they had been unsympathetic. Ten per cent had spouses who had been indifferent to their condition and 3 per cent had spouses showing outrage. Fifty-seven per cent did not indicate how their spouses felt about their condition. It may well mean that they no longer had any spouse(s) because of their condition. This is consistent with Awusabo-Asare's (1995) suggestion that family ties and community relations

in African societies are under strain, perhaps because of HIV/AIDS infection. Contrary to expectation, family members have been outraged or indifferent, creating conditions of despair and hopelessness for the sick. In a situation where there is no intensive care for AIDS patients in hospitals and home-based care is provided by families, showing of sympathy or the lack of it, by parents, siblings, children, other relations, friends, neighbours, and spouses have implications for social relations in families and communities within the Accra metropolis.

### 6.5 AIDS IN THE COMMUNITY

Among persons with AIDS only 2.5 per cent held the view that living in their particular residential communities had contributed to their condition of AIDS. Seventy-seven and a half per cent did not share the view that living in their particular residential communities had contributed to their condition of AIDS. As it were, the majority blamed external communities for their plight. Although they failed to show how, it may be logical to infer that these are people who had travelled around and had been infected in their sojourn. Twenty per cent made no comments on the relationship between their condition of AIDS and their place of current residence.

Among the general public, 17 per cent perceived their communities to be high risk neighbourhoods, 42 per cent disagreed that their areas of current residence were AIDS-prone and 40 per cent were not sure if their areas were susceptible to AIDS or not. On the probability of contracting AIDS from their communities, 12 per cent thought it was high, 58 per cent though it was low, 18 per cent thought it

was very low and another 12 per cent did not express any opinion. Thus, most people perceived their communities to be safe from HIV and AIDS.

On areas one needed to be careful in for reasons of AIDS prevalence, 67 per cent were not sure, 10 per cent perceived MDIS, 8 per cent perceived LDMCS, HDIS and MDMCS shared 5 percent respectively, 3 per cent perceived HDLCS and 2 per cent perceived LDNDS. Whereas the study observed MDMCS as the area with the highest proportion of reported cases (25%) MDIS rather is perceived by the general public as having communities to be careful in because of AIDS. While 53 per cent did not explain their reasons for labelling certain places as high- risk areas, 38 per cent attributed it to prostitution. Other reasons bordering on speculation and hearsay was 9 per cent.

Ignorance, speculation, superstition, and traditional beliefs are common features of perception observed in both patients and non-patients. These influences may perhaps have hindered people from understanding their predicament in relation to their social, economic and cultural circumstances.

## 6.6 MANAGEMENT OF AIDS

About 83 per cent of the general public believed that the surest way to control AIDS was through abstinence and protective sexual practices and 3 per cent believed that drugs, medicaments or a vaccine must be found to control or cure AIDS. Twenty-two and a half per cent and 5 per cent of patients shared in the respective views expressed by the public on control. Two per cent of the public held that Church-based campaigns must be undertaken to control AIDS and

another two per cent held that AIDS patients should be isolated. This latter view expressed by people neither affected by HIV nor AIDS was not shared by any patient.

Twenty per cent and two per cent of patients and public respectively could not tell what must be done to control AIDS and 2 per cent respectively expressed no opinion at all. Five per cent of the public held that the whole notion about AIDS might be a hoax, which should not be believed. A number of reasons may be found for advancing the hypothesis that AIDS decision makers differ from AIDS patients, their relations, high risk sexual activists and indeed the general public in their perception, interpretation and evaluation of AIDS factors. More detailed research among the general public especially among specific subgroups such as high-risk sexual activists and the doubtful.

