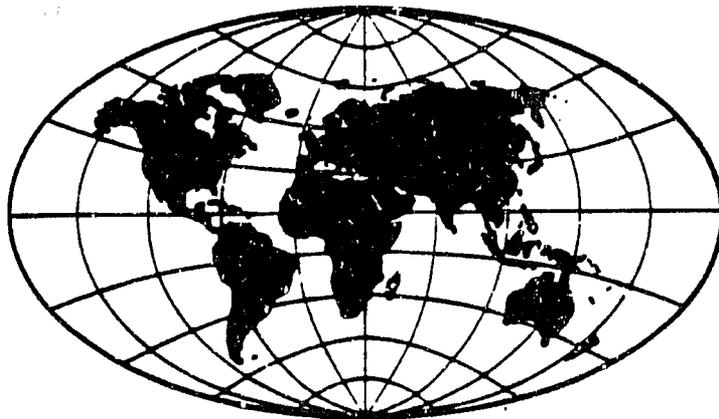


PN. ABU-111
25265

AN EPIDEMIOLOGICAL REVIEW OF HIV/AIDS IN SUB-SAHARAN AFRICA

by
Peter O. Way
Karen A. Stanecki



**Center for International Research
U.S. Bureau of the Census
Washington, D.C. 20233-3700**

**CIR Staff Paper
No. 72**

March 1994

AN EPIDEMIOLOGICAL REVIEW OF
HIV/AIDS IN SUB-SAHARAN AFRICA

by
Peter O. Way
Karen A. Stanecki

Center for International Research
U.S. Bureau of the Census
Washington, D.C. 20233-3700

March 1994

SUMMARY

This report examines the distribution of HIV infection among various population groups in Sub-Saharan Africa and looks at trends over time in selected countries in the region. The report also looks at the likely current and future impact of AIDS on population growth and other demographic measures. Data presented in this report are taken from the *HIV/AIDS Surveillance Data Base*, developed and maintained at the U.S. Bureau of the Census.

As of mid-1993, the World Health Organization estimated that over 8 million adult infections had occurred in Africa. Of this total, about half to two-thirds were in east and central Africa, an area which accounts for only about one-sixth of the total population of Sub-Saharan Africa. Given the predominant role that heterosexual transmission plays in the HIV epidemic in Africa, it should be no surprise that commercial sex workers (CSWs) and their clients play a central role in this epidemic. In several countries, more than half of the CSWs tested were infected.

Patients attending sexually transmitted disease (STD) clinics can be considered a sample of the population with frequent casual sexual contacts. Patterns of increase in HIV infection among large samples of STD patients for several Sub-Saharan African countries have been seen. Quite rapid increases were noted recently in Tanzania, Kenya, Côte d'Ivoire and Ethiopia. Infection levels in the capital cities of these countries has reached over 20 percent for STD patients.

Samples of pregnant women are often used as surrogates for the general population. Since 1985, HIV seroprevalence studies of pregnant women have been conducted in a number of African countries. A variety of studies over the past 7 or more years in Uganda, Zambia, and Malawi show a consistent and rapid increase in HIV infection levels among pregnant women in the capital cities of these countries. Very recently, alarming increases in rates of HIV seroprevalence have been recorded in Botswana among this population group.

There is increasing evidence that women are more at risk of HIV infection per exposure. Available data from several African countries from the first round of sexual behavior surveys suggest that a differential in sexual behavior exists such that males are more likely to engage in casual sexual contacts than females. The result is that the overall sex ratio of HIV-infected population in Africa is not far from 1:1, although this ratio varies from country to country. Another factor of importance in the epidemic is age-mixing--the tendency for males to choose a younger female as a partner. This behavior results in HIV infection levels in younger women tending to be higher than males in the same age cohort, while older males tend to have higher infection levels than females of the same age.

Available data from Sub-Saharan Africa have tended to show a large differential in HIV infection levels between urban and rural areas of a country. Results from several studies indicate significant differences in infection levels between urban and rural areas. It is equally important to emphasize the geographic variation in current levels of HIV infection between countries.

Results from a mathematical model applied to Sub-Saharan Africa show a decrease in the population growth rate and an increase in the crude death rate. But since birth rates may be little affected by an epidemic, African countries should continue to have positive growth rates.

The area in which the population impacts of AIDS in Africa will occur most rapidly is in the survival of infants and children. Modelling results for urban areas in Sub-Saharan Africa suggest increases from about one-quarter to 50 percent in the infant mortality rate and a doubling in the total mortality under age 5 in the presence of a strong epidemic.

The best summary measure of a population's mortality experience is the life expectancy at birth. Because of the increases in both childhood and young adult ages, AIDS has a substantial impact on the life expectancy at birth.

AIDS is rapidly becoming a fact of life in Africa. Over the next decade, AIDS and its impact will become a fact of life for demographic and behavioral researchers working in Africa. Despite the medical and biological emphasis in much of AIDS research, AIDS is at its roots intrinsically bound to social and sexual patterns of behavior. Therefore, social and behavioral scientists have much to contribute to addressing the roots of this epidemic.

Preface

The Center for International Research conducts specialized studies of population, economics, labor force, health and aging issues. However, the use of data not generated by the U.S. Bureau of the Census precludes performing the same statistical reviews normally conducted on its own data.

This report was supported by funding from the U.S. Agency for International Development.

This report was prepared with the assistance of the staff of the Health Studies Branch including Jinkie Corbin, Anne Ryan, and Lisa Gist. Comments and questions regarding this study should be addressed to Karen A. Stanecki or Peter O. Way, Health Studies Branch, Center for International Research, U.S. Bureau of the Census, Washington, D.C. 20233-3700; telephone (301) 763-4086, FAX (301) 763-7610.

CONTENTS

SUMMARY	iii
PREFACE	v
INTRODUCTION	1
DATA SOURCES AND ISSUES	1
MODES OF TRANSMISSION IN SUB-SAHARAN AFRICA	2
TRENDS IN SELECTED POPULATION GROUPS	3
Commercial Sex Workers	3
STD Clinic Patients	4
Pregnant Women	5
Blood Donors	6
ISSUES	7
Age and Sex Patterns of Infection	7
Urban/Rural Differentials	8
Geographic Variation	8
DEMOGRAPHIC IMPACTS	10
Population Growth Rates/Crude Death Rates	10
Mortality Rates	11
Infant and Child Mortality	11
Life Expectancy at Birth	12
Age and Sex Structures	12

CONTENTS--Continued

EPIDEMIC GROWTH--HOW HIGH, HOW FAST? 13

WHAT THE FUTURE HOLDS 14

APPENDIX A 17

 References 22

APPENDIX B 31

BIBLIOGRAPHY 43

SOURCES FOR FIGURES 45

FIGURES

Figure

1. HIV Seroprevalence for Commercial Sex Workers in
Sub-Saharan Africa: Circa 1990 3

2. HIV Seroprevalence for STD Patients in Urban Areas of
Selected African Countries: 1982-92 4

3. HIV Seroprevalence for STD Patients by Sex in Selected
African Countries 5

4. HIV Seroprevalence for Pregnant Women in Selected
Urban Areas of Africa: 1985-1993 5

5. HIV Seroprevalence for Blood Donors by Age, Sex, and
Type of Donor Uganda: 1990 6

6. HIV Seroprevalence of Blood Donors Abidjan by Age and
Sex: 1991 7

7. HIV Seroprevalence for Rakai District by Age, Sex, and
Urban/Rural Residence: 1990 8

CONTENTS--Continued

8. African HIV-1 Seroprevalence for Low-Risk Urban Populations: Circa 1993 9

9. Illustrative Impact of HIV on Age-Specific Mortality Rates at Approximately 20% Adult Prevalence 11

10. Survivors per 100,000 Births at Approximately 20% Adult Prevalence 12

11. Illustrative Impact of HIV on Population at Approximately 20% Adult Prevalence 13

TABLE

1. Estimates of HIV-1 Seroprevalence, by Residence and Risk Factor, for Developing Countries: Circa 1993 19

MAPS

1. Seroprevalence of HIV-1 for Low-Risk Populations in East Africa 33

2. Seroprevalence of HIV-1 for Low-Risk Populations in Central Africa 35

3. Seroprevalence of HIV-1 for Low-Risk Populations in West Africa 37

4. Seroprevalence of HIV-2 for Low-Risk Populations in West Africa 39

5. Seroprevalence of HIV-1 for Low-Risk Populations in Southern Africa 41

As infection by the Human Immunodeficiency Virus (HIV) and the impact of the Acquired Immune Deficiency Syndrome (AIDS) spreads within population groups throughout Africa, it threatens to become the overriding demographic and social issue for Africa in the 1990's. In this review, we examine the distribution of HIV infection among various population groups in Sub-Saharan Africa and look at trends over time in selected countries in the region. We identify several areas of particular concern in terms of the regional spread of HIV infection and present available data to highlight the current understanding of those issues.

In addition, concern has been expressed regarding the potential impact of AIDS on population growth rates in the region and the accompanying motivation for the provision of family planning services. We discuss the likely current and future impact of AIDS on population growth and other demographic measures. As we will show, the impact of AIDS threatens the important gains in mortality in Africa won over the past several decades.

Finally, we discuss the demographic impact of an African AIDS epidemic based both on mathematical modelling of such an epidemic as well as on the patterns and trends already presented.

DATA SOURCES AND ISSUES

Our knowledge of the infection and spread of HIV and AIDS in Sub-Saharan Africa is based on a variety of reports and studies which are known to be incomplete and nonrepresentative. AIDS case reporting, for example, from African countries to the World Health Organization has been estimated to be about 10 percent complete due to a variety of factors, including inadequate reporting systems in country and particularly in the early years of the AIDS epidemic, a reluctance on the part of countries to report AIDS cases to an international organization. A knowledge of AIDS cases alone, moreover, is not sufficient for an understanding of the dynamics of the epidemic due to the extended incubation period between initial infection and later development of HIV-related illness. Thus, even the most accurate AIDS case data would only provide a picture of the epidemic of infection as it existed as many as 10 years ago.

As a result, there has been considerable attention paid to the collection of data on HIV infection among various population groups. In the early years of the epidemic, many of these studies were conducted in a nonscientific manner and may have provided results that were not representative even of the population group that was targeted by the study. More recently, increasing attention has been paid to such issues as increased sample sizes, representativeness of the sample selection, geographic coverage, and confirmatory testing of HIV positive results. Consequently, both the quantity and the quality of seroprevalence data

have improved markedly in recent years. Nevertheless, many biases still remain, and caution must be used in the interpretation of results.

Only a handful of nationally-representative seroprevalence surveys have been conducted in Sub-Saharan Africa, largely due to concerns regarding cost, diversion of skilled manpower, and an understanding that a nationally-representative sample may not provide much useful information about the groups at greatest risk for HIV infection. Thus, in recent years, sentinel surveillance programs have been developed to monitor defined populations for changes in HIV infection levels. For example, countries may develop programs that monitor infection among antenatal women attending government clinics, patients receiving treatment for sexually-transmitted diseases, and women engaged in commercial sex activities. Results from these studies can provide rapid feedback on infection levels and trends in populations at various levels of risk without the time and effort required to mount a national survey.

Data presented in the following discussion are taken from the *HIV/AIDS Surveillance Data Base*, developed and maintained at the U.S. Bureau of the Census, with funding support from the U.S. Agency for International Development. Data are regularly compiled from the scientific and technical literature as well as presentations at major international conferences. The *HIV/AIDS Surveillance Data Base* currently contains over 18,000 data records drawn from over 2,300 publications and presentations.

MODES OF TRANSMISSION IN SUB-SAHARAN AFRICA

The World Health Organization (WHO) Global Programme on AIDS (Mann and Chin, 1988) has developed a typology to describe the various patterns of infection and spread of AIDS around the world. Within this typology, Africa is characterized as a Pattern II region, with a predominance of heterosexual transmission and substantial vertical (mother to child) transmission. As of mid-1993, WHO estimated that over 8 million adult infections had occurred in Africa. Of this total, about half to two-thirds were in east and central Africa, an area which accounts for only about one-sixth of the total population of Sub-Saharan Africa (WHO, 1993). Infected blood is thought to account for only about 10 percent of all HIV infections. Homosexual transmission and transmission through intravenous drug use are generally considered to have minimal impact on the epidemic in Sub-Saharan Africa.

TRENDS IN SELECTED POPULATION GROUPS

The following discussion focuses on four groups at varying levels of risk for HIV infection, namely, commercial sex workers, patients at sexually-transmitted disease (STD) clinics, pregnant women, and blood donors. The purpose is to describe the HIV/AIDS epidemic in Africa as it has been documented in these groups. This categorization is based on a desire to track infection patterns in populations at elevated risk of infection (prostitutes and STD patients), as well as to describe infection in samples which may be more representative of the general population (pregnant women and blood donors). Due to the lack of large numbers of surveys of the general population, this description is also determined by data availability issues.

Commercial Sex Workers

Given the predominant role that heterosexual transmission plays in the HIV epidemic in Africa, it should be no surprise that prostitutes and their clients play a central role in this epidemic (Padian, 1988). As Larson (1989) has described, the organization of the commercial sex industry and the availability of casual sex partners can play a key role in the spread of HIV infection in a country. Modelers in the field of sexually-transmitted diseases have documented the importance of "core groups" in the spread of infection (Hethcote and Yorke, 1984). Prostitutes, because of the number of sexual partners, are in many countries the group most at risk for HIV infection. Unfortunately, in many African cities, this risk has resulted in infection levels approaching 50 percent. In some, and especially among low SES prostitutes (who tend to have more clients), infection has become nearly universal.

Data are available on HIV infection among samples of urban prostitutes in the *HIV/AIDS Surveillance Data Base* for 21 countries in Sub-Saharan Africa (Figure 1). In 11 of these 21 countries, the most recent data show infection levels over 30 percent. In several countries more than half of the women are infected. As we will see with data from other population groups, infection levels in many countries are increasing. For example, in Abidjan, Côte d'Ivoire, seroprevalence among commercial sex workers rose from 69 percent in 1990

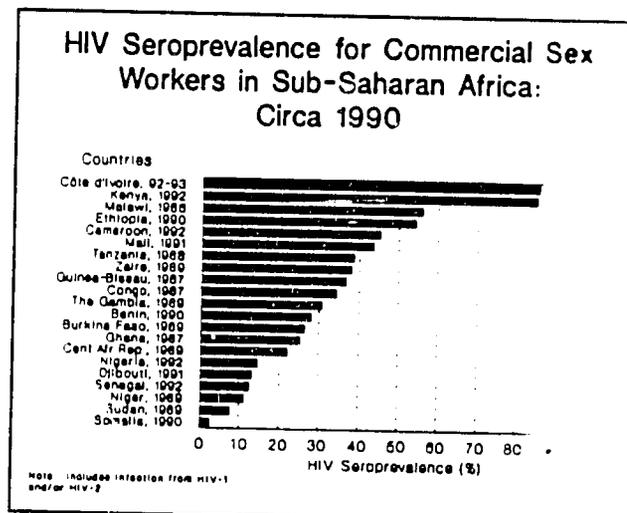


Figure 1

to 86 percent in 1992-93.¹ Although data on commercial sex workers are not available for all countries, based on these 21 it could be safely said that infection levels in this population group are much higher than in the general population.

STD Clinic Patients

Knowledge of levels of HIV infection among the population with frequent casual sexual contacts is high priority. But the selection of such a sample is understandably problematic. However, patients attending STD clinics can be considered a sample of that population since they or their partners are likely to have had sexual contact with others. They are at elevated risk both due to the presence of multiple partners, as well as due to the potentially enhanced risk of HIV infection among those with various other STDs (see Wasserheit, 1990). For example, various studies have estimated those with a recent STD to be at several times higher risk for HIV infection than those with no such exposure.

Several factors, on the other hand, may result in the data on HIV infection among STD patients not being representative of the total population with casual sex behavior. Among these are biases in the propensity to seek treatment at public facilities and variation (e.g., by sex) in the presence of symptomatic infections, etc. Nevertheless, such studies provide valuable information on a potentially large population at high risk of HIV infection at a time when surveys of AIDS Knowledge, Attitudes, Behaviors and Practices (KABP) are beginning to shed some light on sexual contacts outside of marital partnerships (see Carael, Carballo, et al., 1991).

Patterns of increase in HIV infection among large samples of STD patients for several Sub-Saharan African countries are shown in Figure 2. Quite rapid increases are noted recently in Tanzania, Kenya, Côte d'Ivoire, and Ethiopia. Infection levels in the capital cities of these countries has reached over 20 percent for STD patients. Although both Gabon and South Africa (results for black females) show relatively low levels of infection, the increases noted in the most recent data are ominous. In contrast with these

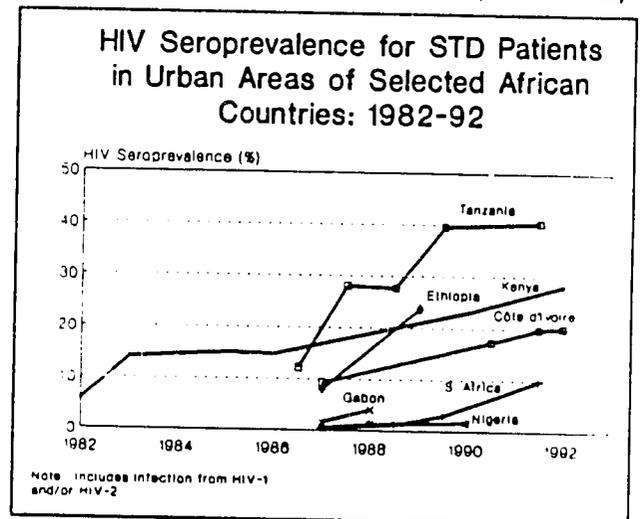


Figure 2

¹ Source references for the figures are contained in a separate listing following the bibliography.

other countries, Nigeria has documented only a slow increase in infection among this population group.

Studies of STD patients in several other countries have documented HIV infection levels over 50 percent (Figure 3). Patterns of sex differentials in HIV infection are consistent. In all of these cases, females have higher HIV infection levels than males. The stage of the epidemic or patterns of treatment in public facilities may contribute to these observations.

Pregnant Women

Samples of pregnant women are often used as surrogates for the general population. This is convenient, since in many countries women attend government clinics to receive antenatal care. To some extent, pregnant women can be considered to be at somewhat higher risk than the general population since they are sexually active. On the other hand, they also are drawn from a limited age range, may be biased toward those in marital (formal or informal) unions, and tend to be younger than adult women in general, given typical age-specific fertility rate patterns. Nevertheless, for many countries, data on pregnant women provides the most representative picture of HIV infection in the general population.