## CHAPTER SEVEN

### SUMMARY AND CONCLUSIONS

#### 7.1 OVERVIEW

This study is based on the belief that the relationship between man's environment and diseases exhibits particular characteristics expressed in terms of population and involves physical, biological, socio-economic and spatial components. Patterns of morbidity, mortality, health, and health care are presumed not to occur randomly in human populations but in ordered forms to reflect underlying causes. Knowledge of high-risk behavioural patterns for instance should provide a key to an understanding of causation and provide a basis for the development of methods of prevention and control. In this study, the spatial distribution of actual cases of AIDS, the behavioural patterns of HIV infected individuals and some perceptions of patients and non-patients on the socio-economic and environmental connections to AIDS prevalence in residential areas of the Accra metropolis are investigated.

Table 3 showed the classification of residential areas of Accra into socio-environmental zones. The high-density areas generally had less favourable socio-environmental conditions than the low-density areas, and residence in privileged or deprived areas appeared to be predicted by socio-economic status and educational achievement.

## 7.2 AIDS CONTROL MEASURES

One misconception about HIV and AIDS is the belief that groups affected by the epidemic such as prostitutes are somehow the cause of it. Just as in the past infectious diseases were commonly attributed to the air, climate, or the seasons, so it is today to regard particular lifestyles as the cause of illness. This situation is complicated by the fact that groups for which HIV and AIDS have been associated in Accra are generally looked upon with contempt. The extent to which AIDS continues to be portrayed as an outward sign of an inner moral and sexual turpitude is related to the survival of pre-modern perceptions of health and human sexuality. HIV, like any other virus is no respecter of persons. In reality, HIV can infect anyone, and it has had devastating effects on widely divergent social groups in different parts of the world. An awareness of the different social and spatial contexts in which sexual relationships take place is essential for effective AIDS control measures since, unless we understand what people actually want, like and do sexually, we cannot identify successful strategies to minimise the risk of further infection.

The spatial impact of AIDS in the Accra metropolis cannot be predicted with precision because of inadequate monitoring and under-reporting. While the numbers of reported cases continue to increase, neither privileged nor deprived residential communities are free from the increasing risk of HIV-infection. Strategies to control the spread both in numbers and in space should be intensified and made more widespread. Information and education programmes must be extended particularly to young and sexually active people in the high-density sectors of the city. Targeted condom distribution and free condoms to

prostitutes, which have resulted in reduced infection rates in Kenya (World Bank, 1989), could be adopted for Accra. Additionally, effective and regular counselling of HIV seropositives to reinforce behavioural patterns that could reduce the spread of infection, as well as, quick diagnosis and treatment of STD victims who are much vulnerable to HIV must be pursued. Finally STD control programmes must be integrated into family planning, maternal and child health and primary health care services at all levels and in all health institutions in the metropolis.

### 7.3 DEATH AND GRIEVEMENT

Modern attitudes perceive death as either general or in the future or individual and in the present. It is rarely ever taken together. AIDS has inexorably altered this perception. Aggleton *et al.* (1989) argued that whilst we should beware of a tendency to idealise a mythical and non-existent past in which matters of death were coped with more efficiently than they are today, we should recognise that nothing has prepared us for the reality of AIDS. The emphasis on the mortality rates of people with AIDS has produced an atmosphere of unparalleled fatalism concerning the syndrome. According to Cooke (1987), in such an atmosphere, even intellectual sophistication is no antidote to fear. Without doubt, care of people with AIDS is difficult. There is far too little to be done in the face of a relentless destruction of body and mind. In the months and years ahead, AIDS workers must learn to be cheerful but realistic in their work with people with AIDS especially as patients become more dependent and more demanding with progression. Despite the difficulties, many doctors, nurses, families, and friends are delivering AIDS care with grace, compassion, and strength.

People with AIDS should be helped to make informed choices on aspects of their daily lives. This should include making decisions about life-sustaining treatments, which may take place after the person concerned is mentally unable to participate in decision-making. It should also make provision for eventual death.

In the same way that people with AIDS need to feel loved and cared for, so their companions, friends, families, nurses and doctors need the opportunity to share their own emotions. The sadness and anger that is felt whenever AIDS claims another patient, friend or loved one is an important part of the natural history of the disease which cannot simply be dismissed.

Living with AIDS and its various consequences is an issue for the entire community, and it is to the community as a whole that we must look for support and resources to help us through the difficult years which lie ahead.

#### 7.4 PLANNING FOR THE FUTURE

AIDS is a public health issue not a moral one. It will require resource, imagination, goodwill and determination (Rayner, 1987). Regardless of any success in educating people on how to avoid infection, AIDS is not going to go away. Patients will need care and support to be able to cope with their terminal illness and death. The development of support services is a challenge to the health service, the metropolitan assembly, families, friends, and indeed, every member of society. Hospital outpatient care for people with AIDS is still in the early stages of development, but will increasingly function as a bridge between hospital services and community care. The metropolitan assembly will have to

develop clear policies concerning people with AIDS and make special provision for children with AIDS and children of people who die from AIDS. Long term provision for local community AIDS initiatives should be made a priority. Preparedness, consistency, and client-centred lines are some of the key principles for developing local strategies. Local voluntary sector AIDS agencies should be encouraged to provide complementary support to what is provided by statutory agencies.

## 7.5 CONCLUSION

It is observed in this study, that, although AIDS may be found in all the zones, its distribution is not even. Differentials exist between socio-economic zones. While the initial introduction of HIV may be associated with individuals rather than with socio-environmental conditions, the subsequent development of opportunistic respiratory and other infections such as pneumonia and tuberculosis may well have links with environmental risk factors such as crowding. The scale of differential in AIDS prevalence between the privileged and deprived residential neighbourhoods in the city is thus underpinned by socio-economic and environmental risk factors. Although all of these factors have not been established, the one that is most commonly agreed upon is variation in sexual behaviour. Sexual behaviour in AIDS-prone areas of the Accra metropolis relates directly to the oft-cited factor of multiple sexual partnerships and the consequent development of complex sexual networks. Relatively low condom user rates, reluctance on the part of AIDS patients to consult medically-trained personnel, inappropriate self-medication, inadequate AIDS prevention and treatment

programmes and, perhaps, lack of complementary treatment from traditional sources may also be important co-factors in the prevalence patterns observed.

However, the causes of the growing AIDS prevalence in the Accra metropolis may be a derivative of poverty and its consequences rather than presumed exotic sexual practices and promiscuity. As Konotey-Ahulu (1988) observed, the size and pattern of the city's AIDS problem have much to do with the poverty-related prostitution pool, and this directly involves females normally resident in deprived areas with little or no formal education. Holmberg *et al.* (1990) reported that infection in partners of HIV-infected persons is not determined solely by numbers of sexual encounters, but also by multiple biological factors of which genital ulcerative disease is probably a major determinant. It may not be difficult to relate genital ulcerative disease and, indeed, general personal hygiene to poverty and educational status. In that regard, high density socio-economically deprived areas such as Sabon Zongo, Sukura, Russia, Nima, Maamobi, Darkuman and James Town, described as having high rates of infectious disease mortality in a study by Housing and Development Associates (1990), may be more prone to AIDS than affluent areas such as Ridge, East Legon and Cantonments.

A geographic relationship between migration and AIDS prevalence is observed in this study. Migration increases the number of sexual partners and thus reinforces sexual networks. Fifty-five per cent of respondents confirmed having travelled abroad in the recent past with 53 per cent of them reported casual sex. The 45 per cent who had not travelled recently and the 47 per cent who did not

report casual sex were elements in the subsequent contagious diffusion of HIV in areas of the city with high-risk sexual activity.

Since HIV or AIDS itself is no disease but a weakening of the human body's natural defence to an extent where it is unable to fight off opportunistic infections that the body would under normal circumstances fight off with ease, it may possibly be linked to several communicable diseases. Hence, the current levels of mortality especially in high-density areas of Accra may well have a possible connection to the AIDS related complex. The concern for high density areas is driven by the fact that 67 per cent of Accra's population live in high density areas and they appear to be at 2-3 fold risk of death from diseases in comparison to their counterparts living in the more affluent areas (Songsore and McGranahan, 1993; Stephens and Avle, 1993).