Since 1985, HIV seroprevalence studies of pregnant women have been conducted in a number of African countries. Seroprevalence data from those studies provide an initially confusing picture of regional trends (Figure 4). A variety of studies over the past 7 or more years in Uganda, Zambia, and Malawi show a consistent and rapid increase in HIV infection levels among pregnant women in the capital cities of these countries. By 1990, more than 20 percent of the samples of pregnant women in those areas were infected, while in 1986 infection levels in both Lusaka and

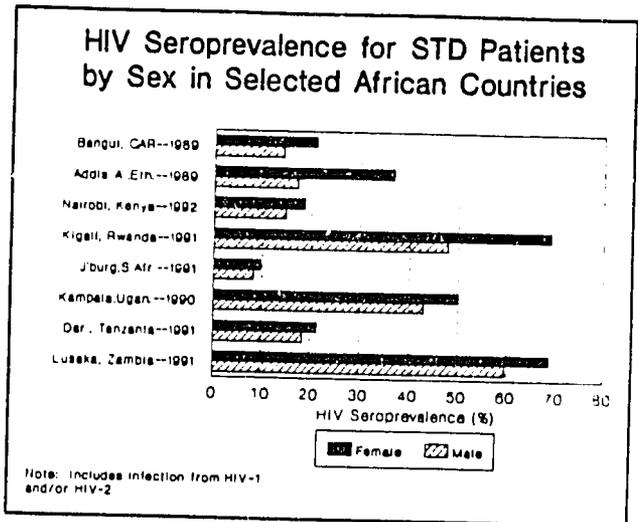


Figure 3

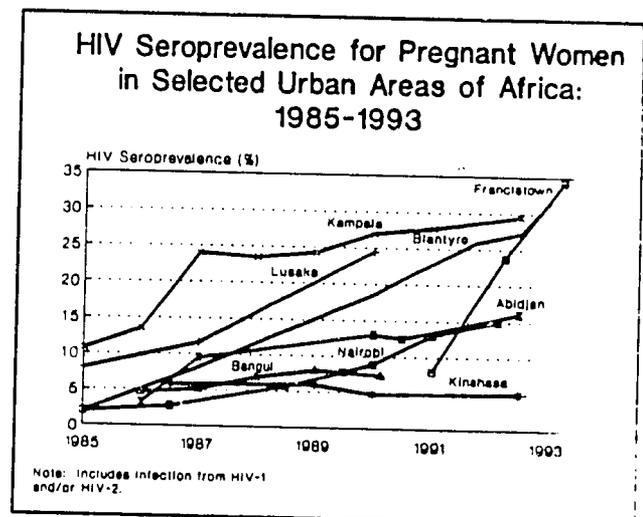


Figure 4

Lilongwe were well below 10 percent. Kigali, Rwanda (not shown in Figure 4), with a reported infection rate of over 30 percent in 1989, is another major urban area with high levels of infection.

In contrast, pregnant women in Nairobi and Bangui have shown quite moderate increases in comparison, and infection levels in Kinshasa have been relatively stable at around 5-6 percent. Infection levels for pregnant women in Abidjan increased rapidly to around 10 percent by 1987, appeared to have plateaued by 1990, but have started increasing again. Alarming increases in rates of HIV seroprevalence have been recorded in Botswana. In Francistown, HIV seroprevalence increased from less than 10 percent in 1991 to over 30 percent in 1993. (Issues of possible upper level to the epidemic and rates of increase are discussed further below.)

Blood Donors

HIV seroprevalence data from blood banks, for many countries, represents a readily-accessible sample for use in monitoring changes in HIV infection in the population. However, comparisons with general-population samples in several areas raise questions regarding the representativeness of the blood donor samples (Torrey, Mulligan, and Way, 1990). Donors tend to be predominantly male and in their young adult ages. In addition, female donors appear to be a higher-risk group than the general population or male donors. Screening and self-selection processes may act to further bias the sample. An example of such processes can be seen in data from blood donors in Uganda (Figure 5). Female volunteer donors are about twice as likely to be HIV positive as their male volunteer counterparts, while family donors, perhaps more representative of the population, are more evenly balanced. Studies in Zaire and other countries have confirmed this tendency for family donors to be more infected than volunteers.

Obviously, issues related to the quality of the blood supply influence decisions regarding the monitoring of blood donors. But, from the available data to date, it does not appear that this group represents a valid proxy for the general population.

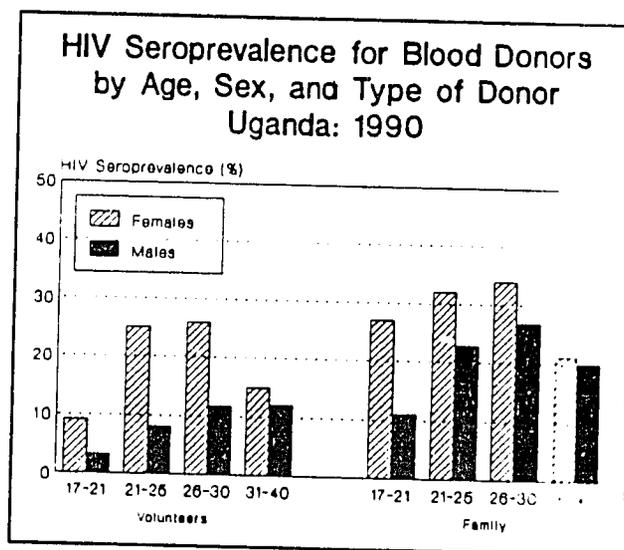


Figure 5

ISSUES

Age and Sex Patterns of Infection

Although the precise values are not yet known, there is increasing evidence that women are more at risk of HIV infection when considered either on a *per contact* or *per partnership* basis. In this respect, HIV is no different from other STDs where a similar relation exists. On the population level, however, the risk of HIV infection for women will be a result of the sexual behavior of those women and (secondarily) the behavior of their sexual partners. Available data from several African countries in the latest round of sexual behavior surveys suggests that a differential in sexual behavior exists such that males are more likely to engage in casual sexual contacts than females. This will tend to counterbalance the female's biologically higher susceptibility to infection. The result is that, as the WHO has suggested, the overall sex ratio of HIV-infected population in Africa is not far from 1:1.

This does not mean that in every African country one can expect equal levels of infection, as the timing of the epidemic and sexual behavior patterns will differ. Several serosurveys in Uganda, for example, yield sex ratios for infected respondents of 1:1.4 (Berkley, et al., 1990). In Côte d'Ivoire, on the other hand, nationally-representative rural seroprevalence levels applied to the population, by age and sex, imply nearly 2 infected males per infected female in the rural area.

Another factor of importance is age-mixing--the tendency for males to choose a **younger** female as a spouse (as well as a casual sexual partner). This behavior results in HIV infection levels in younger women tending to be higher than males in the same age cohort, while older males tend to have higher infection levels than females of the same age. This pattern is shown in Figure 6 for Côte d'Ivoire and in Figure 7 for Uganda.

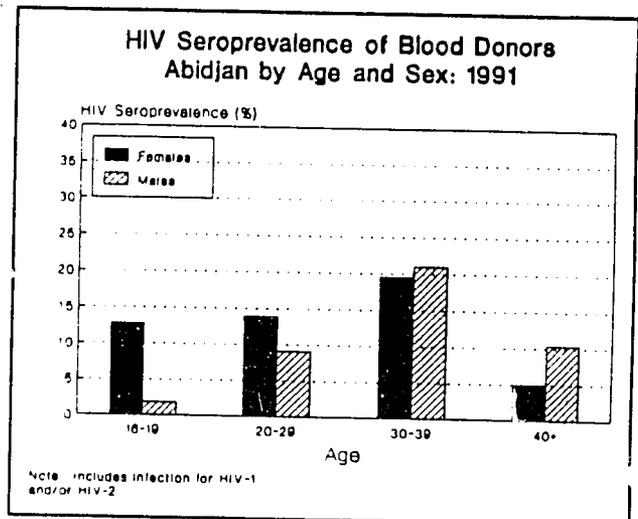


Figure 6

Urban/Rural Differentials

Available data from Sub-Saharan Africa have tended to show a large differential in HIV infection levels between urban and rural areas of a country. A representative population survey in Rwanda in 1987, for example, found 17 percent of the adult population in Kigali to be infected, while only 2.1 percent of the rural population sampled were HIV positive. Data from the Rakai District in Uganda demonstrate both the typical age pattern of infection and urban/rural differentiation in infection levels (Figure 7).

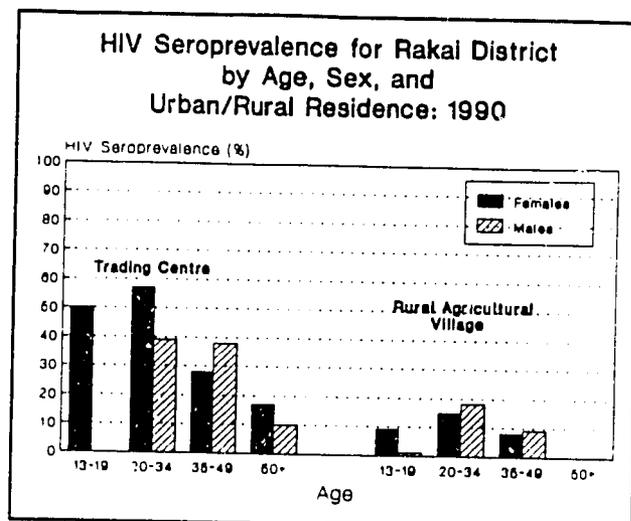


Figure 7

Such patterns are likely to result from differences in the timing of the introduction of HIV into the population and perhaps differences in patterns of sexual behavior between urban and rural populations. However, many exceptions to this generalization can be identified. For example, the Rakai district in rural Uganda has recorded HIV infection levels that equal those in Kampala, while, on balance, rural infection levels are about one-half of the urban infection levels. Across the border in Tanzania, the Bukoba district has a higher HIV seroprevalence than Dar Es Salaam. However, within the Bukoba district, urban areas exhibited higher rates of infection than did rural areas (24 percent vs. 5 percent, respectively). The availability of adequate transportation routes to and through rural areas and the level of rural/urban migration both contribute to the speed of the spread of HIV infection to these areas. Thus, countries with well-developed transportation infrastructures and high levels of rural/urban migration may experience rapid spread of HIV infection to rural areas.

Geographic Variation

Results from seroprevalence surveys presented above have tended to highlight the trends in particular population groups and focus on the differentials among populations at different levels of risk. It is equally important to emphasize the geographic variation in current levels of HIV infection between countries, based on

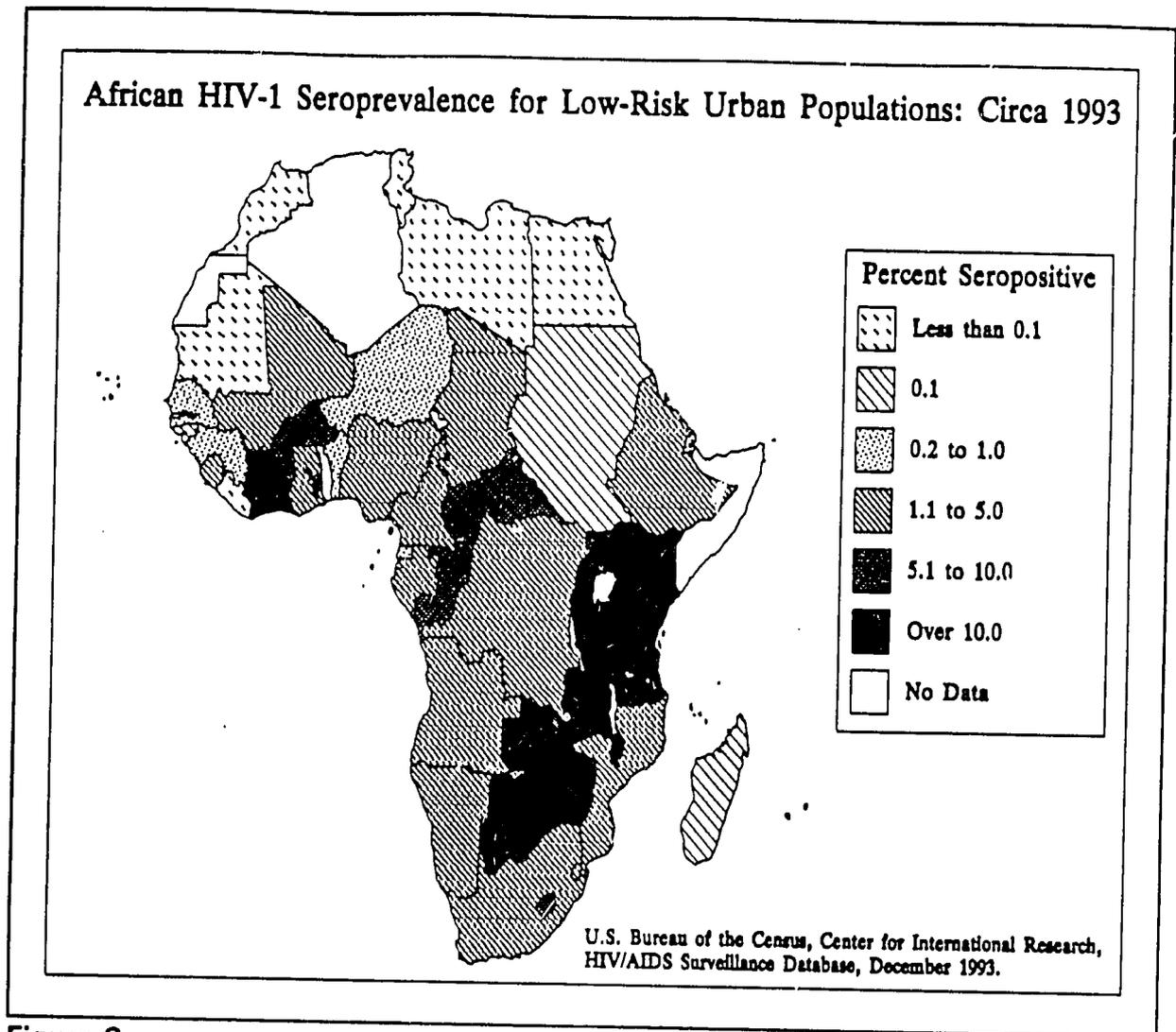


Figure 8

a comparison of "low-risk" urban population groups. Figure 8 shows the most recent available data by county for Africa.² Factors that can be shown or hypothesized to contribute to the observed variation include the timing of the introduction of the HIV virus to the population, marriage practices and sexual behavior before and outside of marriage, prevalence of STDs in the population, and male circumcision practices. This geographic pattern will be changing over time, as HIV infection levels continue to increase in some countries, while others experience some plateauing of infection. (See Appendix B for regional maps of HIV-1 and HIV-2 for low-risk populations.)

² Data, in tabular form, for high and low risk population groups in urban areas and outside of urban areas are provided in Appendix A.

DEMOGRAPHIC IMPACTS

Results in this section are based primarily on the Center for International Research's work with the iwgAIDS model, a collaborative research and development project sponsored by the U.S. Department of State (Stanley, Seitz, Way, et al., 1991). This model, although still undergoing change, has been applied to the population of Uganda (by the Future's Group under the AIDSTECH project) and Sub-Saharan Africa (Way and Stanecki, 1991), and has more recently been used in policy dialogue with the government of Thailand.

Population Growth Rates/Crude Death Rates

Africa's current high rate of population growth (about 3 percent per year) will help to protect African countries from experiencing negative population growth as a result of the AIDS epidemic. Results from the iwgAIDS model applied to Sub-Saharan Africa showed a decrease in the growth rate by about 0.5 percentage points resulting from an epidemic infecting about 8 percent of the total population. This decrease in growth rate was the result of an increase in the future crude death rate from an expected 10 per 1000 population to 15 per 1000 population. Urban infection levels, which had reached 16 percent of the total population (with peak rates of around 30 percent in some age groups) resulted in a doubling of the crude death rate and a reduction of the population growth rate by about 1 percentage point.

Thus, even with a relatively severe AIDS epidemic (e.g., 25 percent of sexually active adults infected) reaching into both urban and rural areas of the country, total population growth rates may decrease by only about 1 percentage point, corresponding to an increase of about 10 per 1000 in the crude death rate. Since modeling results show that birth rates may be little affected by an epidemic, African countries should continue to have strong positive growth rates, despite the presence of an AIDS epidemic. In other regions of the world, on the other hand, such infection levels would have a real potential to result in declining populations, due to the lower initial rates of population growth.

Other models have demonstrated the potential for negative population growth in African countries (e.g., Anderson, May, and McLean, 1988; Potts, Anderson, Boily, 1991). Such an effect was demonstrated, however, only when general adult population seroprevalence levels reached levels exceeding even those of STD patients in urban Africa today (e.g., 50-60 percent). As yet, we have no indication that the sexual behavior and transmission parameters within Africa would lead to such prevalence levels in urban populations, much less throughout both urban and rural areas.

Mortality Rates

Studies based both on models and on empirical information have identified the most important aspects of the impact of HIV infection and an AIDS epidemic on a population. New HIV infections among adults are concentrated in the ages of peak sexual activity--from the late teens to about age 30 or 35. Because of the 7 to 10 year average incubation period between infection and the onset of AIDS, and about a 1-year survival period after acquiring AIDS, deaths from AIDS are shifted into older ages and tend to occur most often in the 30 to 45 year age range. These ages are characterized by non-AIDS mortality rates for most causes of deaths that are among the lowest of all age groups. Thus, AIDS can increase the mortality rates in these age groups many times over (Figure 9).

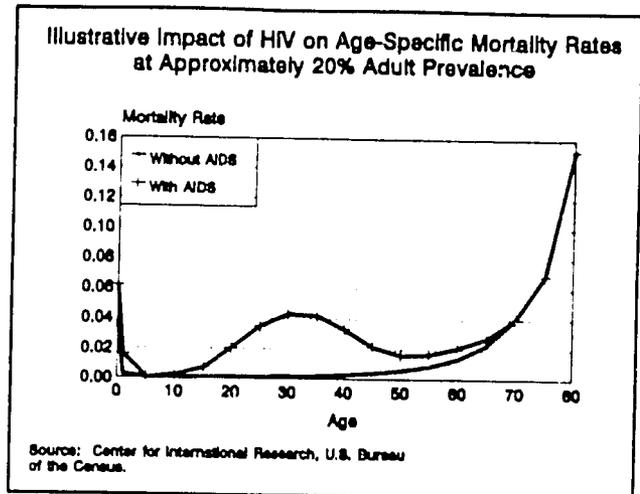


Figure 9

Infant and Child Mortality

The area in which the population impacts of AIDS in Africa will occur most rapidly is in the survival of infants and children, given the predominant transmission modes and since studies have shown the progression to AIDS and death more rapid for those under 5 years of age. Although perhaps only one-third of those born to HIV-infected mothers are themselves infected, the more rapid progression means that HIV-related infant and child deaths will often occur before the deaths of their parents.

Although the attribution of HIV-related deaths to the infant (under 1 year) or child (1-4 years) period is somewhat problematic due to the lack of a sufficient number of cohort studies, it appears clear that virtually none of the infected infants will survive past their 5th birthday. Due to the survival of HIV-infected infants past their 1st birthday, however, child mortality levels may be more affected than infant mortality.

Modeling results for urban areas in Sub-Saharan Africa suggest increases from about one-quarter to 50 percent in the infant mortality rate, and a doubling in the total mortality under age 5 in the presence of a strong epidemic (U.S. Bureau of the Census, forthcoming). Other analysis, using recent seroprevalence data for pregnant women, found that in African urban areas with high HIV seroprevalence levels, between one-tenth and one-third of all deaths under age 5 already may be attributable to HIV infection (Valleroy, Harris, and Way, 1990, p. 670).

Life Expectancy at Birth

The best summary measure of a population's mortality experience is the life expectancy at birth, because it represents an accumulation of mortality across all ages and captures the differential impact of a death at various ages. Because of the increases in both childhood and young adult ages, AIDS has a substantial impact on the life expectancy at birth. As a result of AIDS, substantial increases in mortality rates occur in the adult ages, where relatively few deaths are typically expected. The cumulative effect of this increased mortality is substantial.

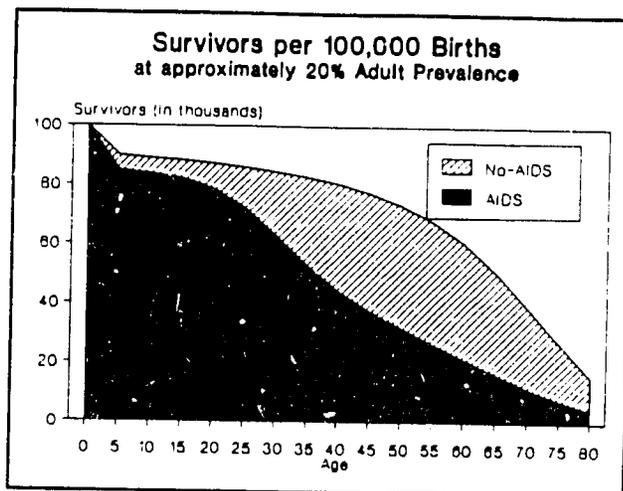


Figure 10

Once again using modeling results, the effect of AIDS on cumulative survival after birth can be shown (Figure 10). In this severe urban epidemic, the survival to age 50 is less than 50 percent the survival expected without AIDS. The net effect of this AIDS epidemic is to reduce urban life expectancy at birth 17 years, or approximately 1 year decrease in life expectancy for each percentage-point increase in HIV prevalence levels in the population.

Age and Sex Structures

How different will future age and sex structures be because of AIDS? AIDS has relatively little direct effect on fertility rates, due to the delay between HIV infection and AIDS mortality. Similarly, an AIDS epidemic has only a slight effect on the population dependency ratio because AIDS mortality occurs both in the numerator and the denominator of that measure. Thus, although AIDS mortality occurs primarily in the childhood and middle adult years, it is perhaps less concentrated in particular ages than, for example, the effects of military deaths during war.

The absolute size of each age cohort is shown in the population pyramid (Figure 11), reflecting differences in both the number of AIDS deaths and the reduced population growth. The greatest relative differences in population size by cohort are evident in the youngest age groups and in those 30 to 50 years of age.

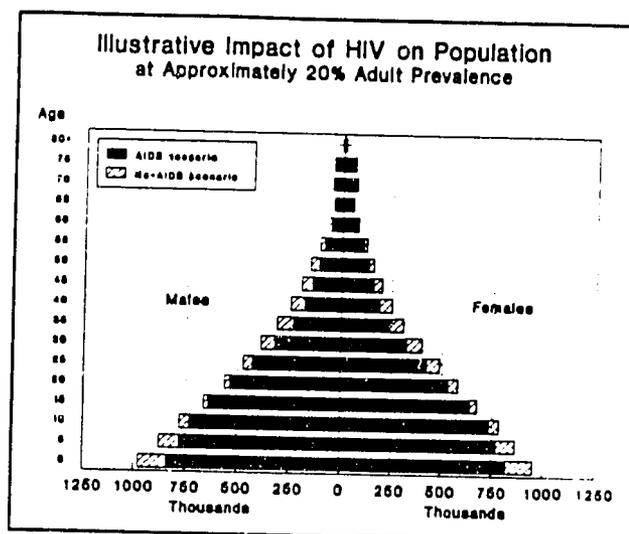


Figure 11

EPIDEMIC GROWTH--HOW HIGH, HOW FAST?

Given the variation in observed levels of infection and epidemic growth rates described above, a series of questions relating to the epidemic naturally follow. How rapidly will HIV continue to spread in the future? At what point in current high-prevalence countries will HIV infection become endemic, that is, stabilize? Will countries with currently low levels of infection inevitably progress to HIV prevalence levels currently recorded e.g., in Kampala or Kigali, or is a plateauing at a lower level possible?

Although crystal ball technology continues to lag, valuable insights can be obtained from the available seroprevalence data as well as results of mathematical modeling, described more below. These data suggest the following tentative responses to the above questions:

- Variation in the speed of increase in HIV infection and in the endemic level of infection will result from variations in sexual behavior, presence of STDs and other cofactors, and perhaps other unknown factors.
- Although by no means definitive, available studies have not found infection levels in general population or antenatal women samples above around 30 percent. This raises the question of how much above this level can HIV infection in the general population be supported. However, several high prevalence sites appear to be still increasing. Studies conducted over the next several years in high-

infection areas may help to shed light on possible upper limits to infection levels in the general population.

- Results from several settings have shown relatively stable and moderate levels of infection in some general population samples over a period of several years, for example, in Kinshasa. Thus, there appears to be hope that not all countries will follow the path toward high infection levels.
- Infection levels in rural populations will generally lag behind urban prevalence levels and may plateau at lower levels.

WHAT THE FUTURE HOLDS

The patterns and trends presented above allow some extrapolation to the future, however tentative, based on the brief documented history of HIV/AIDS in Africa and borrowing from the experience of those countries most affected in the region. This extrapolation provides the following glimpses of the future:

- HIV infection and the impact of AIDS will continue to increase in most African countries in the near future. Infection will spread into rural areas for which little information currently exists.
- The population will continue to be exposed to varying degrees of risk, depending on their behavior and that of their sexual partner. Differentials in HIV infection levels will persist, reflecting the variation in risk.
- AIDS will have an increasing impact on the African population, primarily through increased mortality in the population under age 5 and between 30 and 50 years of age. In many countries, gains in infant and child survival and in life expectancy, hard-won over the past several decades, will be reversed.
- Unfortunately, due to the weak systems for demographic data collection and reliance on indirect measures of mortality, the documentation of much of this impact will be handicapped by delays in data collection and the inability of current methods to provide precise dating of events. Current measures of adult mortality in Africa are particularly weak and subject to these limitations.
- Efforts to implement interventions to limit the spread of HIV will challenge behavioral scientists working in the region both in terms of measuring relevant behaviors as well as identifying their determinants.

- The need to evaluate interventions will further challenge researchers to identify relevant proximate and intermediate outcome measures, estimate these measures with accuracy and efficiency, and provide adequate linkages to program interventions to demonstrate program efficacy to donor agencies.

AIDS is rapidly becoming a fact of life in Africa. Over the next decade AIDS and its impact will become a fact of life for demographic and behavioral researchers working in Africa, if it has not already. Despite the medical and biological emphasis in much of AIDS research, AIDS is, at its roots, intrinsically bound to social and sexual patterns of behavior. Therefore, social and behavioral scientists have much to contribute to addressing the roots of this epidemic.

APPENDIX A

Table 1: Estimates of HIV-1 Seroprevalence, by Residence and Risk Factor, for Developing Countries: Circa 1993

REGION AND COUNTRY	CAPITAL/MAJOR CITY		OUTSIDE MAJOR CITY		URBAN CITY SOURCES		OUTSIDE CITY SOURCES	
	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK
AFRICA								
Algeria	-	-	-	-				
*Angola	1.7	14.2a	-	-				
*Benin	.6	25.3a,b	-	-	P0103	S0043		
Botswana	22.5c	31.9c	.4	-	D0114	B0132	D0114	
*Burkina Faso	8.8a	17.2a	7.5	-	N0097	N0097	N0087	
			4.1a	44.7a,b	S0145	L0086	O0029	B0092
Burundi	19.9	-	1.6	-	B0174		B0174	
*Cameroon	1.6c	45.3	2.9	-	G0112	M0272	S0195	
*Cape Verde	.0	-	.0	-	A0046		A0046	
Central African Rep.	7.4	16.5	8.5	22.0	W0069	W0069	W0069	W0069
Chad	4.1	-	-	-	M0266			
Comoros	-	0.1	-	-		P0059		
Congo	9.0	17.5c	2.6	-	B0127	G0073	B0162	
*Cote d'Ivoire	14.8a	86.0a	3.3a	-	D0112	T0085	B0108	
*Djibouti	.3	43.0	.0b	-	B0037	C0141	F0017	
Egypt	.0	.2	-	-	H0086	C0101		
*Equatorial Guinea	.3	-	-	-	J0009			
Ethiopia	2.1	54.2	.0	65.6	H0046	N0083	Z0009	N0083
*Gabon	2.5	3.6a	-	3.7	M0146	M0146		S0152
*Gambia, The	.1	4.6a	-	-	W0027	P0062		
*Ghana	2.2	37.5b	-	-	M0143	D0096		
*Guinea	.6a	.6	.3	-	K0074	L0074	J0028	
*Guinea-Bissau	.1	.0b	.5a	-	A0042	K0033	R0059	
Kenya	15.0b	85.5	6.3b	-	G0105	M0243	M0251	
Lesotho	5.5b	5.8b	0.5b	0.6b	M0267	M0267	M0267	M0267
Liberia	.0	.0b	-	-	F0007	M0060		
Libya	.0	-	-	-	G0091			
*Madagascar	0.1	0.1	-	-	K0076	K0076		
Malawi	31.6	55.9	-	-	O3703	G0005		
*Mali	3.7	42.6a	-	-	M0247	K0116		
*Mauritania	.0b	-	-	-	C0093			
Mauritius	.0	0.8	-	-	K0026	P0074		
Mayotte	-	-	-	-				
*Morocco	.0	7.1b	-	-	Z0022	R0046		
*Mozambique	1.1	1.2a	.8	3.7a	D0020	V0053	B0025	F0050
*Namibia	2.5	-	-	-	L0040			
*Niger	.6a	5.9a	-	-	O0044	O0044		
*Nigeria	1.2a,c	12.3a,c	-	-	A0101	D0120		
Reunion	-	-	-	-				
Rwanda	33.4	69.0b	9.8	-	L0119	K0127	C0132	
St. Helena	-	-	-	-				
*Sao Tome & Principe	.0	-	-	-	L0022			
*Senegal	.3a	3.9a	0.2b	2.0b	D0113	D0105	W0071	W0071
Seychelles	-	-	-	-				
*Sierra Leone	3.5a	27.5b	-	-	K0060	M0237		
Somalia	-	2.4	-	-		C0122		
South Africa	1.7	8.2	-	-	R0089	R0065		
Sudan	.1	16.0b	-	-	A0071	M0134		
Swaziland	2.3b	2.2b	-	-	W0060	W0060		
*Tanzania	11.5	42.9	10.2b	34.3b	K0125	M0256	R0090	R0090
Togo	-	-	-	-				
*Tunisia	0.0	1.9	-	-	B0169	G0015		
Uganda	29.5	45.0	5.0	86.0b	A0066	G0095	K0155	N0003
Western Sahara	-	-	-	-				
Zaire	5.0c	38.0	2.9	25.4	M0265	M0265	M0265	G0092
Zambia	24.5b	54.0b	16.0b	36.0b	T0040	T0040	K0096	K0096
Zimbabwe	18.0	28.6b	12.8	34.4	M0241	H0061	W0061	W0061

Table 1: Estimates of HIV-1 Seroprevalence, by Residence and Risk Factor, for Developing Countries: Circa 1993

REGION AND COUNTRY	CAPITAL/MAJOR CITY		OUTSIDE MAJOR CITY		URBAN CITY SOURCES		OUTSIDE CITY SOURCES	
	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK
ASIA AND OCEANIA								
Bahrain	-	.0	-	-		F0038		
Bangladesh	.0	-	-	-	W0076			
Bhutan	.0	-	-	-	W0076			
Burma	2.2	11.4	0.1	15.5	F0055	F0055	F0055	F0055
China, People's Republic of	-	14.2	-	-		Z0036		
French Polynesia	.0	.0	-	-	A0047	C0005		
Hong Kong	.0	.0	-	-	L0097	W0078		
*India	.8a	26.6	-	-	J0022	B0144		
Indonesia	.0	-	-	-	W0076			
Israel	.0	1.1	-	-	M0204	M0186		
Japan	.0	.1	-	-	S0161	S0161		
Korea, Dem. People's Rep.	.0	-	-	-	W0076			
Korea, Rep.	.0	.1	-	-	M0274	Y0013		
Kuwait	.0	.0	-	-	B0078	M0101		
Laos	.1	-	-	-	K0007			
Macau	.0	-	-	-	V0017			
Malaysia	.0	29.5	-	-	B0082	S0215		
Maldives	.0	-	-	-	W0076			
Mongolia	.0	-	-	-	W0076			
Nepal	0.1	1.6	-	-	W0076	P0096		
New Caledonia	.0	.0	.0	-	C0089	C0089	C0089	
Pakistan	.0	-	-	-	M0228			
Papua New Guinea	.0	.7	-	-	V0017	V0017		
Philippines	.0	.1	-	.1	D0033	D0033		H0025
Saudi Arabia	.0	-	-	-	B0137			
Singapore	.0	0.4	-	-	V0017	C0138		
Sri Lanka	.0	0.1b	-	-	W0076	A0105		
Syria	.0	-	-	-	M0139			
*Taiwan	.0	.4	-	-	C0131	H0092		
Thailand	1.9	35.9	-	-	T0100	T0100		
Turkey	.0	1.6	-	-	R0044	B0088		
Vietnam	.0	0.1	-	-	V0044	F0059		
LATIN AMERICA/CARIBBEAN								
Antigua & Barbuda	-	1.7	-	-		G0123		
Argentina	.3	6.3	.2	2.0	F0024	Z0030	F0037	F0037
Bahamas, The	3.6	18.4	-	-	B0179	B0179		
Barbados	1.2c	4.7	-	-	B0186	G0123		
					B0187			
					B0188			
					B0189			
Bolivia	.0	.0	-	-	M0078	M0078		
*Brazil	0.8	24.0a	0.3	.0b	M0275	F0047	C0152	T0046
British Virgin Islands	2.8b	-	-	-	B0206			
Cayman Islands	0.0	-	-	-	G0123			
Chile	0.0	1.0	-	-	L0123	L0123		
Colombia	.1	14.6	-	-	B0027	B0043		
Costa Rica	1.1c	4.3c	-	-	L0125	L0128		
*Cuba	.0	.0	-	-	M0287	M0297		
Dominican Rep.	1.3	5.0	-	-	G0106	G0100		
Ecuador	.0b	0.5	-	-	R0093	R0093		
El Salvador	0.3b	2.2	-	-	M0235	E0036		
Grenada	0.0	2.4b	-	-	G0140	G0139		
Guatemala	.0	.7	-	-	M0205	T0065		
Guyana	6.9	25.0b	-	-	G0137	G0123		

December, 1993

U.S. BUREAU OF THE CENSUS -- HIV/AIDS SURVEILLANCE DATA BASE

Table 1: Estimates of HIV-1 Seroprevalence, by Residence and Risk Factor, for Developing Countries: Circa 1993

REGION AND COUNTRY	CAPITAL/MAJOR CITY		OUTSIDE MAJOR CITY		URBAN CITY SOURCES		OUTSIDE CITY SOURCES	
	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK	LOW RISK	HIGH RISK
LATIN AMERICA/CARIBBEAN CONT'D								
Haiti	15.7	41.9	4.0	-	B0138	G0U48	A0097	
Honduras	.2	19.8	-	-	M0242	Z0035		
Jamaica	.3	14.6b	-	-	J0034	W0036		
Martinique	.5	38.9b	-	-	C0067	C0033		
Mexico	.1b	2.2	-	-	H0083	U0005		
Monsterrat	0.0c	-	-	-	M0278			
					M0279			
					M0280			
Nicaragua	.0	1.6b	-	-	N0110	N0110		
Panama	.0	-	-	-	P0018			
Paraguay	.0	.1	-	-	V0058	C0112		
Peru	.1	.3	-	-	A0014	A0014		
St. Kitts & Nevis	2.0c	-	-	-	S0227			
					S0241			
					S0242			
St. Lucia	0.0c	1.2c	-	-	S0218	S0217		
					S0220	S0218		
					S0221	S0220		
					S0221	S0221		
St. Vincent & Grenadines	0.2	1.4c	-	-	S0235	S0234		
						S0235		
						S0236		
Suriname	.8c	2.6	-	-	S0244	S0246		
					S0245			
Trinidad & Tobago	.2c	14.7	-	-	T0091	C0143		
					T0092			
					T0093			
					T0095			
Uruguay	0.1	5.6	-	-	A0118	S0209		
Venezuela	.1	6.1b	.0	-	E0024	E0024	A0022	

- No data found

* See table 2 for HIV-2 data

a Rate represents infection with HIV1 only and dual infection (HIV1 & HIV2), therefore addition of rates from table 1 and 2 is not advised.

b Data are best available but are not necessarily reliable due to small sample size (<100).

c Data combined.

NOTES:

Definition: High risk--prostitutes and clients, STD patients, or other persons with known risk factors
 Low risk--pregnant women, blood donors, or other persons with no known risk factors.

SOURCE: U.S. Bureau of the Census, HIV/AIDS Surveillance Data Base, 12/93 Update

REFERENCES

- 03703 U.S. Department of State, 1993, AIDS/HIV in Malawi - A Status Report, Unclassified cable, 8/93, Lilongwe 03703.
- A0014 Agüero, G., F. S. Wignall, W. Alexander, et al., 1988, HIV Infections in Peru, IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5078.
- A0022 Azocar, J., C. Martinez, M. F. McLane, et al., 1987, Lack of Endemic HIV Infection in Venezuela, AIDS Research and Human Retroviruses, vol. 3, no. 2, pp. 107-108.
- A0042 Andreasson, P. A., F. Dias, J. M. Teixeira Goudiaby, et al., 1989, HIV-2 Infection in Prenatal Women and Vertical Transmission of HIV-2 in Guinea-Bissau, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 052.
- A0046 Andrade, D., L. Leite, S. Theobald, et al., 1989, Taux de Seroprevalence des Anticorps Anti-HIV dans les îles du Cap Vert: Etude par Sondage en Grappe, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Abstract 047.
- A0047 Alandry, G., A. Leguelle, F. F. Sainte-Marie, 1989, HIV Infection in French Polynesia, Medecine Tropicale, vol. 49, no. 1, pp. 71-72.
- A0071 Ahemd, S. M., E. H. H. M. Kheir, 1990, Sudanese Sexual Behaviour in the Context of Socio-Cultural Norms and the Transmission of HIV, Anthropological Studies Relevant to the Sexual Transmission of HIV, Sonderborg, Denmark, 11/19-22.
- A0086 Asimwe, G., G. Tembo, W. Naamara, et al., 1992, AIDS Surveillance Report: June 1992, Ministry of Health, AIDS Control Programme Surveillance Unit, Entebbe, Uganda, unpublished report.
- A0097 Allain, J. P., W. Hodges, M. H. Einstein, et al., 1992, Antibody to HIV-1, HTLV-1, and HCV in Three Populations of Rural Haitians, Journal of Acquired Immune Deficiency Syndromes, vol. 5, no. 12, pp. 1230-1236.
- A0101 Asagba, A. O., J. J. Andy, T. Ayele, et al., 1992, HIV Sentinel Surveillance in Nigeria, Nigeria Bulletin of Epidemiology, vol. 2, no. 2, pp. 10-13.
- A0105 Abeyewickreme, I., 1993, Sexually Transmitted Diseases and HIV in Sri Lanka - 7 Year Review, IX International Conference on AIDS, Berlin, 6/6-11, Abstract PO-C10-2808.
- A0118 Arago, Decaro, Russi, et al., 1992, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- B0025 Barreto, J., L. Ingold, F. De La Cruz, et al., 1988, HIV Prevalence in Mozambican Blood Donors (1987), IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5132.
- B0027 Boshell, J. S., M. G. Gacharna, D. Saavedra et al., 1988, AIDS in Colombia, IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5080.
- B0037 Bailly, C., M. Santiago, M. Abbate, et al., 1988, Situation in Djibouti: Sero Epidemiological Survey, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster.
- B0043 Boshell, J. S., M. G. Gacharna, M. Garcia, et al., 1989, AIDS in Columbia, In: AIDS Profile of an Epidemic, PAHO, Scientific Publication no. 514, pp. 37-44.
- B0078 Behbehani, K., R. Al-Qwaish, A. Abdul-Wahab, et al., 1988, AIDS Detection and Control Strategy in Kuwait, IV International Conference on AIDS, Stockholm, 6/15-16, Poster 5623.
- B0082 Berita, H., 1989, Blood Donors Identified as AIDS Carriers, Joint Publications Research Service: Epidemiology, Dec. 11, no. 018, pp. 9.
- B0088 Bilgiç, A., G. Ugur, S. Erenay, et al., 1990, HIV-1 and Hepatitis B Virus Infection Risk for the Healthcare Workers of Anesthesiology and Reanimation in Turkey, VI International Conference on AIDS, San Francisco, 6/20-24, Abstract 3177.
- B0092 Bakouan, D., M. Lorenz, L. H. Ouedraogo, et al., 1990, Kap-Study and HIV-Seroprevalence among Prostitutes in Rural Burkina Faso, VI International Conference on AIDS, San Francisco, 6/20-24, Session Th.D.52.
- B0108 Benoit, S. M., G. M. Gershy-Damet, A. Coulibaly, et al., 1990, Seroprevalence of HIV Infection in the General Population of the Cote d'Ivoire, West Africa, Journal of Acquired Immune Deficiency Syndromes, vol. 3, no. 12, pp. 1193-1196.
- B0127 Bazabana, M., J. C. Loukaka, P. M'Pele, et al., 1991, Tendence de l'Infection a VIH chez les Femmes Encientes au Congo, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster M.A.268.
- B0132 Bigot, A., M. Bodeus, G. Burtonboy, 1992, Prevalence of HIV Infection among Prostitutes in Benin (West Africa), Journal of Acquired Immune Deficiency Syndromes, vol. 5, no. 3, pp. 317-319.