A healthy citizenry contributes to the social cohesion of a country and imparts dynamism to all aspects of its life and culture. Thus in the Accra metropolis the existing social environment of the majority of the people should become the starting point for metropolitan development effort. While investment in physical capital such as roads, water and sanitation projects, wastes management, markets, housing and other social amenities is an important aspect of stimulating economic growth and technological transformation, investment in human resources such as health and education should be perceived as a necessary component of stable and sustainable progress. Most importantly, investment in human resources must not merely be regarded as an adjunct to economic growth, but rather as a powerful and necessary driving force for all aspects of

development. After all, a stable metropolitan economy and political order cannot be built in an unhealthy society.

The task of controlling AIDS should not simply be one of developing a vaccine or other curative measures. Changes in beliefs, attitudes, and ultimately behaviour towards sex are also necessary. Close attention to high risk sexual activist prone to AIDS and living in poverty stricken sectors of Accra as well as children born to them should be an urgent priority. With almost 90 per cent of all reported AIDS cases occurring in adults between the ages of 20 and 49 years (NACP, 1996), AMA's progress will be hampered since the enormous challenge of development cannot be supported by people whose every thought is bent towards recovery from debilitating illness.

## BIBLIOGRAPHY

1. Adler, M.W., and Piot, P. 1988. Overview AIDS 2 (Suppl.1): 3 47-S48.
2. Africa (Commentary) *Annals of the Association of American Geographers* 80:300-01
3. Agadzɔ, V.K., 1989. AIDS: the African perspective of the killer disease. Ghana Univ. Press, Accra.
4. Aggleton, P *et al.*, 1989. AIDS: Scientific and social issues: a resource for health educators. Churchill Livingstone. Longman UK.
5. Altman, L.K. 1995. AIDS is now the leading killer of Americans from 25-44. *The New York Times*, Jan. 31, C7.
6. Ampofo, A. A 1993. Women and AIDS in Ghana: "I control my body": women and demographic change in sub-Saharan Africa. *IUSSP Committee on Gender and Population*. Dakar Senegal.
7. Anarfi, J.K. 1993. Sexuality, migration and AIDS in Ghana. *Sexual Networking and HIV/AIDS in West Africa*, ed. J.C. Caldwell *et al.* Supplement to *Health Transition Review* 3. Canberra: Australian National University Pp. 45-68
8. Anarfi, J.K., 1992. The conditions and care of AIDS victims in Ghana – AIDS sufferers and their relations. Paper presented at Workshop on AIDS, Ado Ekiti, 22-26 August.
9. Anarfi, J.K. and P. Antwi. 1995. Street youth in Accra city: sexual networking in a high-risk environment and its implications for the spread of HIV/AIDS. *Health Transition Review*, Supplement to vol. 5 pp. 131-151.
10. Anarfi, J.K. and K. Awusabo-Asare. 1993. Experimental research on sexual networking in selected areas in Ghana. Pp. 29-43 in *Sexual Networking and*

- HIV/AIDS in West Africa*, eds. J.C. Caldwell et al. Supplement to *Health Transition Review* 3. Canberra: Australian National University.
11. Angwafo, A.V., 1994 "On AIDS in Africa" *Health Net Mail Point* Nov. 30.
  12. Ankrah, E.M., 1993. Family provision of care to persons with AIDS in urban and rural Uganda. International Conference on AIDS, 6-11 June. Abstract PO-D22-4086.
  13. Ankrah, E.M., 1993. The impact of HIV/AIDS on the family and other significant relationships: the African clan revisited. *AIDSCARE* 5(1):5-22.
  14. Ankrah, E.M. et al., 1992. Stress and coping among rural families in Uganda. International Conference on AIDS. Amsterdam 12-24 July. Abstract Th.G.P.19.
  15. Ansary, M.A. et al., 1989. A colour atlas of AIDS in the tropics.
  16. Antwi, P., S. Tipping, O.M. Kumah et al. 1993. AIDS awareness and high-risk behaviour in Ghana: results of a national survey. VIIIth International Conference on AIDS in Africa, Marakesh.
  17. Armstrong, J., 1991 Socio-economic implications of AIDS in developing countries *Finance and Development* Vol. 28 No. 4. Pp.14-17
  18. Awusabo-Asare, K., J.K. Anarfi and Women's control over their sexuality and the spread of STD and HIV/AIDS in Ghana.
  19. Awusabo-Asare, K. and D.K. Agyeman. 1993. Social science research and the challenge of the AIDS epidemic: Ghana data. Pp. 357-368 in *International Population Conference Montreal 1993*. Liege: IUSSP
  20. Azonga, T.M., 1994 Making AIDS an Issue, *West Africa* June 1994 Pp 990-991