- B0137 Bernvil, S. S., K. Sheth, M. Ellis, et al., 1991, HIV Antibody Screening in a Saudi Arabian Blood Donor Population: 5 Years Experience, *Vox Sanguinis*, vol. 61, no. 1, pp. 71-73.
- B0138 Boulos, R., J. Coberly, P. Losikoff, et al., 1992, Risk Factors Associated with HIV Infection in Adults Responding to a Community Based TB/HIV Prevention Program, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4061.
- B0144 Bhave, G. G., U. D. Wagle, S. Desai, et al., 1992, HIV II Prevalence in Prostitutes of Bombay, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4623.
- B0162 Bazabana, M. M., J. C. Loukaka, M. Makuwa, et al., 1992, Surveillance par Réseau de Postes Sentinelles au Niveau District 1991 - 1992: Experience Congolaise, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.032.
- B0169 Ben Salem, M., M. Ben Rachid, C. Hankins, et al., 1993, STD/HIV Seroprevalence among Women Attending an Antenatal Clinic in Tunis, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C09-2792.
- B0174 Buzingo, T., Y. Alexandre, A. Kamuragiye, et al., 1993, The Epidemiology of HIV and AIDS in Burundi, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C07-2750.
- B0179 Bahamas Ministry of Health, Community Health Service, 1993, PAHO/WHO HIV Surveillance, May 18, Pan American Health Organization/World Health Organization.
- B0186 Barbados Ministry of Health, 1993, PAHO/WHO HIV Surveillance, Jan. 13, Pan American Health Organization/World Health Organization.
- B0187 Barbados Ministry of Health, 1992, PAHO/WHO HIV Surveillance, Oct. 23, Pan American Health Organization/World Health Organization.
- B0188 Barbados Ministry of Health, 1992, PAHO/WHO HIV Surveillance, Aug. 17, Pan American Health Organization/World Health Organization.
- B0189 Barbados Ministry of Health, 1992, PAHO/WHO HIV Surveillance, Apr. 6, Pan American Health Organization/World Health Organization.
- B0206 British Virgin Islands Public Health Department, 1992, PAHO/WHO HIV Surveillance, Sept. 15, Pan American Health Organization/World Health Organization.
- C0005 Chungue, E., F. Flye Sainte Marie, J. L. Cartel, et al., 1987, Actual Situation of HIV Infections in French Polynesia, III International Conference on AIDS, Washington, D.C., 6/1-5, Abstract TP.139.
- C0033 Chout, R., V. Ursulet, P. Leguyader-Despres, et al., 1988, 3 Years Follow-up Study of the HIV Infection in High Risk Groups and Control Groups in Martinique, IV International Conference on AIDS, Stockholm, 5/11-15, Poster 5519.
- C0067 Chout, R., D. Cales-Quist, M. Verdier, et al., 1989, 4 Year Follow-Up Study of the HIV Infection in High Risk and Control Groups in Martinique (F.W.I), V International Conference on AIDS, Montreal, 6/4-9, Poster 1212.
- C0089 Capdevielle, P., J. Gueziec, C. Menager, et al., 1989, HIV and AIDS in New Caledonia, *Medecine Tropicale*, vol. 49, no. 1, pp. 11-16.
- C0093 Coulibaly, Y. N., J. L. Sankale, A. Gueye, et al., 1989, HIV-1 and HIV-2 in Mauritania, IV International Conference on AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Abstract 028.
- C0101 Constantine, M. T., M. F. Sheba, D. M. Watts, et al., 1990, HIV Infection and AIDS in Egypt: A Cumulative Surveillance Over 3 1/2 Years, VI International Conference on AIDS, San Francisco, 6/20-24, Poster 1010.
- C0112 Cabello, A., M. Cabral, E. Vera, et al., 1991, The Risk of Sexually-Acquired HIV Infection in Paraguay, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster M.C.3225.
- C0122 Corwin, A. L., J. G. Olson, M. A. Omar, et al., 1991, HIV-1 in Somalia: Prevalence and Knowledge among Prostitutes, *AIDS*, vol. 5, no. 7, pp. 902-904.
- C0131 Chang, Y. H., H. M., Hsu, C. Y. Chuang, et al., 1992, Surveillance of HIV and AIDS in Taiwan, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4074.
- C0132 Chao, A., P. Habimana, M. Bulterys, et al., 1992, Oral Contraceptive Use, Cigarette Smoking, Age at First Sexual Intercourse, and HIV Infection among Rwandan Women, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4338.
- C0138 Chan, R. K. W., A. Fakar, G. C. Leok, 1992, Voluntary Confidential and Unlinked Anonymous HIV Testing in a Clinic in Singapore, 2nd International Congress on AIDS in Asia and Pacific, New Delhi, India, 11/8-12, Poster A104.

- C0141 Couzineau, B., J. Bouloumie, P. Hovette, et al., 1991, Prevalence of HIV Infection in a Target Population in the Republic of Djibouti, *Medecine Tropicale*, vol. 51, no. 4, pp. 485-486.
- C0143 Cleghorn, F., M. Jack, M. Greenberg, et al., 1993, HIV-1 Seroincidence in an STD Clinic in Trinidad: Rapid Spread of an Mn-like Virus, IX International Conference on AIDS, Berlin, 6/6-11, Abstract WS-C14-3.
- C0152 Carneiro-Proietti, A., M. V. Martins, S. Brener, et al., 1993, HIV-1/2 and HTLV-1/II among Eligible Blood Donors from Minas Gerais State, Brasil, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C06-2714.
- D0020 De la Cruz, F., J. Barreto, C. Palma de Sousa et al., 1988, Seroepidemiological Study on HIV-1 and HIV-2 Prevalence in Mozambican General Population - 1987, IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5056.
- D0033 Dayrit, M. M., O. T. Monzon, V. Basaca-Sevilla, et al., 1987, Emerging Patterns of HIV Infection and Control in the Philippines, *Western Journal of Medicine*, vol. 147, pp. 723-725.
- D0096 Diaw, I., I. Thior, T. Siby, et al., 1991, Prevalence du VIH et MST Majeures chez les Prostituees Nouvellement Inscrites, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Session W.O.128.
- D0105 Diaw, I., T. Siby, I. Thior, et al., 1992, HIV and STD Infections among Newly Registered Prostitutes in Dakar, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PoC 4333.
- D0112 Diallo, M. O., V. Traore, M. Maran, et al., 1992, Sexually Transmitted Diseases and HIV-1/HIV-2 Infections among Pregnant Women Attending Antenatal Clinic in Abidjan, Cote d'Ivoire, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.041.
- D0113 Diouf, A., H. G. Mbaye, F. Lebe, et al., 1992, Infections a VIH et Perinatalite a Dakar, VIII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.223.
- D0114 Davo, M., C. Adjovii, S. Anagonou, et al., 1992, Approche de l'Epidemie VIH/SIDA au Benin, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.018.
- D0120 Dada, A. J., F. Oyewole, R. Onofowokan, et al., 1993, Lagos, Nigeria-New Delhi, India HIV-1 Connection among High Class Prostitutes, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C07-2744.
- E0024 Echeverria de Perez, G., O. Loreto, N. E. Blanco, et al., 1992, Reappraisal of Human Retroviral Infection in Venezuela, *AIDS Research and Human Retroviruses*, vol. 8, no. 2, pp. 219-220.
- E0036 Epidemiology Unit, Centinel Site, 1991, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- F0007 Freeman, C. P., E. K. Kollie, L. H. Reithner, et al., 1988, Microeliza HIV Antibody Testing in Two Areas of Liberia West Africa, IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5017.
- F0017 Fox, E., E. A. Abbatte, H. H. Wassef, et al., 1989, Low Prevalence of HIV Infection in Djibouti: Has the AIDS Epidemic Come to a Stop at the Horn of Africa?, *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 83, no. 1, pp. 103-106.
- F0024 Fay, O., G. Mucirnik, J. Rey, et al., 1989, HIV-Infection in Voluntary Blood Donors in Argentina, V International Conference on AIDS, Montreal, 6/4-9, Poster M.G.O. 29.
- F0037 Fay, O., M. Taborda, A. Fernandez, et al., 1991, HIV Seroprevalence among Different Communities in Argentina after Four Years of Surveillance, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster M.C.3263.
- F0038 Fulayfil, R., Z. H. B. Baig, 1991, Prevalence of HIV Antibodies in High Risk Groups, Bahrain, VII International Conference on AIDS, Florence, Italy, 6/16-21, Abstract M.D.4161.
- F0047 Fernandes, M. E., A. Reingold, M. Hearst, et al., 1992, HIV in Commercial Sex Workers in Sao Paulo, Brazil, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4190.
- F0050 Fernandes, A., R. G. Vaz, A. Esteves, et al., 1992, HIV Seroprevalence among War Displaced Population in a Rural Settlement (Inhaca Island) in Mozambique, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PoC 4708.
- F0055 Frerichs, R. R., M. T. Htoon, N. Eskes, et al., 1992, Comparison of Saliva and Serum for HIV Surveillance in Developing Countries, *Lancet*, vol. 340, no. 8834/8835, pp. 1496-1499.
- F0059 Far Eastern Economic Review, 1993, Vietnam AIDS Test, *Far Eastern Economic Review*, vol. 156, no. 6, p. 14.
- G0005 Gurtler, L., J. Eberle, F. Deinhardt, et al., 1987, Prevalence of HIV-1 in Selected Populations of Areas in Malawi, II International Symposium: AIDS and Associated Cancers in Africa, Naples, Italy, 10/7-9, Abstract TH-44.

- G0015 Giraldo, G., D. Serwadda, R., Mugerwa, et al., 1988, Seroepidemiologic Analyses on Populations from Uganda and Tunisia-High and Low Risk African Regions for HIV Infections Respect., IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5038.
- G0048 Giordano, M., J. Pape, W. Blattner, et al., 1989, The Seroprevalence of HTLV-1 and HIV-1 Co-Infection in Haiti, V International Conference on AIDS, Montreal, 6/4-9, Poster M.G.P. 3.
- G0073 Guerma, T., P. M'Pele, J. C. Loukaka, et al., 1990, Serosurveillance de l'Infection a VIH Par Réseau des Postes Sentinelles Parmi les Femmes Enceintes et des Malades Atteints..., V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.3.
- G0091 Giasuddin, A. S. M., M. M. Ziu, I. A. Shaafie, et al., 1991, Brucella and HIV-1 Antibodies in Libyan Blood Donors, Journal of Infection, vol. 22, no. 3, pp. 294-296.
- G0092 Goubau, P., K. Kazadi, H. Carton, et al., 1991, HTLV-1 in Zaire and its Relationship to HIV, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster T.A.159.
- G0095 Grant, R. M., M. S. Hellmann, P. S. Nsubuga, et al., 1992, Trends of HIV Seroprevalence and Risk Behaviors in STD Patients in Uganda, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4022.
- G0100 Gomez, E., A. Ramirez, C. Pena, et al., 1992, Sentinel Seroprevalence Surveys for HIV-1 Infection in the Dominican Republic, VIII International Conference on AIDS, Amsterdam, 7/19-24 Poster PoC 4066.
- G0105 Gichangi, P., M. Temmerman, A. F. Mohamed, et al., 1992, Rapid Increase in HIV-1 Infection and Syphilis between 1989 and 1991 in Pregnant Women in Nairobi, Kenya, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4029.
- G0106 Goodman, S., V. Calventi, M. Lavendera, et al., 1992, Risk Behaviors for HIV among Women of Childbearing Age in the Urban Dominican Republic, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4363.
- G0112 Garcia-Calleja, J. M., L. Zekeng, S. Abbenyi, et al., 1992, Validation of the Results Found in Pregnant Women Sentinel Site for HIV Infection in Yaounde, Cameroon, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.037.
- G0123 Gayle, C., J. Farley, 1993, Trends in Patterns of Transmission Over 10 Years of the AIDS Epidemic in the English-Speaking Caribbean and Suriname, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C06-2710.
- G0137 Guyana Ministry of Health AIDS Programme, 1993, PAHO/WHO HIV Surveillance, Feb. 1, Pan American Health Organization/World Health Organization.
- G0139 Grenada Ministry of Health, 1991, PAHO/WHO HIV Surveillance, Aug. 13, Pan American Health Organization/World Health Organization.
- G0140 Grenada Ministry of Health, 1991, PAHO/WHO HIV Surveillance, Apr. 25, Pan American Health Organization/World Health Organization.
- H0025 Hayes, C., C. Manaloto, L. Padre, et al., 1989, Prospective Studies on HIV Infections of Prostitutes in the Philippines, V International Conference on AIDS, Montreal, 6/4-9, Poster Th.G.O. 25.
- H0046 Hailu, K., B. Desta, D. Zewdie, 1990, Prevalence of HIV-1 Antibodies in Pregnant Women in Addis Ababa, Ethiopia, VI International Conference on AIDS, San Francisco, 6/20-24, Abstract 3154.
- H0061 Herald, The, 1991, One in Six Expectant Mothers HIV Positive, The Herald Newspaper, Thursday, March 21, p. 1.
- H0083 Herrera, F., M. E. Gallardo, 1992, Nation-Wide HIV1 Seroprevalence in Mexican Blood Donors: Third Report, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4065.
- H0086 Hasan, M., D. Barsoum, 1992, Acceptability of Screening for HIV Infection among Women Attending Family Planning Clinics in Cairo, Egypt, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PoD 5143.
- H0092 Hwa-Chen, L., 1993, Prevalence of HIV-1 and HIV-2 in STD Patients in Taipei, IX International Conference on AIDS, Berlin, 6/6-11, Abstract PO-C20-3087.
- J0009 Josse, R., E. Delaporte, A. Trebuco, et al., 1988, Seroepidemiological Survey of HIV Infection in Equatorial Guinea, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster TP 12.
- J0022 Joshi, S. H., S. S. Chipkar, R. S. Patil, 1992, HIV-1 and HIV-2 Infection in Bombay, 2nd International Congress on AIDS in Asia and Pacific, New Delhi, India, 11/8-12, Poster B319.
- J0028 Jeannel, D., B. Garin, 1992, HTLV-1 and HIV in the Republic of Guinea and in Inongo, Zaire, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster W.RT.Jeannel.
- J0034 Jamaica Ministry of Health Epidemiology Unit, 1991, PAHO/WHO HIV Surveillance, May 1, Pan American Health Organization/World Health Organization.

- K0007 KPL (Vientiane), 1991, One HIV-Positive Case Discovered in Vientiane, Joint Publications Research Service: *Epidemiology*, April 8, no. 007, p. 8.
- K0026 Kam, C. C., T. Schwarz, B. C. Dando, et al., 1988, Prevalence of HIV1 in Mauritius, IV International Conference on AIDS, Stockholm, 6/15-16, Poster 5520.
- K0033 Kanki, P. J., S. M'Boup, D. Richard, et al., 1987, Human T-lymphotropic Virus Type 4 and the Human Immunodeficiency Virus in West Africa, *Science*, vol. 236, no. 4803, pp. 827-831.
- K0060 Kosia, A., T. Kargbo, E. Makiu, et al., 1989, Prevalence of HIV-I and HIV-II among Blood Donors in Sierra Leone, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 390.
- K0074 Kourouma, K., K. Kaba, L. Koivogui, 1990, Seroprevalence de l'Infection a VIH Chez les Donneurs de Sang a Conakry, Guinee, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.6.
- K0076 Kirsch, T., A. J. Rasamindrakotokra, U. Hof, et al., 1990, Introduction of a Nationwide HIV Sentinel Surveillance System in Madagascar, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.17.
- K0096 Kanyama, I. D. A., 1991, Sentinel Surveillance of HIV Infection in Northern Zambia, VII International Conference on AIDS, Florence, Italy, 6/16-21, Abstract M.C.3301.
- K0116 Katlama, C., F. Simon, E. Pichard, et al., 1991, Infection VIH1, VIH2 et VIH1&2 chez des Femmes Prostituees au Mali, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Session M.O.137.
- K0125 Kapiga, S., D. J. Hunter, J. F. Shao, et al., 1992, Contraceptive Practice and HIV-1 Infection among Family Planning Clients in Dar es Salaam, Tanzania, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4343.
- K0127 Karita, E., P. Van de Perre, A. Nziyumvira, et al., 1992, HIV Seroprevalence among STD Patients in Kigali, Rwanda, during the Four-Year Period 1988-1991, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4468.
- K0155 Kabwa, P., G. Sahlmueller, F. V. Sonnenburg, et al., 1993, Comparison of HIV Prevalence in Different Groups in Kabarole District, Western Uganda, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C29-3253.
- L0022 Lopes Martins, J., W. F. Canas Ferreira, E. Prieto, et al., 1988, Study of HIV-1 and HIV-2 Infection in Sao Tome Island, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster P 5.
- L0040 Lecatsas, G., J. J. Joubert, C. H. J. Schutte, et al., 1988, HIV Seropositivity in East Caprivi, SEA/Namibia, *South African Medical Journal*, vol. 74, pp. 590-591.
- L0074 Lakiss, S., K. Kourouma, M. P. Diallo, et al., 1991, HIV-1/2 Seroprevalence in Guinea Conakry, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster M.C.3300.
- L0086 Lankoande, S., A. Rochereau, D. S. Mugrditchian, et al., 1991, Etiologies of Urethritis and GUD in Young Men Attending Health Centers in Bobo-Dioulasso, Burkina Faso, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Session W.O.124.
- L0097 Leong, S., C. K. Lin, K. W. Mak, 1992, Prevention of Transfusion Transmitted HIV Infection in Hong Kong by the Blood Transfusion Service, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoD 5166.
- L0119 Ladner, J., A. De Clercq, M. Nyiraziraje, et al., 1993, HIV Seroprevalence and Counselling in Pregnant Women: A Cohort Study in Kigali (Rwanda), 1992, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-D15-3884.
- L0123 Lake, E. T., H. L. Smith, L. H. Aiken, et al., 1993, HIV Surveillance and Transmission Patterns in Santiago de Chile 1991, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C06-2700.
- L0125 Laboratorio Nacional de Referencia, 1991, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- L0128 Lezama, L., 1990, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- M0060 Mintz, E., R. Peale, S. K. Mathur, et al., 1988, A Serologic Study of HIV Infection in Liberia, *Journal of Acquired Immune Deficiency Syndromes*, vol. 1, no. 1, pp. 67-68.
- M0078 Melgar, M. L., F. Mavario, J. Mariscal, et al., 1989, Seroprevalence of HIV Infection in Bolivia, V International Conference on AIDS, Montreal, 6/4-9, Abstract G. 512.
- M0101 Murzi, M., 1989, Plan to Combat AIDS, Testing Described, Joint Publications Research Service: *Epidemiology*, Sept. 28, no. 016, pp. 17-18.
- M0134 McCarthy, M. C., El Hag, A. E.T., 1990, HIV-1 Infection in Juba, Southern Sudan, VI International Conference on AIDS, San Francisco, 6/20-24, Poster F.C.605.