- 21 Bleek, W. 1987. Lying informants: a fieldwork experience from Ghana, *Population and Development Review* 13,2:314-322.
- 22 Caldwell, J.C., I.O. Orubuloye and P. Caldwell, 1994. Methodological advances in studying the social context of AIDS in West Africa. Pp. 1-12 in *Sexual Networking and AIDS in Sub-Saharan Africa: Behavioural Research and the Social Context*, eds. I.O. Orubuloye, J.C. Caldwell, P. Caldwell and G. Santow. Canberra: Australian National University.
23. Caldwell, J.C., and Caldwell, p. 1993. The nature and limit of the sub-Saharan African AIDS epidemic: evidence from geographic and other patterns, *Population and Development Review* 19(4):817-848.
- 24 Caldwell, J.C., P. Caldwell and T.C. Quiggin. 1989. The social context of AIDS in sub-Saharan Africa. *Population and Development Review* 15(2):185-226.
- 25 Cliff A.D., P. Haggett, J.K. Ord and G.R. Versey. 1981. Spatial diffusion: an historical geography of epidemics in an island community. Cambridge, Cambridge University Press.
26. Cliff, A.D. and P. Haggett, 1989 Spatial aspects of epidemic control. *Progress in Human Geography* 13:315-47
- 27 Delamothe, T. 1990. AIDS predictions halved. *British Medical Journal* 300:352.
- 28 Dutt, A.K., C.B. Monroe, et al. 1987. Geographical patterns of AIDS in the United States *The Geographical Review* 77:456-71.
- 29 Gallo, R.C. and L. Montagnier. 1989. The AIDS epidemic. *The Science of AIDS* Pp. 1-11 New York: W.H. Freeman.

30. Gardner, L.I., J.F. Bundage *et al.* 1989. Spatial diffusion of the human immunodeficiency virus infection epidemic in the United States, 1985-1987. *Annals of the Association of American Geographers* 79:25-43.
31. Gould, P 1993. *The slow plague*. Blackwell, London.
32. Gould, P 1989. Geographic dimensions of the AIDS epidemic. *The Professional Geographer* 41:71-78.
33. Green, E.C. 1992. The anthropology of sexually transmitted disease (STD) in Liberia, *Social Science and Medicine* 35(12):1457-1468.
34. Haggett, P 1992. Sauer's 'Origins and Dispersals', Its Implications for the geography of disease *Transactions of the Institute of British Geographers* 17(4):387-398.
35. Haran, D., D. Dovlo and A. Offei. 1994. The quality of care in hospitals and health centres in Eastern Region, Ghana: a view from the patients. *Quality of Care Programme Report No. 2 MOH*.
36. Iyun, F 1981.
37. Iyun, F. 1983. The determinants of disease risk-cell areas in Ibadan city, *Geoforum* 14(2):211-222.
38. Jeanneney, J., 1987. AIDS - a re-run of the syphilis story *trans.* from an article in *Le Monde* of Thursday July 16th.
39. Kilbourne, E.D. and W.G. Smillie, eds. 1971. *Human Ecology and Public Health* Macmillan, London Pp. 125-150.
40. Konotey-Ahulu, F.I.D., 1989. *What is AIDS* Watford, England?
41. Konotey-Ahulu, F.I.D., *Lancet* p.22.
42. Learmonth, A. 1988. *Disease Ecology: an introduction* Basil Blackwell, Oxford Pp. 1-16, 25-33, 98-121, 348-363.