- M0139 Ministry of Health (Syria), 1990, AIDS Testing Activities of the National AIDS Control Programme in Syria, Unpublished.
- M0143 Mingle, J., M. Osei-Kwesi, P. Antwi, et al., 1990, HIV-1 and HIV-2 Seroprevalence in Three Population Groups in Ghana, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.5.
- M0146 Mefane, C., D. Benoni, M. Guerch, et al., 1989, Seroprevalence des Infections a Retrovirus Humains a Libreville (Gabon), *Medecine d'Afrique Noire*, vol. 36, no. 6, pp. 491-496.
- M0186 Modan, B., R. Goldschmidt, E. Rubinstein, et al., 1992, Prevalence of HIV Antibodies in Transsexual and Female Prostitutes, *American Journal of Public Health*, vol. 82, no. 4, pp. 590-592.
- M0204 Manny, N., S. Maayan, A. Vansover, et al., 1992, HIV1 Rates at Hadassah Hospital Blood Donors 1986-1991, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PoC 4006.
- M0205 Mejia, C., M. Samcam, E. Quinonez, et al., 1992, Human Immunodeficiency Virus (HIV) Infection in Guatemala, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PuC 8137.
- M0228 Mujeeb, S. A., M. Rafiq Khanani, T. Khursheed, et al., 1991, Prevalence of HIV-Infection among Blood Donors, *Journal of the Pakistan Medical Association*, vol. 41, no. 10, pp. 253-254.
- M0235 Martinez, A. B., 1992, AIDS in El Salvador, *Links*, vol. 9, no. 1, p. 16.
- M0237 Makiu, E. J. K., A. M. Kosia, W. Mansaray, 1992, A Strategy to Control HIV Infection among Female Commerical Sex Workers (CSW) and Their Clients in Freetown, Sierra Leone, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Abstract T.P.098.
- M0241 Mahomed, K., J. Kasule, D. Makuyana, et al., 1991, Seroprevalence of HIV Infection amongst Antenatal Women in Greater Harare, Zimbabwe, *Central African Journal of Medicine*, vol. 37, no. 10, pp. 322-325.
- M0242 Menjivar, A., J. Fernandez, 1991, KAP's on AIDS and HIV/AIDS Seroprevalence Studyicas Sobre V.I.H./SIDA Y Estudio de Seroprevalencia de V.I.H. en Mujeres ..., National AIDS Control Program, Ministry of Health, unpublished report.
- M0243 Mungai, J. N., J. Ombette, J. Kimani, et al., 1992, Laboratory Findings for the Prevalence of HIV, Neisseria Gonorrhoea and Chlamydia Trachomatis Infections among Prostitutes ..., VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Abstract W.P.189.
- M0247 Maiga, M. K., H. A. Sangho, S. Fongoro, 1992, Transmission Materno-Foetale du Sida au Mali, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Abstract T.P.220.
- M0251 Menya, D., K. Wools, F. Mulli, et al., 1992, Prevalence of Common Sexually Transmitted Diseases (STDs) in Women Attending Maternal and Child Health (MCH) Clinics in a ..., VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster W.P.186.
- M0256 Mhalu, F., A. Swai, D. Mwakagile, et al., 1992, Surveillance and Control of HIV-1 Transmission among Female Bar workers in Dar es Salaam 1986-1991, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.108.
- M0265 Minister of Public Health, 1993, Serosurveillance Report of HIV Infection, Republic of Zaire, National Control Programme Against AIDS, Central Coordination Bureau, BCC/SIDA, Official Report.
- M0266 Ministry of Public Health & Social Affairs, 1992, WHO Report on AIDS Surveillance, SFI/GPA/WHO/11.8, Official Report.
- M0267 Ministry of Health Kingdom of Lesotho, 1993, HIV Prevalence data, In: Update on HIV/AIDS in Lesotho, Disease Control and Environmental Health Division, WHO, March 1993, pp. 8-10.
- M0272 Monny-Lobe, M., M. Ella, V. Ngoumou, et al., 1993, A Comparative HIV Seroprevalence Study among CSWs in Yaounde and Douala - Cameroon, IX International Conference on AIDS, Berlin, 6/6-11, Abstract PO-C31-3300.
- M0274 Myoung-Don, O., C. Kangwon, S. Yungoh, et al., 1993, Current Status of HIV/AIDS Epidemic in South Korea, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C08-2769.
- M0275 May, S. B., M. A. Perez, M. E. Pinto, et al., 1993, High Prevalence of HIV-1 Infection in a Representative Sample of Childbearing Women in Rio de Janeiro, Brazil, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C11-2856.
- M0278 Montserrat Health Department, 1993, PAHO/WHO HIV Surveillance, Feb. 3, Pan American Health Organization/World Health Organization.
- M0279 Montserrat Health Department, 1992, PAHO/WHO HIV Surveillance, Nov. 10, Pan American Health Organization/World Health Organization.
- M0280 Montserrat Health Department, 1992, PAHO/WHO HIV Surveillance, June 2, Pan American Health Organization/World Health Organization.

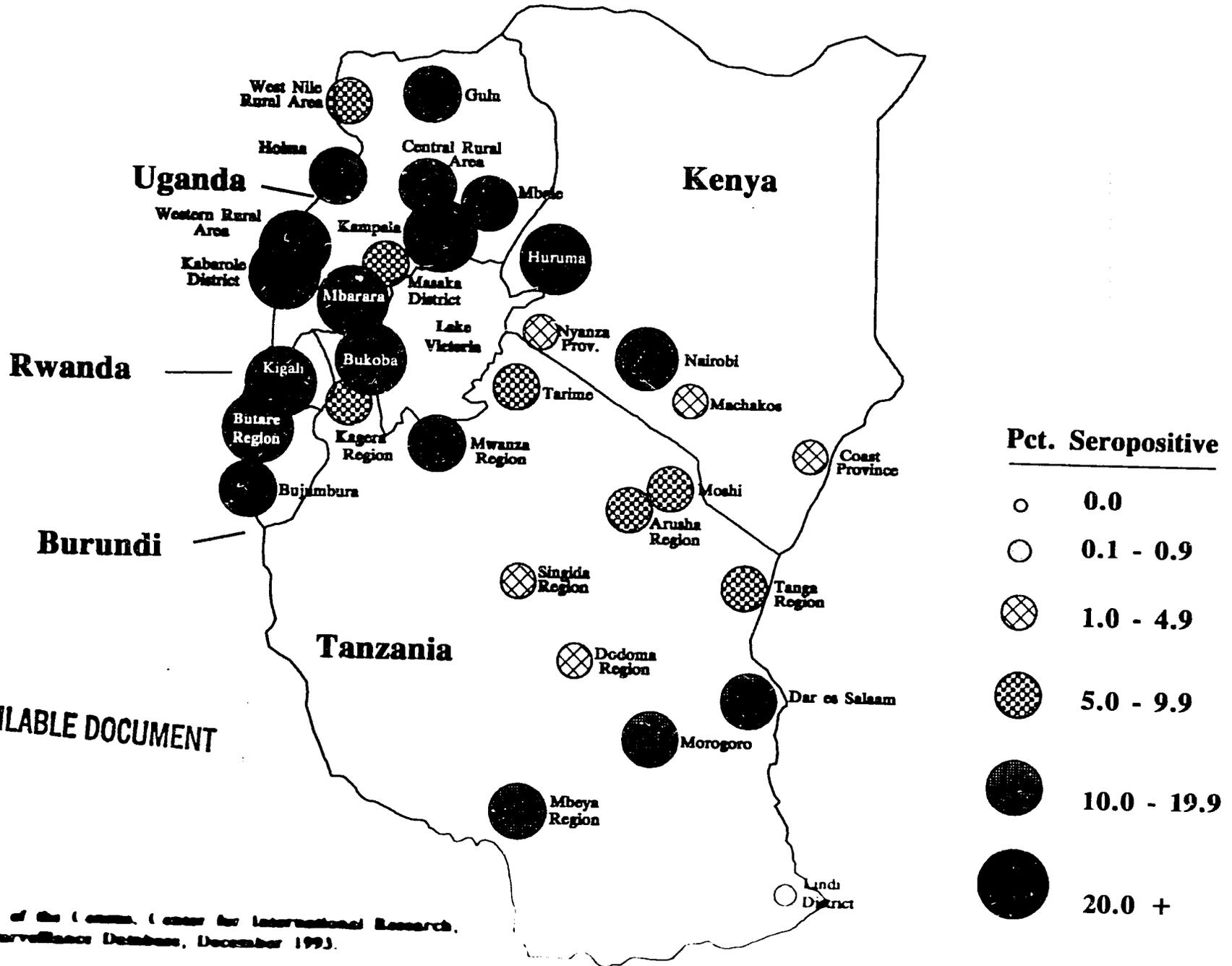
- M0287 Minsalud, 1991, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- M0297 Ministerio de Salud Publica, 1991, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- N0003 New Visions, 1987, AIDS Incidence Termed "Alarming", Joint Publications Research Service: Epidemiology, April 27, no. 010, p. 71.
- N0083 NACP/MOH (Ethiopia), 1992, Surveillance and Research Activities on HIV/AIDS: Activities Accomplished So Far in Ethiopia, 1984-1991, Ethiopia NACP/MOH data, unpublished report.
- N0087 NACP, 1992, Report on the First HIV Sentinel Surveillance in Botswana, July, Unpublished Report.
- N0097 Namboze, J. M., 1993, AIDS/HIV Update - Botswana, WHO/Botswana, unpublished memo.
- N0110 Nicaragua, 1991, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- O0029 Ouedraogo, L. H., N. Lorenz, D. Bakouan, et al., 1990, HIV - Baseline Study in the General Population of Corom Corom/Burkina Faso, VI International Conference on AIDS, San Francisco, 6/20-24, Poster F.C.595.
- O0044 Ousseini, H., J. L. Pecarrere, D. Meynard, et al., 1991, Evolution de la Seroprevalence des Infections a VIH1 et VIH2 a l'Hopital National de Niamey, Niger, Bulletin de la Societe de Pathologie Exotique, vol. 84, no. 3, pp. 235-239.
- P0018 Pereira, M., A. H. dePereira, C. A. Garcia, et al., 1988, First Study on the Prevalence of HIV in the Forces of Defense of Panama, IV International Conference on AIDS, Stockholm, 6/13-14, Abstract 5088.
- P0059 Petat, E., F. Martinet, F. Barin, 1990, Prevalence of HIV Infection in the Comoros Islands (Indian Ocean), Journal of Acquired Immune Deficiency Syndromes, vol. 3, no. 11, pp. 1115-1117.
- P0062 Pepin, J., G. Morgan, D. Dunn, et al., 1991, HIV-2-Induced Immunosuppression among Asymptomatic West African Prostitutes: Evidence that HIV-2 is Pathogenic, but less so ..., AIDS, vol. 5, no. 10, pp. 1165-1172.
- P0074 Pyndiah, N., C. Chan Kam, B. Jowaher, et al., 1991, Prevalence of HIV/AIDS in Mauritius, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster M.C.3285.
- P0096 Peak, A. M., S. Rana, M. Aryal, et al., 1992, Development and Implementation of a Needle Exchange Programme for Injecting Drug Users in Nepal, 2nd International Congress on AIDS in Asia and Pacific, New Delhi, India, 11/8-12, Poster B208.
- P0103 Procupet, A., L. Fernandes, C. Lemos, 1992, Seroprevalence du VIH chez les Donneurs de Sang de Onze Provinces de la Republique d'Angola, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.158.
- R0044 Rota, S., A. Yildiz, H. Guner, et al., 1989, HIV Antibody Screening in a Gynecology and Obstetrics Clinic Ankara, Turkey, International Journal of Gynaecology and Obstetrics, vol. 30, no. 4, pp. 395-396.
- R0046 Riyad, M., O. Serrhini, S. Sekkat, et al., 1990, Transmission Sexuelle du HIV au Maroc, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.C.5.
- R0059 Ricard, D., H. A. Wilkins, A. P. da Silva, et al., 1991, HIV-2 Infection in a Rural Area of Guinea Bissau, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster T.A.142.
- R0065 RSA Department of National Health and Population Development, 1991, AIDS in South Africa: Status on World AIDS Day 1991, Epidemiological Comments, vol. 18, no. 11, pp. 229-249.
- R0089 RSA Dept. of National Health and Population Development, 1993, Third National HIV Survey of Women Attending Antenatal Clinics, South Africa, October/November 1992, Epidemiological Comments, vol. 20, no. 3, pp. 35-50.
- R0090 Riedner, G., Y. Hemed, F. Minja, et al., 1993, The Use of Serologic Trends of HIV and Syphilis for the Evaluation of the Mbeya Regional ACP Tanzania 1986-1992, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C29-3263.
- R0093 Reyes, O., Q. Leoro, M. Aguilar, et al., 1993, Sentinel Serosurveillance for HIV in STD Patients, Quito, Ecuador, 1991-1992, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C20-3085.
- S0043 Santos-Ferreira, M., M. Matos Almeida, A. Lourenco, et al., 1988, HIV 1 and HIV 2 Seroprevalence in Patients Attending an STD-Clinic in Lunda-Norte, N.E. Province of Popular Republic of Angola, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster TP 16.
- S0145 Sangare, L., N. Luki, K. Travers, et al., 1991, Infections a VIH chez les Femmes Enceintes a Bobo-Dioulasso (Burkina-Faso), VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster M.A.286.
- S0152 Schrijvers, D., E. Delaporte, M. Peeters, et al., 1988, Role of Sexually Transmissible Pathogens in Transmitting HIV-1, Genitourinary Medicine, vol. 64, no. 6, pp. 395-396.
- S0161 Shiokawa, Y., K. Soda, K. Nishioka, et al., 1992, Current Status of HIV/AIDS Epidemic in Japan, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4085.

- S0195 Skalaky, J., 1992, HIV and AIDS in a Rural Area of the South West Province of Cameroon, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.007.
- S0209 Somma, V., B. Rivas, M. Correa, 1993, Prostitution and AIDS in Uruguay, IX International Conference on AIDS, Berlin, 6/6-11, Abstract PO-D09-3669.
- S0215 Singh, S., N. Crofts, D. Gertig, 1993, HIV Infection among IDUs in North-East Malaysia, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C08-2777.
- S0217 Saint Lucia STD/HIV Prevention Programme, 1992, PAHO/WHO HIV Surveillance, June 30, Pan American Health Organization/World Health Organization.
- S0218 Saint Lucia STD/HIV Prevention Programme, 1992, PAHO/WHO HIV Surveillance, Pan American Health Organization/World Health Organization.
- S0220 Saint Lucia STD/HIV Prevention Programme, 1993, PAHO/WHO HIV Surveillance, Jan. 10, Pan American Health Organization/World Health Organization.
- S0221 Saint Lucia STD/HIV Prevention Programme, 1992, PAHO/WHO HIV Surveillance, Oct. 8, Pan American Health Organization/World Health Organization.
- S0227 St. Kitts & Nevis Ministry of Health & Women's Affairs, 1992, PAHO/WHO HIV Surveillance, Apr. 14, Pan American Health Organization/World Health Organization.
- S0234 St. Vincent & the Grenadines Public Health Department, 1992, PAHO/WHO HIV Surveillance, Apr. 13, Pan American Health Organization/World Health Organization.
- S0235 St. Vincent & the Grenadines Public Health Department, 1992, PAHO/WHO HIV Surveillance, July 21, Pan American Health Organization/World Health Organization.
- S0236 St. Vincent & the Grenadines Public Health Department, 1992, PAHO/WHO HIV Surveillance, Oct. 5, Pan American Health Organization/World Health Organization.
- S0241 St. Kitts & Nevis Ministry of Health & Women's Affairs, 1993, PAHO/WHO HIV Surveillance, Jan. 29, Pan American Health Organization/World Health Organization.
- S0242 St. Kitts & Nevis Ministry of Health & Women's Affairs, 1992, PAHO/WHO HIV Surveillance, Oct. 27, Pan American Health Organization/World Health Organization.
- S0244 Surinam National AIDS Programme, 1991, PAHO/WHO HIV Surveillance, Apr. 25, Pan American Health Organization/World Health Organization.
- S0245 Surinam National AIDS Programme, 1991, PAHO/WHO HIV Surveillance, Sept. 11, Pan American Health Organization/World Health Organization.
- S0246 Surinam National AIDS Programme, 1991, PAHO/WHO HIV Surveillance, Jan. 30, Pan American Health Organization/World Health Organization.
- T0040 Tembo, G., E. Van Praag, H. Mutambo, et al., 1990, Sentinel Surveillance of HIV Infection in Zambia, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.28.
- T0046 Tondo, M., C. M. Cruz, P. McGreevy, et al., 1991, Three Year Study of Female Prostitutes in a Rural Area in Brazil, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster M.C.3074.
- T0065 Terraza S., R. Solorzano, B. Samayoa, et al., 1992, HIV Infection and Risk Behaviors in a STD Clinic in Guatemala City, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PuC 8227.
- T0085 Traore-Ettiégne, V., P. D. Ghyse, M. O. Diallo, et al., 1993, High Prevalence of HIV Infections and Other STD in Female Prostitutes in Abidjan, IX International Conference on AIDS, Berlin, 6/6-11, Session WS-C08-3.
- T0091 Trinidad & Tobago Ministry of Health, 1993, PAHO/WHO HIV Surveillance, Jan. 20, Pan American Health Organization/World Health Organization.
- T0092 Trinidad & Tobago Ministry of Health, 1992, PAHO/WHO HIV Surveillance, Nov. 5, Pan American Health Organization/World Health Organization.
- T0093 Trinidad & Tobago Ministry of Health, 1992, PAHO/WHO HIV Surveillance, July 18, Pan American Health Organization/World Health Organization.
- T0095 Trinidad & Tobago Ministry of Health, 1992, PAHO/WHO HIV Surveillance, Apr. 13, Pan American Health Organization/World Health Organization.
- T0100 Thailand Ministry of Public Health, 1993, National Sentinel Seroprevalence, June, unpublished tables.
- U0005 Uribe, P., A. M. Hernandez, H. G. Ornelas, et al., 1990, Analysis of Factors Related with HIV Infection in 961 Female Sexual Workers, VI International Conference on AIDS, San Francisco, 6/20-24, Abstract Th.D.777.
- V0017 Virus Information Exchange Newsletter, 1987, AIDS Information Update from WHO Western Pacific Regional Office, Virus Information Exchange Newsletter, vol. 4, no. 3, pp. 74-75.

- W0044 Vietnam News Agency, 1990, AIDS Tests in Ho Chi Minh City, Summary of World Broadcasts, Apr. 25, Third Series FE/W0125, p. A/7.
- W0053 Vaz, R. G., A. Fernandes, R. Bastos, et al., 1992, HIV Seroprevalence among Patients Attending an STD Clinic in Maputo, Mozambique, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PuC 8020.
- W0058 Vera, E., M. Cabral, R. Jimenez, et al., 1992, The First Study of HIV, HBV and Syphilis in Pregnant Women in Paraguay, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4068.
- W0027 Wilkins, A., R. Hayes, P. Alonso, et al., 1991, Risk Factors for HIV-2 Infection in the Gambia, AIDS, vol. 5, no. 9, pp. 1127-1132.
- W0036 White, E., P. Weller, J. P. Figueroa, et al., 1990, National AIDS Control Program, Jamaica Program Director, University of California, San Francisco, VI International Conference on AIDS, San Francisco, 6/20-24, Abstract F.C.591.
- W0060 Whiteside, A., 1992, An Evaluation of the Likely Impact of AIDS on the Mananga Medical Service Subscribing Companies, Draft Report, pp. 1-12.
- W0061 Whiteside, A., 1991, HIV Infection and AIDS in Zimbabwe: An Assessment, Southern Africa Foundation for Economic Research, Economic Research Unit, University of Natal, pp. 1-50.
- W0069 World Health Organization, 1991, Global Programme on AIDS, Weekly Epidemiological Record, vol. 66, no. 35, pp. 257-259.
- W0071 Wade, A., A. Dieng-Sarr, A. A. Diallo, et al., 1992, Tendances Epidemiologiques des Infections HIV-2 et HIV-1 dans une Zone d'Endemicite HIV-2: Experience du Senegal, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.004.
- W0076 WHO/SERRO, AIDS Unit, 1992, HIV Infection/AIDS and Sexually-Transmitted Diseases, Bulletin of Regional Health Information, SEA/HS/186, pp. 65-70.
- W0078 Wong, K. H., S. S. Lee, W. L. Lim, 1993, HIV Surveillance among Drug Users in Hong Kong, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C08-2782.
- Y0013 Yeoh, E., 1990, The Growing Problem of AIDS in Asia, VI International Conference on AIDS, San Francisco, 6/24, Closing Ceremony, vol. 3, p. 93.
- Z0009 Zewdie, D., S. Ayehunie, F. Ketema, et al., 1988, Degree of ELISA False Positivity in Non-risk Groups to HIV-1 Infection, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Abstract WP 26.
- Z0022 Zahraoui, M., F. Denis, K. Marhoum, et al., 1991, Etude de la Seroprevalence des Virus HTLV-1, HIV-1, HIV-2 et Herpes 6 Virus (HHV6) au Maroc, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Abstract T.A.143.
- Z0030 Zapiola, I., M. B. Bouzas, G. Muchnik, et al., 1992, HIV-1 and HTLV-I/II among Prostitutes in Buenos Aires, Argentina, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4661.
- Z0035 Zelaya, J. E., M. Thibaud, R. Oviedo, et al., 1989, Seroprevalence of Anti-HIV Antibodies in Prostitutes from Tegucigalpa and San Pedro Sula, Honduras, National AIDS Control Program: Science and Technology Unit, Family Health International, unpublished report.
- Z0036 Zeng, Y., 1992, HIV Infection and AIDS in China, Archives of STD/HIV Research, vol. 6, no. 4, pp. 1-5.

APPENDIX B

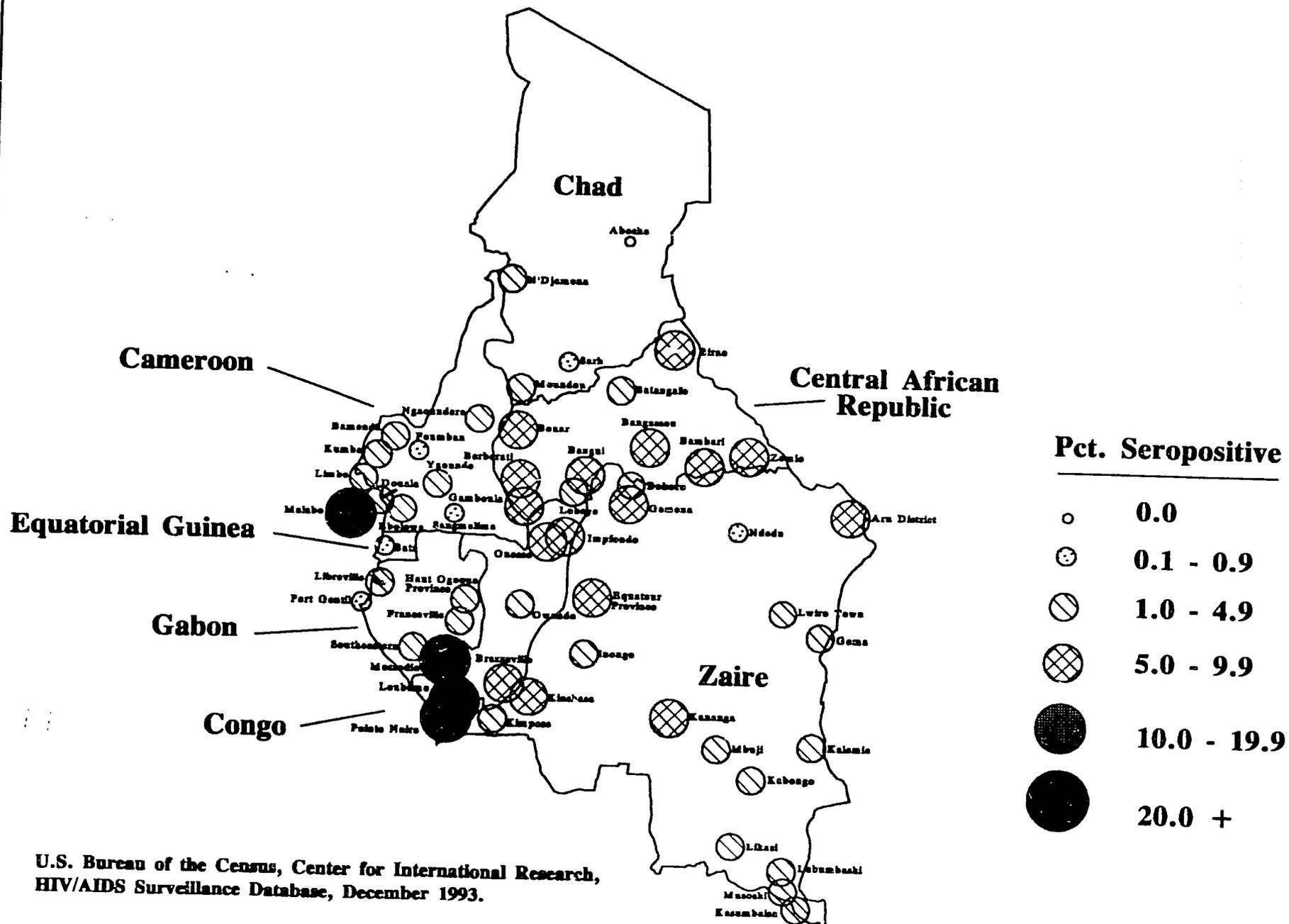
Seroprevalence of HIV-1 for Low-Risk Populations in East Africa



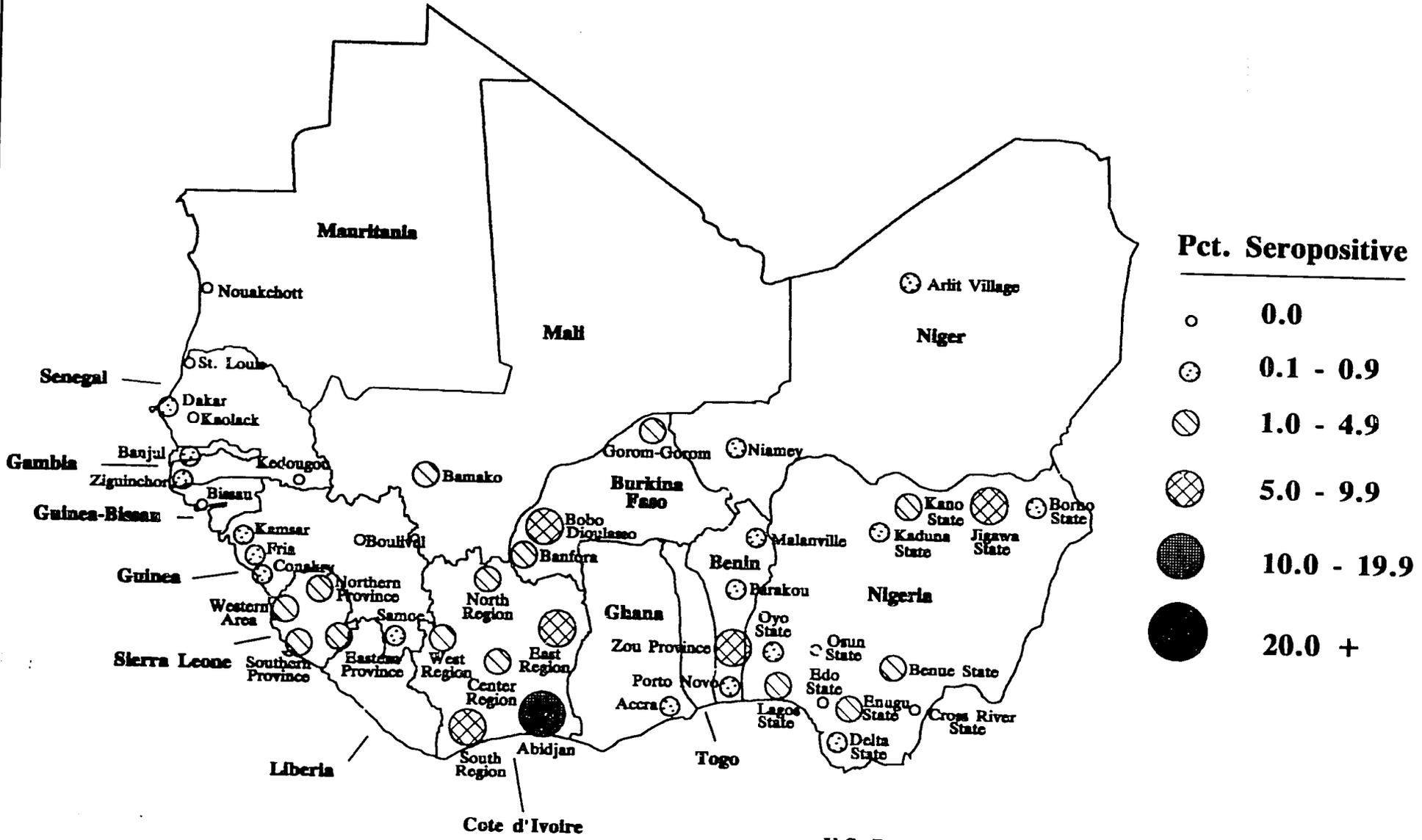
BEST AVAILABLE DOCUMENT

U.S. Bureau of the Census, Center for International Research,
HIV/AIDS Surveillance Database, December 1993.

Seroprevalence of HIV-1 for Low-Risk Populations in Central Africa

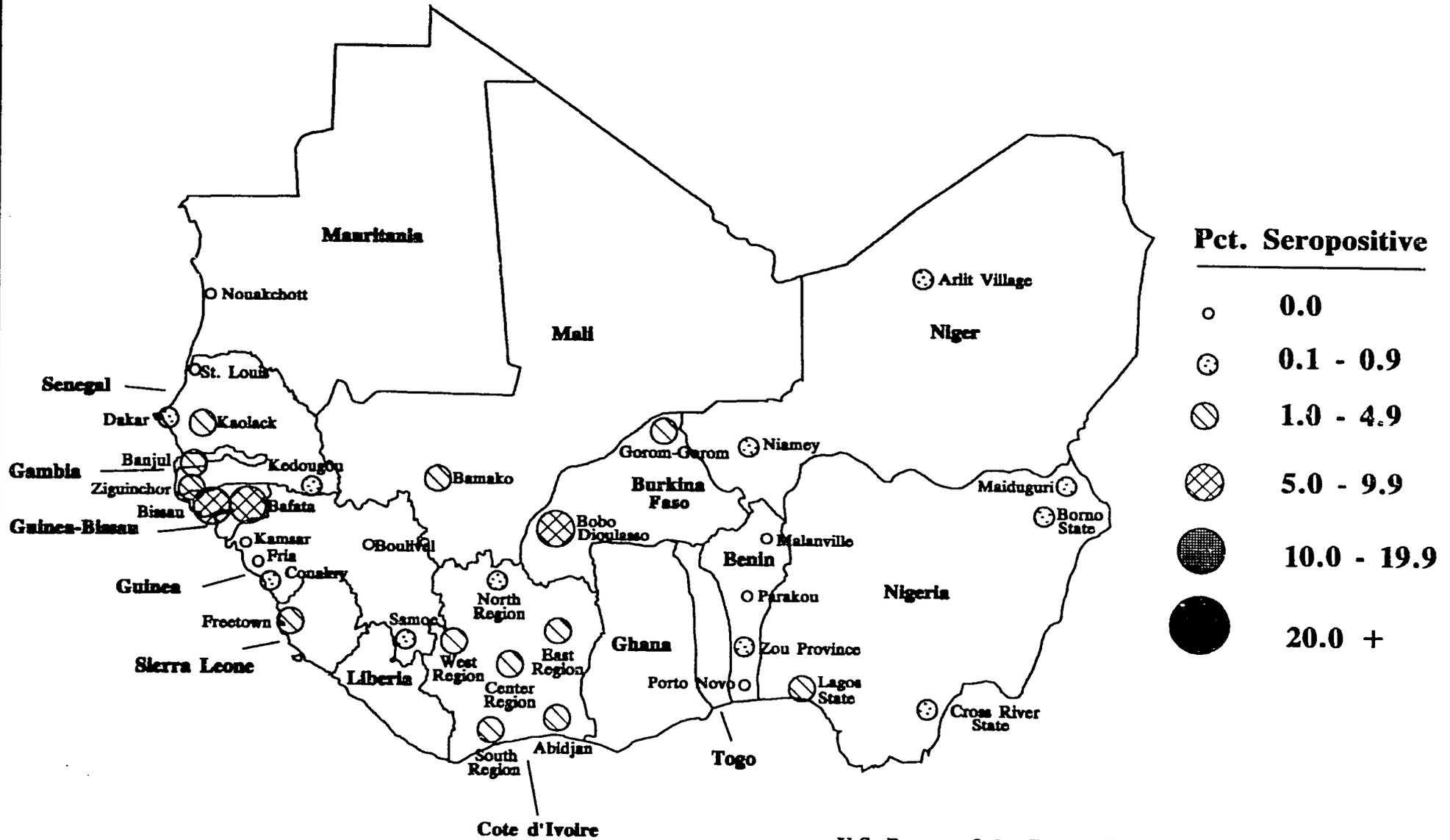


Seroprevalence of HIV-1 for Low-Risk Populations in West Africa



U.S. Bureau of the Census, Center for International Research, HIV/AIDS Surveillance Database, December 1993.

Seroprevalence of HIV-2 for Low-Risk Populations in West Africa



U.S. Bureau of the Census, Center for International Research, HIV/AIDS Surveillance Database, December 1993.

BIBLIOGRAPHY

- Anderson, R., R. May, A. McLean. 1988. "Possible Demographic Consequences of AIDS in Developing Countries." Nature, Vol. 17, No. 332, pp. 228-34.
- Berkley, S., W. Naamara, S. Okware, et al. 1990. "AIDS and HIV Infection in Uganda—Are More Women Infected than Men?" AIDS, Vol. 4., No. 12, pp. 1237-42.
- Carael, M., Carballo, M., Ferry, B., et al. 1991. "Prevalence of High-Risk Sexual Behaviors in Some African Countries: Evidence from Recent Surveys." Poster Session presented at the VII International Conference on AIDS, Florence, Italy, June 16-21, 1991.
- Hethcote, H., and J. Yorke. 1984. Gonorrhea Transmission Dynamics and Control, Lecture Notes in Biomathematics, No. 56., Springer-Verlag, New York.
- Larson, A. 1989. "Social Context of HIV Transmission in Africa: Historical and Cultural Bases of East and Central African Sexual Relations." Review of Infectious Diseases, Vol. 11, pp. 916-31.
- Mann, J. and J. Chin. 1988. "AIDS: A Global Perspective." New England Journal of Medicine, Vol. 319, pp. 302-3.
- Padian, N. 1988. "Prostitute Women and AIDS: Epidemiology." AIDS, Vol. 2, No. 6, pp. 413-19.
- Potts, M., R. Anderson, and M. Boily. 1991. "Slowing the Spread of Human Immunodeficiency Virus in Developing Countries." Lancet, Vol. 338, No. 8767, pp. 608-12.
- Stanley, A., S. Seitz, P. Way, et al. 1991. "The United States Interagency Working Group Approach: The IWG Model for the Heterosexual Spread of HIV and the Demographic Impact of the AIDS Epidemic." Chapter XIII in The AIDS Epidemic and its Demographic Consequences. United Nations Department of International Economic and Social Affairs, ST/ESA/SER.A/119, New York.
- Torrey B., M. Mulligan, and P. Way. 1990. "Blood Donors and AIDS in Africa: The Gift Relationship Revisited." U.S. Bureau of the Census, Center for International Research, Staff Paper No. 53.

U.S. Bureau of the Census. Forthcoming. World Population Profile: 1994, by Ellen Jamison and Frank B. Hobbs.

Valleroy, L., J. Harris, and P. Way. "The Impact of HIV-1 Infection on Child Survival in the Developing World." AIDS, Vol. 4, No. 7, pp. 667-72.

Wasserheit, J. 1990. "Epidemiological Synergy: Inter-relationships between HIV Infection and Other STDs." Paper prepared for the International Workshop on AIDS and Reproductive Health, Bellagio, Italy, October 29-November 2, 1990.

Way, P. and K. Stanecki. 1991. "The Demographic Impact of an AIDS Epidemic on an African Country: Application of the iwgAIDS Model." U.S. Bureau of the Census Center for International Research, Working Paper No. 58.

World Health Organization (WHO). 1993. WHO estimate of HIV infection tops 14 million. Global Programme on AIDS, Press Release WHO/38, 21 May 1993, Geneva.