43. Loytonen, M., 1991: The spatial diffusion of HIV type 1 in Finland, 1982-1997. *Annals of the Association of American Geographers*, 81(1):127-151.
44. Mann, J., 1987. Speech to the United Nations General Assembly, October 20th.
45. Matthews, S.A.. 1991: The geography of AIDS: the origins and course of an epidemic.. G.W.Shannon, G.F. Pyle and R.L. Bashshur (Book Review) *Annals of the Association of American Geographers* 82:412-13.
46. May, R.M., and R.M. Anderson. 1987. Transmission dynamics of HIV infection. *Nature* 326.
47. McGrath J.W. et al., 1993. Anthropology of AIDS: the cultural context of sexual behaviour among Baganda women in Kampala, Uganda. *Social Science and Medicine* 36:429-39.
48. Mckenzie, W.J.M., 1961. Theories of local government. London: London School of Economics and Political Science.
49. Ministry of Health (MOH), 1992. *A nation united against AIDS*, 3rd National Seminar on AIDS Report.
50. Ministry of Local Government, Department of Town and Country Planning. 1992. *Strategic Plan for the Greater Accra Metropolitan Area Vol. 2*.
51. Ministry of Local Government, Accra, United Nations Centre for Human Settlement, Town and Country Planning Department. 1990. Demographic studies and projections for Accra Metropolitan Area (AMA) Final Report
52. Mony-Lobe, M. et al. 1989. HIV infection and prostitution in Yaounde – Cameroon *V International Conference on AIDS*, Montreal 4-9 June, Abstract Th D P 22.

53. National AIDS Control Programme (NACP). 1996. AIDS in Ghana: background projections, impacts, interventions. Ministry of Health, Accra.
54. Nyarko, E., B. Doe, C. Stephens, D. Tetteh, S. de-Younster, and T. Williams. 1993. *Crowding and Health in Low Income Areas of Accra: A Case study using Existing Data*. Report.
55. Neequaye, A.R., *et al.* 1987. Human immunodeficiency virus (HIV) Infection in Accra. *Ghana Medical Journal* 1: 3-6.
56. Neequaye, A.R. *et al.*, 1986. Preponderance of females with AIDS in Ghana. *Lancet*, ii: 978.
57. Neequaye, A.R. *et al.*, 1987. Sexual habits and social factors in local Ghanaian prostitutes which could affect the spread of human immunodeficiency virus (HIV). *Ghana Medical Journal*. 21:12-15.
58. Neequaye, A.R. *et al.* 1988. Dynamics of human immunodeficiency virus (HIV) epidemic - the Ghanaian experience. *The global impact of AIDS* New York, A.R. Liss Pp. 9-15. Ed. A.F Fleming.
59. O'Riordan, T. 1971. Perspectives on resource management.
60. Orubuloye, I.O., J.C.Caldwell and P Caldwell. 1992. Diffusion and focus in sexual networking: identifying partners and partner's partners. *Studies in Family Planning* 23:343-51.
61. Panos Dossier 1990. Who cares, who pays? Triple jeopardy – women and AIDS. London: Panos Institute.
62. Panos Dossier 1992. The hidden cost of AIDS. London: Panos Institute.
63. Pickering, J., and Robbin, J.E. 1989. Geographical information system, census data and forecasting in the United States.
64. Quartey *et al.*,