Sources for Figures

Figure 1

- A0071 Ahemd, S. M., E. H. H. M. Kheir, 1990, Sudanese Sexual Behaviour in the Context of Socio-Cultural Norms and the Transmission of HIV, *Anthropological Studies Relevant to the Sexual Transmission of HIV*, Sonderborg, Denmark, 11/19-22.
- B0132 Bigot, A., M. Bodeus, G. Burtonboy, 1992, Prevalence of HIV Infection among Prostitutes in Benin (West Africa), *Journal of Acquired Immune Deficiency Syndromes*, vol. 5, no. 3, pp. 317-319.
- C0122 Corwin, A. L., J. G. Olson, M. A. Omar, et al., 1991, HIV-1 in Somalia: Prevalence and Knowledge among Prostitutes, *AIDS*, vol. 5, no. 7, pp. 902-904.
- C0141 Couzineau, B., J. Bouloumie, P. Hovette, et al., 1991, Prevalence of HIV Infection in a Target Population in the Republic of Djibouti, *Medecine Tropicale*, vol. 51, no. 4, pp. 485-486.
- D0105 Diaw, I., T. Siby, I. Thior, et al., 1992, HIV and STD Infections among Newly Registered Prostitutes in Dakar, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PoC 4333.
- D0120 Dada, A. J., F. Oyewole, R. Onofowokan, et al., 1993, Lagos, Nigeria-New Delhi, India HIV-1 Connection among High Class Prostitutes, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C07-2744.
- F0041 Fofana, O., A. D. Cissoko, M. D. Bocoum, et al., 1991, Infection MST dans un Echantillon de 103 Prostituees, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster W.A.150.
- G0005 Gurtler, L., J. Eberle, F. Deinhardt, et al., 1987, Prevalence of HIV-1 in Selected Populations of Areas in Malawi, II International Symposium: AIDS and Associated Cancers in Africa, Naples, Italy, 10/7-9, Abstract TH-44.
- L0056 Lesbordes, J. L., C. Pichoud, L. Vitvitski, et al., 1989, Les Marqueurs des Hepatites a VHB et VHD Facteurs de Risque de l'Infection a VIH et du Sida a Bangui, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 178.
- M0018 Mingle, J. A. A., M. Hayami, M. Osei-Kwasi, et al., 1987, Reactivity of Ghanaian Sera to Human Immunodeficiency Virus, (HIV) and Simian T-Lymphotropic Virus III (STLV-III), III International Conference on AIDS, Washington, D.C., 6/1-5, Abstract MP.94.
- M0032 M'Pele, P., A. Itoua-Ngaporo, M. Rosenhelm, et al., 1987, HIV Antibodies in Prostitutes, Brazzaville and Pointe Noire (Congo), II International Symposium: AIDS and Associated Cancers in Africa, Naples, Italy, 10/7-9, Abstract TH-30.
- M0050 Mhalu, F. S., J. F. Shao, U. Bredberg Raden, et al., 1988, Rising Prevalence of HIV Infection and General Attitude to Condom Utilisation among Restaurant and Bar Workers in Dar es Salaam, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Abstract PS 7.3.
- M0243 Hungai, J. N., J. Ombette, J. Kimani, et al., 1992, Laboratory Findings for the Prevalence of HIV, Neisseria Gonorrhoea and Chlamydia Trachomatis Infections among Prostitutes ..., VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Abstract W.P.189.
- M0265 Minister of Public Health, 1993, Serosurveillance Report of HIV Infection, Republic of Zaire, National Control Programme Against AIDS, Central Coordination Bureau, BCC/SIDA, Official Report.
- M0272 Monny-Lobe, M., M. Ella, V. Ngoumou, et al., 1993, A Comparative HIV Seroprevalence Study among CSWs in Yaounde and Douala - Cameroon, IX International Conference on AIDS, Berlin, 6/6-11, Abstract PO-C31-3300.
- N0032 Naucier, A., P-A. Andreasson, C. M. Costa, et al., 1989, HIV-2 Associated AIDS and HIV-2 Seroprevalence in Bissau, Guinea-Bissau, *Journal of Acquired Immune Deficiency Syndromes*, vol. 2, no. 1, pp. 88-93.
- N0083 NACP/MOH (Ethiopia), 1992, Surveillance and Research Activities on HIV/AIDS: Activities Accomplished So Far in Ethiopia, 1984-1991, Ethiopia NACP/MOH data, unpublished report.
- O0044 Ousseini, H., J. L. Pecarrere, D. Meynard, et al., 1991, Evolution de la Seroprevalence des Infections a VIH1 et VIH2 a l'Hopital National de Niamey, Niger, *Bulletin de la Societe de Pathologie Exotique*, vol. 84, no. 3, pp. 235-239.

- P0062 Pepin, J., G. Morgan, D. Dunn, et al., 1991, HIV-2-Induced Immunosuppression among Asymptomatic West African Prostitutes: Evidence that HIV-2 is Pathogenic, but less so ..., *AIDS*, vol. 5, no. 10, pp. 1165-1172.
- S0077 Sangare, L., J. L. Sankale, C. S. Boye, et al., 1989, Infection of HIV-1, HIV-2, HBV and Treponeme Pale in a Population of Prostitutes in Ouagadougou, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct 18-20, Poster 071.
- T0085 Traore-Ettiegne, V., P. D. Ghys, M. O. Diallo, et al., 1993, High Prevalence of HIV Infections and Other STD in Female Prostitutes in Abidjan, IX International Conference on AIDS, Berlin, 6/6-11, Session WS-C08-3.

Figure 2

- A0012 Ayeahunie, S., D. Zewde, F. Ketema, et al., 1988, Seropositivity to HIV-1 Antibodies in Addis Ababa, Ethiopia, IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5044.
- C0006 Crespi, M., B. D. Schoub, S. F. Lyons, et al., 1987, Perspective of AIDS in South Africa, II International Symposium: AIDS and Associated Cancers in Africa, Naples, Italy, 10/7-9, Poster TH-45.
- C0109 Chikwem, J. O., I. Mohammed, H. G. Bwala, et al., 1990, Human Immunodeficiency Virus (HIV) Infection in Patients Attending a Sexually Transmitted Diseases Clinic in Borno State of ..., *Tropical and Geographical Medicine*, vol. 42, pp. 17-22.
- D0389 Doorly, R., A. Kadio, K. Brattegaard, et al., 1991, Trends in HIV-1 and HIV-2 Infections in Abidjan, Cote d'Ivoire, 1987-1990, VII International Conference on AIDS, Florence, Italy, 6/16-21, Session M.C.42.
- HC055 Harry, T. O., W. Gashau, O. Ekenna, et al., 1990, Growing Threat of HIV Infection in a Low Prevalence Area, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.21.
- H0061 Herald, The, 1991, One in Six Expectant Mothers HIV Positive, *The Herald Newspaper*, Thursday, March 21, p. 1.
- K0142 Kimani, J., I. Mclean, G. Maitha, et al., 1992, An Activated Charcoal Medium in the Primary Isolation of *M. Ducreyi*, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Abstract W.P.197.
- M0096 Mhalu, F., U. Bredberg-Raden, E. Mbena, et al., 1987, Prevalence of HIV Infection in Healthy Subjects and Groups of Patients in Tanzania, *AIDS*, vol. 1, no. 4, pp. 217-221.
- M0146 Mefane, C., D. Benoni, M. Guerch, et al., 1989, Seroprevalence des Infections a Retrovirus Humains a Libreville (Gabon), *Medecine d'Afrique Noire*, vol. 36, no. 6, pp. 491-496.
- M0249 Mwakagile, D. S. M., A. B. M. Swai, K. J. Pallangyo, et al., 1992, Trend of Anogenital Warts among Patients Seen at a Referral Clinic for Sexually Transmitted Diseases in Dar es Salaam, Tanzania, VII International Conference AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster W.P.190.
- M0261 Martin, D. J., B. D. Schoub, G. N. Padayachee, et al., 1990, One Year Surveillance of HIV-1 Infection in Johannesburg, South Africa, *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 84, pp. 728-730.
- P0024 Piot, P., F. A. Plummer, M. A. Rey, et al., 1987, Retrospective Seroepidemiology of AIDS Virus Infection in Nairobi Populations, *Journal of Infectious Diseases*, vol. 155, no. 6, pp. 1108-1112.
- R0065 RSA Department of National Health and Population Development, 1991, AIDS in South Africa: Status on 30 June 1991, *Epidemiological Comments*, vol. 18, no. 11, pp. 229-249.
- S0046 Simonsen, J. W., W. Cameron, M. M. Gakinya, et al., 1988, Human Immunodeficiency Virus Infection among Men with Sexually Transmitted Diseases, *New England Journal of Medicine*, vol. 319, no. 5, pp. 274-278.
- S0111 Schoub, B. D., A. M. Smith, S. Johnson, et al., 1990, Consideration on the Further Expansion of the AIDS Epidemic in South Africa - 1990, *South African Medical Journal*, vol. 77, pp. 613-618.
- T0049 Tyndall, M., P. Odhiambo, A. R. Ronald, et al., 1991, The Increasing Seroprevalence of HIV-1 in Males with Other STD's in Nairobi, Kenya, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster W.C.311.
- T0078 Traore-Ettiegne, V., M. O. Diallo, A. Amouzou, et al., 1992, Trends in HIV-1 and HIV-2 Infections among Patients attending an Abidjan Sexually Transmitted Diseases Clinic, 1990-1992, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.027.

20011 Zewdie, D., M. Abdurahman, S. Ayhunie, et al., 1989, High Prevalence of H¹V-1 Antibodies in STD Patients with Genital Ulcers, V International Conference on AIDS, Montreal, 6/4-9, Poster T.A.P. 102.

Figure 3

- G0061 Gresenguet, G., L. Belec, P. M. V. Martin, et al., 1991, Seroprevalence de l'Infection à VIH1 au Sein des Consultants de la Clinique des Maladies Sexuellement Transmissibles de ..., Bulletin de la Societe de Pathologie Exotique, vol. 84, no. 3, pp. 240-246.
- H0066 Hellmann, M. S., S. Desmond-Hellman, P. S. J. Nsubuga, et al., 1991, Genital Trauma During Sex is a Risk Factor for HIV Infection in Uganda, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster M.C.3079.
- H0068 Hira, S., J. Kamanga, G. Tembo, et al., 1991, Control Strategies in STD/HIV Clinic in Zambia: a Demonstration Project, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster W.C.3082.
- K0127 Karita, E., P. Van de Perre, A. Nziyumvira, et al., 1992, HIV Seroprevalence among STD Patients in Kigali, Rwanda, during the Four-Year Period 1988-1991, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4468.
- H0183 Mwakagile, D. S. M., A. B. M. Swai, S. Mwambinga, et al., 1991, Socio-Epidemiological and Microbiological Aspects of Sexually Transmitted Diseases and HIV Infection in Dar es Salaam, Tanzania, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Abstract W.A.144.
- N0100 Ndinya-Achola, J. O., A. E. Ghee, K. K. Holmes, et al., 1993, Gender-Specific Sexual Behaviors among STD Patients at a Nairobi Primary Health Care Clinic, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-D01-3406.
- R0065 RSA Department of National Health and Population Development, 1991, AIDS in South Africa: Status on World AIDS Day 1991, Epidemiological Comments, vol. 18, no. 11, pp. 229-249.
- 20011 Zewdie, D., M. Abdurahman, S. Ayhunie, et al., 1989, High Prevalence of HIV-1 Antibodies in STD Patients with Genital Ulcers, V International Conference on AIDS, Montreal, 6/4-9, Poster T.A.P. 102.

Figure 4

- 03703 U.S. Department of State, 1993, AIDS/HIV in Malawi - A Status Report, Unclassified cable, 8/93, Lilongwe 03703.
- A0086 Asimwe, G., G. Tembo, W. Naamara, et al., 1992, AIDS Surveillance Report: June 1992, Ministry of Health, AIDS Control Programme: Surveillance Unit, Entebbe, Uganda, unpublished report.
- 80093 Behets, F., K. Bishagara, A. Disasi, et al., 1992, Diagnosis of HIV Infection with Instrument-Free Assays as an Alternative to ELISA and Western Blot Testing: An Evaluation..., Journal of Acquired Immune Deficiency Syndromes, vol 5, no. 9, pp. 878-882.
- B0122 Brattegaard, K., R. Doorly, J. Kouadio, et al., 1991, Alternative Screening and Supplement Testing Strategies for HIV-1 and HIV-2 Infections, VII International Conference on AIDS, Florence, Italy, 6/16-21, Abstract M.C.88.
- C0038 Carswell, J. W., 1987, HIV Infection in Healthy Persons in Uganda, AIDS, vol. 1, no. 4, pp. 223-227.
- D0030 Denis, F., G. Gershy-Damet, M. Lhuillier, et al., 1987, Prevalence of Human T-Lymphotropic Retroviruses Type III (HIV) and Type IV in Ivory Coast, Lancet, February 21, vol. 1, pp. 408-411.
- D0112 Diallo, M. G., V. Traore, M. Maran, et al., 1992, Sexually Transmitted Diseases and HIV-1/HIV-2 Infections among Pregnant Women Attending Antenatal Clinic in Abidjan, Cote d'Ivoire, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.041.
- E0023 Ekpini, R. A., G. Adjorlolo, T. Sibailly, et al., 1991, Prospective Study of HIV-1 and HIV-2 Mother-to-Child Transmission, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster M.A.247.
- G0059 Georges, A. J., M. C. Georges-Courbot, P. M. V. Martin, et al., 1989, Infection and Morbidity due to HIV in Central African Republic, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 077.
- G0105 Gichangi, P., M. Temmerman, A. F. Mohamed, et al., 1992, Rapid Increase in HIV-1 Infection and Syphilis between 1989 and 1991 in Pregnant Women in Nairobi, Kenya, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4029.
- H0028 Hira, S., G. Bhat, J. Kamanga, et al., 1989, Perinatal Transmission of HIV-1 in Lusaka, Zambia, British Medical Journal, vol. 299, no. 6718, pp. 1250-1252.

- J0001 Johns Hopkins University, 1986, AIDS -- A Public Health Crisis, Population Information Program, Population Reports, Issues in World Health, July-Aug., Series L, no. 6, pp. 194-228.
- L0063 Luyeye, M., M. Gerniers, M. Lebughe, et al., 1990, Prevalence et Facteurs de Risque Pour les MST Chez Les Femmes Enceintes dans Les Soins de Sante Primaires a Kinshasa, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.C.8.
- M0108 Mmiro, F., C. Ndugwa, P. Kataaha, et al., 1989, HIV Infection and Pregnancy in Mulago Hospital: Preliminary Data, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 160.
- M0149 Maitha, G. M., J. M. Simwa, F. A. Plummer, 1990, HIV Seroprevalence among High Risk and Low Risk Groups in Nairobi during the Period May 1989 Through May 1990, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.20.
- M0265 Minister of Public Health, 1993, Serosurveillance Report of HIV Infection, Republic of Zaire, National Control Programme Against AIDS, Central Coordination Bureau, BCC/SIDA, Official Report.
- N0048 Naamara, W., S. Berkley, R. Downing, et al., 1989, Sentinel Surveillance for HIV Infection in a Kampala Antenatal Clinic, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 019.
- N0068 Ndinya-Achola, J. O., P. Datta, J. Embree, et al., 1991, Increasing Seroprevalence (SP) of HIV-1 in Pregnant Women in Nairobi, 1986-1990., VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster W.C.3264.
- N0087 NACP, 1992, Report on the First HIV Sentinel Surveillance in Botswana, July, Unpublished Report.
- O0004 Odehouri, K., K. M. DeCock, J. W. Krebs, et al., 1989, HIV-1 and HIV-2 Associated with AIDS in Abidjan, Cote d'Ivoire, AIDS, vol 3, no. 8, pp. 509-512.
- P0024 Piot, P., F. A. Plummer, M. A. Rey, et al., 1987, Retrospective Seroepidemiology of AIDS Virus Infection in Nairobi Populations, Journal of Infectious Diseases, vol. 155, no. 6, pp. 1108-1112.
- R0021 Ryder, R. W., W. Nsa, S. E. Hassig, et al., 1989, Perinatal Transmission of the Human Immunodeficiency Virus Type 1 to Infants of Seropositive Women in Zaire, New England Journal Medicine, vol. 320, no. 25, pp. 1637-1642.
- S0069 Scasse, P., A. J. Georges, R. M. Siopathis, et al., 1989, Les Aspects Epidemiologiques des Affections Liees Aux Virus 1 et 2 en Republique Centrafricaine, V International Conference on AIDS, Montreal, 6/4-9, Poster W.G.O. 28.
- T0040 Tembo, G., E. Van Praag, H. Mutambo, et al., 1990, Sentinel Surveillance of HIV Infection in Zambia, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.28.
- T0053 Twa-Twa, J., G. Tembo, G. Asiimwe, et al., 1991, AIDS Surveillance Report (First and Second Quarter) for the Year 1991, Ministry of Health, AIDS Control Programme Surveillance Unit, Entebbe, Uganda, unpublished report.
- T0057 Temmerman, M., F. M. Ali, J. O. Ndinya-Achola, et al., 1991, Rapid Increase of both HIV-1 and Syphilis among Pregnant Women in Nairobi, Kenya, AIDS, vol. 6, no. 10, pp. 1118-1185.
- W0069 World Health Organization, 1991, Global Programme on AIDS, Weekly Epidemiological Record, vol. 66, no. 35, pp. 257-259.

Figure 5

- W0050 Watson-Williams, E. J., P. Kataaha, P. Ssenyonga, et al., 1991, Development of Uganda Blood Transfusion Service. Sept. 1988 - Jan. 1991, VII International Conference on AIDS, Florence, Italy, 6/16-21, Poster W.D.4089.

Figure 6

- S0142 Schutz, R., M. Kone, D. Savarit, et al., 1991, Identification des Groupes a Risque Sida dans la Population des Donneurs de Sang D'Abidjan, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster M.A.255.

Figure 7

- W0056 Wawer, M. J., D. Serwadda, S. D. Musgrave, et al., 1993, Dynamics of Spread of HIV-1 Infection in a Rural District of Uganda, British Medical Journal, vol. 303, no. 6813, pp. 1303-1306.

Figure 8

03703 U.S. Department of State, 1993, AIDS/HIV in Malawi - A Status Report, Unclassified cable, 8/93, Lilongwe 03703.

A0042 Andreasson, P. A., F. Dias, J. M. Teixeira Goudiaby, et al., 1989, HIV-2 Infection in Prenatal Women and Vertical Transmission of HIV-2 in Guinea-Bissau, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 052.

A0046 Andrade, D., L. Leite, S. Theobald, et al., 1989, Taux de Seroprevalence des Anticorps Anti-HIV dans les iles du Cap Vert: Etude par Sondage en Grappe, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Abstract 047.

A0071 Ahemd, S. M., E. H. H. M. Kheir, 1990, Sudanese Sexual Behaviour in the Context of Socio-Cultural Norms and the Transmission of HIV, Anthropological Studies Relevant to the Sexual Transmission of HIV, Sonderborg, Denmark, 11/19-22.

A0086 Asimwe, G., G. Tembo, W. Naamara, et al., 1992, AIDS Surveillance Report: June 1992, Ministry of Health, AIDS Control Programme Surveillance Unit, Entebbe, Uganda, unpublished report.

A0101 Asagba, A. O., J. J. Andy, T. Ayele, et al., 1992, HIV Sentinel Surveillance in Nigeria, Nigeria Bulletin of Epidemiology, vol. 2, no. 2, pp. 10-13.

B0037 Bailly, C., M. Santiago, M. Abbate, et al., 1988, Situation in Djibouti: Sero Epidemiological Survey, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster.

B0127 Bazabana, M., J. C. Loukaka, P. M'Pele, et al., 1991, Tendence de l'Infection a VIH chez les Femmes Encientes au Congo, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster M.A.268.

B0169 Ben Salem, M., M. Ben Rachid, C. Hankins, et al., 1993, STD/HIV Seroprevalence among Women Attending an Antenatal Clinic in Tunis, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C09-2792.

B0174 Buzingo, T., Y. Alexandre, A. Kamuragiye, et al., 1993, The Epidemiology of HIV and AIDS in Burundi, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-C07-2750.

C0093 Coulibaly, Y. M., J. L. Sankale, A. Gueye, et al., 1989, HIV-1 and HIV-2 in Mauritania, IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Abstract 028.

D0020 De la Cruz, F., J. Barreto, C. Palma de Sousa et al., 1988, Seroepidemiological Study on HIV-1 and HIV-2 Prevalence in Mozambican General Population - 1987, IV International Confernece on AIDS, Stockholm, 6/13-14, Poster 5056.

D0112 Diallo, M. O., V. Traore, M. Maran, et al., 1992, Sexually Transmitted Diseases and HIV-1/HIV-2 Infections among Pregnant Women Attending Antenatal Clinic in Abidjan, Cote ..., VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.041.

D0113 Diouf, A., N. G. Mbaye, F. Kebe, et al., 1992, Infections a VIH et Perinatalite a Dakar, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.223.

D0114 Davo, N., C. Adjovii, S. Anagonou, et al., 1992, Approche de l'Epidemie VIH/SIDA au Benin, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.018.

F0007 Freeman, C. P., E. K. Kollie, L. H. Reithner, et al., 1988, Microeliza HIV Antibody Testing in Two Areas of Liberia West Africa, IV International Conference on AIDS, Stockholm, 6/13-14, Poster 5017.

G0091 Glasuddin, A. S. M., M. M. Ziu, I. A. Shaafie, et al., 1991, Brucella and HIV-1 Antibodies in Libyan Blood Donors, Journal of Infection, vol. 22, no. 3, pp. 294-296.

G0105 Gichangi, P., M. Temmerman, A. F. Mohamed, et al., 1992, Rapid Increase in HIV-1 Infection and Syphilis between 1989 and 1991 in Pregnant Women in Nairobi, Kenya, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster PoC 4029.

G0112 Garcia-Calleja, J. M., L. Zekeng, S. Abbenyi, et al., 1992, Validation of the Results Found in Pregnant Women Sentinel Site for HIV Infection in Yaounde, Cameroon, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.037.

H0046 Hailu, K., B. Desta, D. Zewdie, 1990, Prevalence of HIV-1 Antibodies in Pregnant Women in Addis Ababa, Ethiopia, VI International Conference on AIDS, San Francisco, 6/20-24, Abstract 3154.

- H0086 Hasan, M., D. Barsoum, 1992, Acceptability of Screening for HIV Infection among Women Attending Family Planning Clinics in Cairo, Egypt, VIII International Conference on AIDS, Amsterdam, 7/19-24, Abstract PoD 5143.
- J0009 Josse, R., E. Delaporte, A. Trebuco, et al., 1988, Seroepidemiological Survey of HIV Infection in Equatorial Guinea, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster TP 12.
- K0026 Kam, C. C., T. Schwarz, B. C. Dando, et al., 1988, Prevalence of HIV1 in Mauritius, IV International Conference on AIDS, Stockholm, 6/15-16, Poster 5520.
- K0040 Kosia, A., T. Kargbo, E. Makiu, et al., 1989, Prevalence of HIV-I and HIV-II among Blood Donors in Sierra, Leon IV Internat. Conf.: AIDS and Assoc. Cancers in Africa, Marseille, Oct. 18-20, Poster 390.
- K0074 Kourouma, K., K. Kaba, L. Koivogui, 1990, Seroprevalence de l'Infection a VIH Chez les Donneurs de Sang a Conakou, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.6.
- K0076 Kirsch, T., A. J. Rasamindrakotkora, U. Hof, et al., 1990, Introduction of a Nationwide HIV Sentinel Surveillance System in Madagascar, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.17.
- K0125 Kapiga, S., D. J. Hunter, J. F. Shao, et al., 1992, Contraceptive Practice and HIV-1 Infection among Family Planning Clients in Dar es Salaam, Tanzania, VIII International Conference on AIDS, Amsterdam, 7/19-24, Poster 4343.
- L0022 Lopes Martins, J., W. F. Canas Ferreira, E. Prieto, et al., 1988, Study of HIV-1 and HIV-2 Infection in Sao Tom Island, III International Conference: AIDS and Associated Cancers in Africa, Sept. 14-16, Poster TP 5.
- L0040 Lecatsas, G., J. J. Joubert, C. H. J. Schutte, et al., 1988, HIV Seropositivity in East Caprivi, SEA/Namibia, South African Medical Journal, vol. 74, pp. 590-591.
- L0119 Ladner, J., A. De Clercq, M. Nyiraziraje, et al., 1993, HIV Seroprevalence and Counselling in Pregnant Women a Cohort Study in Kigali (Rwanda), 1992, IX International Conference on AIDS, Berlin, 6/6-11, Poster PO-D15-3884.
- M0143 Mingle, J., M. Osei-Kwesi, P. Antwi, et al., 1990, HIV-1 and HIV-2 Seroprevalence in Three Population Groups in Ghana, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.5.
- M0146 Mefane, C., D. Benoni, M. Guerch, et al., 1989, Seroprevalence des Infections a Retrovirus Humains a Libreville (Gabon), Medecine d'Afrique Noire, vol. 36, no. 6, pp. 491-496.
- M0241 Mahomed, K., J. Kasule, D. Makuyana, et al., 1991, Seroprevalence of HIV Infection amongst Antenatal Women in Greater Harare, Zimbabwe, Central African Journal of Medicine, vol. 37, no. 10, pp. 322-325.
- M0247 Maiga, M. K., H. A. Sangho, S. Fongoro, 1992, Transmission Materno-Foetale du Sida au Mali, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Abstract T.P.220.
- M0265 Minister of Public Health, 1993, Serosurveillance Report of HIV Infection, Republic of Zaire, National Control Programme Against AIDS, Central Coordination Bureau, BCC/SIDA, Official Report.
- M0246 Ministry of Public Health & Social Affairs, 1992, WHO Report on AIDS Surveillance, SFI/GPA/WHO/11.8, Official Report.
- M0267 Ministry of Health Kingdom of Lesotho, 1993, HIV Prevalence data, In: Update on HIV/AIDS in Lesotho, Disease Control and Environmental Health Division, WHO, March 1993, pp. 8-10.
- N0097 Namboze, J. M., 1993, AIDS/HIV Update - Botswana, WHO/Botswana, unpublished memo.
- O0044 Ousseini, H., J. L. Pecarrere, D. Meynard, et al., 1991, Evolution de la Seroprevalence des Infections a VIH1 et VIH2 a l'Hopital National de Niamey, Niger, Bulletin de la Societe de Pathologie Exotique, vol. 84, no. 3, pp. 235-239.
- P0103 Procupet, A., L. Fernandes, C. Lemos, 1992, Seroprevalence du VIH chez les Donneurs de Sang de Onze Provinces de la Republique d'Angola, VII International Conference on AIDS in Africa, Yaounde, Cameroon, 12/8-11, Poster T.P.11.
- R0089 RSA Dept. of National Health and Population Development, 1993, Third National HIV Survey of Women Attending Antenatal Clinics, South Africa, October/November 1992, Epidemiological Comments, vol. 20, no. 3, pp. 35-50.
- S0145 Sangare, L., M. Luki, K. Travers, et al., 1991, Infections a VIH chez les Femmes Enceintes a Bobo-Dioulasso (Burkina-Faso), VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Poster M.A.286.
- T0040 Tembo, G., E. Van Praag, H. Mutambo, et al., 1990, Sentinel Surveillance of HIV Infection in Zambia, V International Conference: AIDS in Africa, Kinshasa, Zaire, Oct. 10-12, Poster T.P.E.28.

- W0027 Wilkins, A., R. Hayes, P. Alonso, et al., 1991, Risk Factors for HIV-2 Infection in the Gambia, AIDS, vol. 5, no. 9, pp. 1127-1132.
- W0060 Whiteside, A., 1992, An Evaluation of the Likely Impact of AIDS on the Mananga Medical Service Subscribing Companies, Draft Report, pp. 1-12.
- W0069 World Health Organization, 1991, Global Programme on AIDS, Weekly Epidemiological Record, vol. 66, no. 35, pp. 257-259.
- Z0022 Zahraoui, M., F. Denis, K. Marhoum, et al., 1991, Etude de la Seroprevalence des Virus HTLV-1, HIV-1, HIV-2 et Herpes 6 Virus (HHV6) au Maroc, VI International Conference on AIDS in Africa, Dakar, Senegal, 12/16-19, Abstract T.A.143.

Figure 9

U.S. Bureau of the Census, Center for International Research.

Figure 10

U.S. Bureau of the Census, Center for International Research.

Figure 11

U.S. Bureau of the Census, Center for International Research.

46
58

CENTER FOR INTERNATIONAL RESEARCH
STAFF PAPERS

CENTER FOR INTERNATIONAL RESEARCH

STAFF PAPERS

- | | | |
|--------|--|-----------------|
| No. 72 | An Epidemiological Review of HIV/AIDS in Sub-Saharan Africa, by Peter O. Way and Karen A. Stanecki (1994) | \$ 10.00 |
| No. 71 | China's Export Production Profile, by Penelope B. Prime (1994) | \$ 10.00 |
| No. 70 | Population and Migration Characteristics of Fujian Province, China, by Judith Banister, Christina Wu Harbaugh, and Ellen Jamison (1993) | \$ 10.00 |
| No. 69 | Reform of China's Foreign Trade System and Prospects for Freer Trade, by Loraine A. West (1993) | \$ 10.00 |
| No. 68 | Scientists and Engineers in Industrialized Societies: Data Available as of 1992, by Ellen Jamison (1992) | \$ 15.00 |
| No. 67 | Problems and Options in China's Public Finance, by Penelope Prime (1992) | \$ 10.00 |
| No. 66 | Excess Mortality in Guatemala: A Comparison of Causes of Death in Guatemala and Costa Rica, by Arjun Adlakha and Eduardo Arriaga (1992) | \$ 5.00 |
| No. 65 | Vietnam--Population and Dynamics, by Judith Banister (1992) | \$ 10.00 |
| No. 64 | Scientists and Engineers in Canada and Sweden, by Ellen Jamison (1991) | \$ 10.00 |
| No. 63 | Scientists and Engineers in Industrialized Countries: An Update for France, West Germany, and the United Kingdom, by Ellen Jamison (1991) | \$ 10.00 |
| No. 62 | Scientists and Engineers in Malaysia, South Korea, and Taiwan, by Ellen Jamison (1991) | \$ 10.00 |
| No. 61 | A Selected Bibliography on Urbanization in China, by Florence Yuan (1991) | \$ 15.00 |
| No. 60 | USSR: Gross National Product Accounts, 1985, by Misha Belkindas, Douglas Diamond, and Albina Tretyakova (1991) | \$ 15.00 |

No. 59	Dollar GNP Estimates for China, by Jeffrey R. Taylor (1991)	\$ 10.00
No. 58	The Demographic Impact of an AIDS Epidemic on an African Country: Application of the iwgAIDS Model, by Peter O. Way and Karen Stanecki (1991)	\$ 10.00
No. 57	Determinants of Unauthorized Migration to the United States, by Linda S. Peterson and Robert Warren (1990)	\$ 5.00
No. 56	The Modernization of the Soviet Agricultural Machine-Building Industry, by David Zaslow (1990)	\$ 10.00
No. 55	Seroprevalence of HIV in Africa: Winter 1990, by Barbara Boyle Torrey and Peter O. Way (1990)	\$ 10.00
No. 54	Estimates and Projections of Educational Attainment in the USSR to the Year 2000, by W. Ward Kingkade (1990)	\$ 10.00
No. 53	Blood Donors and AIDS in Africa: The Gift Relationship Revisited, by Barbara Boyle Torrey, Maurita Mulligan, and Peter O. Way (1990)	\$ 10.00
No. 52	Living Arrangements of the Elderly and Social Policy: A Cross-National Perspective, by Kevin G. Kinsella (1990)	\$ 10.00
No. 51	Updated Statistics on Scientists and Engineers in Industrialized Countries, by Ellen Jamison (1989)	\$ 10.00
No. 50	Labor Force and Informal Employment in Mexico: Recent Characteristics and Trends, by Linda S. Peterson (1989)	\$ 10.00
No. 49	China: The Problem of Employing Surplus Rural Labor, by Jeffrey R. Taylor and Judith Banister (1989)	\$ 10.00
No. 48	USSR: The Belorussian Railroad Experiment, by Meredith M. Sample Heinemeier (1989)	\$ 10.00
No. 47	Mexico's Total, Employed, and Excess Labor Force: Future Prospects, 1985 to 2000, by Frank B. Hobbs (1989)	\$ 10.00
No. 46	Forecasting the Long-Range Planning of Science and Technology in the USSR, by Louvan E. Nolting (1989)	\$ 10.00
No. 45	Estimates and Projections of the Labor Force and Civilian Employment in the USSR: 1950 to 2000, by Stephen Rapawy and W. Ward Kingkade (1988)	\$ 10.00
No. 44	Implications of the Aging of China's Population, by Judith Banister (1988)	\$ 5.00

- No. 43 **Management and Financing of Research, Development, and Innovation in the Soviet Electrotechnical Industry**, by Louvan E. Nolting (1988) \$ 10.00
- No. 42 **Bibliography of Soviet Statistical Handbooks**, by Timothy E. Heleniak (1988) [updated version of Staff Paper No. 3] \$ 15.00
- No. 41 **USSR: Estimates and Projections of the Population by Major Nationality, 1979 to 2050**, by W. Ward Kingkade (1988) \$ 10.00
- No. 40 **Family Planning in China: Recent Trends**, by Karen Hardee-Cleaveland and Judith Banister (1988) \$ 10.00
- No. 39 **Indonesia: An Overview of Selected Socioeconomic Subjects**, by Kathleen Short (1988) \$ 10.00
- No. 38 **The Soviet View on the State of Technological Innovation in the USSR**, by Louvan E. Nolting (1988) \$ 10.00
- No. 37 **USSR: The Brigade System of Labor Organization and Incentives in Industry and Construction**, by Meredith M. Heinemeier (1988) \$ 5.00
- No. 36 **USSR: Trends in Fuel and Energy Consumption by Sector and Fuel, 1970-1980**, by Matthew J. Sagers and Albina Tretyakova (1988) \$ 10.00
- No. 35 **Aging in the Third World**, by Kevin G. Kinsella (1988) \$ 10.00
- No. 34 **Afghanistan: A Demographic Profile**, by Frank B. Hobbs (1988) \$ 10.00
- No. 33 **Estimates and Projections of the Population of the USSR: 1979 to 2025**, by W. Ward Kingkade (1987) \$ 10.00
- No. 32 **USSR: Motor Fuel Use and Conservation in Transportation and Agriculture, 1970 to 1984**, by Albina Tretyakova and Barry Kostinsky (1987) \$ 10.00
- No. 31 **China: Consumer Demand Statistical Update**, by Jeffrey R. Taylor (1987) \$ 15.00
- No. 30 **USSR: Energy Consumption in the Housing and Municipal Sector**, by Matthew J. Sagers and Albina Tretyakova (1987) \$ 10.00
- No. 29 **USSR: Energy Consumption in the Chemical, Petrochemical, and Petroleum Refining Industries**, by Matthew J. Sagers and Albina Tretyakova (1987) \$ 5.00
- No. 28 **Fuel and Energy Use in the Soviet Metallurgy Industries**, by Matthew J. Sagers and Albina Tretyakova (1987) \$ 10.00

No. 27	Future Implications of Alternative Family Planning Policies in China , by John S. Aird (1986)	\$ 5.00
No. 26	Scientists and Engineers in Industrialized Countries: A Comparison of Characteristics for France, West Germany, Japan, the United Kingdom, and the United States , by Peter O. Way and Ellen Jamison (1986).....	\$ 15.00
No. 25	Central American Migration: Past and Present , by Linda S. Peterson (1986)	\$ 10.00
No. 24	A Bibliography of National Income Accounting in China , by Rebecca A. Hatch (1986)	\$ 5.00
No. 23	China: Recent Trends in Health and Mortality , by Judith Banister (1986)	\$ 10.00
No. 22	China's Price Structure in International Perspective , by Jeffrey R. Taylor (1986)	\$ 5.00
No. 21	Demographic Estimates, Projections, and Selected Social Characteristics of the Population of India , by Frank B. Hobbs (1986)	\$ 10.00
No. 20	Cost Estimates for the Soviet Oil Industry: 1970 to 1990 , by Albina Tretyakova and Meredith Heinemeier (1986)	\$ 10.00
No. 19	Cost Estimates for the Soviet Gas Industry: 1970 to 1990 , by Albina Tretyakova and Meredith Heinemeier (1986)	\$ 10.00
No. 18	Cost Estimates for the Soviet Coal Industry: 1970 to 1990 , by Albina Tretyakova and Meredith Heinemeier (1986)	\$ 10.00
No. 17	Soviet Foreign Trade in Foodstuffs: A Calorie Measure , by Vladimir G. Treml (1986)	\$ 10.00
No. 16	Employment Outlook for China to the Year 2000 , by Jeffrey R. Taylor (1986)	\$ 5.00
No. 15	Urban-Rural Population Projections for China , by Judith Banister (1986) Report only	\$ 10.00
	Report with medium projection printout	\$ 12.50
	Report with high, medium, and low projection printouts	\$ 16.50
No. 14	Natural Gas Liquids and the Soviet Gas Processing Industry , by Matthew J. Sagers (1986)	\$ 10.00
No. 13	1977 Consumption by Industrial Sector of the USSR , by Meredith Heinemeier (1986)	\$ 10.00

No. 11	The Freight Rate Structure on Soviet Railroads, by Matthew J. Sagers and Milford B. Green (1985)	\$ 5.00
No. 10	Civilian Employment in the USSR: 1950 to 1983, by Stephen Rapawy (1985)	\$ 5.00
No. 9	Evaluation of Selected Soviet Population Statistics, by W. Ward Kingkade (1985)	\$ 5.00
No. 8	Reestimation of Gross Value of Industrial Output by Branch of Production for the People's Republic of China, 1952-1957, by Jeffrey R. Taylor (1983)	\$ 5.00
No. 7	Components of Gross Investment in 1966 and 1972 Soviet Input-Output Tables, by James W. Gillula (1984)	\$ 5.00
No. 6	Issues and Implications of the Aging Japanese Population, by Peter O. Way (1984)	\$ 10.00
No. 5	A Compendium of Soviet Health Statistics, by Murray Feshbach (1985)	\$ 10.00
No. 4	Restructuring the Soviet Petroleum Refining Industry, by Matthew J. Sagers and Albina Tretyakova (1985)	\$ 10.00
No. 3	Bibliography of Regional Statistical Handbooks in the USSR, by Meredith M. Heinemeier (1984)	See SP No. 42
No. 2	Refinery Throughput in the USSR, by Matthew J. Sagers (1984)	\$ 10.00
No. 1	Construction of a 1977 Input-Output Table, by Dimitri M. Gallik, et al. (1984)	\$ 10.00