65. Quinn, T.C., J.M. Mann, J.W. Curran and P. Piot. 1986. AIDS in Africa: an epidemiologic paradigm. *Science*, 234:955-963.
66. Rees, M. 1990. Short-term prediction of HIV infection and AIDS: A critique of the working group's report to the Department of Health. *International Journal of STD & AIDS* 1 10-17.
67. Saarinen, T.F., 1976. Environmental planning: perception and behaviour. Boston: Houghton Mifflin.
68. Shannon, G.W. and G.F Pyle. 1989. The origin and diffusion of AIDS: a view from medical geography. *Annals of the Association of American Geographers* 79:1-24.
69. Shannon, G.W., G.F. Pyle and Bashshur, R.L. 1991 *The geography of AIDS*. New York. Guildford Press.
70. Shannon, G.W., and C.W. Spurlock. 1976. The urban ecological containers, environmental risk-cells and the use of medical services. *Economic Geography* 52(2):172.
71. Smallman-Raynor, M.R. and A.D. Cliff. 1991. The spread of human immunodeficiency virus type 2 into Europe: a geographical analysis. *International Journal of Epidemiology* 20:480-489.
72. Smallman-Raynor, M.R. and A.D. Cliff. 1991. Civil war and the spread of AIDS in Central Africa. *Epidemiology and Infection* 107:69-80.
73. Smallman-Raynor, M.R., and A.D. Cliff. 1990. Acquired immunodeficiency syndrome (AIDS): literature, geographical origins and Global patterns. *Progress in Human Geography* 14:157-213.

74. Stephens, C and Avle, S. 1993. Environment and Health in Developing Countries: An analysis of Intra-Urban Differentials Using Existing Data. Summary of preliminary results for Accra. (Draft report).
75. Songsore, J., and McGranahan, G., (1993) "Environment, Wealth and Health: an analysis of intra-urban differentials within the Greater Accra Metropolitan Area, *Ghana Environment and Urbanization* 5(2):11-34.
76. Standing, H., 1992. AIDS: conceptual and methodological issues in researching sexual behaviour in sub-Saharan Africa. *Social Science and Medicine* 34(5):475-483.
77. Stephens, C. *et al.* 1994. Environment and health in developing countries: an analysis of intra-urban mortality differentials using existing data. Collaborative studies in Accra, Ghana and Sao Paulo, Brazil (unpublished).
78. Sutherland, S. and T.J. McManus. 1989. HIV seroprevalence in injecting drug users in South London 1985-88. *V International Conference on AIDS, Montreal 4-9 June, Abstract T.A.P.55.*
79. Thouez J.P. Ghadirian, P. and Connell, K. 1987. The geography of AIDS in Canada and the United States. *Proceedings, Xth International Conference on the Social Sciences and Medicine, 1987, Sitges, Spain.*
80. Tuan, Yi-Fu 1974. *Topophilia: a study of environmental perception, attitudes and values.* Englewood Cliffs: Prentice-Hall.
81. UNAIDS. 1996.
82. US Bureau of the Census. 1993. Trends and patterns of HIV/AIDS infection in selected developing countries *Country Profiles Research Note No.10 June.*

83. Ward, Rinehart. 1986. AIDS-public health crises - editor's summary. *Population Reports: Issues in World Health Series L. No.6. July-August. Pp. L.-193-94.*
84. Webb, E.J. *et al.*, 1966. Unobtrusive measures: nonreactive research in the social sciences. Chicago: Rand McNally Sociology Series.
85. Winkler, E., *et al.* 1989. Seroepidemiology of human retroviruses in Gabon. *AIDS 3:106-107.*
86. Winn, S. 1988 The Developing Geography of AIDS: A Case study of the West Midlands. *Area 20:61-67.*
87. World Bank 1994 *World Development Report 1993: investing in health.* New York: Oxford University Press.
88. World Health Organization (WHO). 1990. *Current and future dimensions of the HIV/AIDS pandemic A Capsule Summary Pp. 6-7.*
89. WHO Weekly epidemiological Report(s) on AIDS 1986-90.
90. Wood, W.B. 1988. AIDS north and south: diffusion patterns of a global epidemic and a research agenda for geographers. *The Professional Geographer 40, 266-79.*