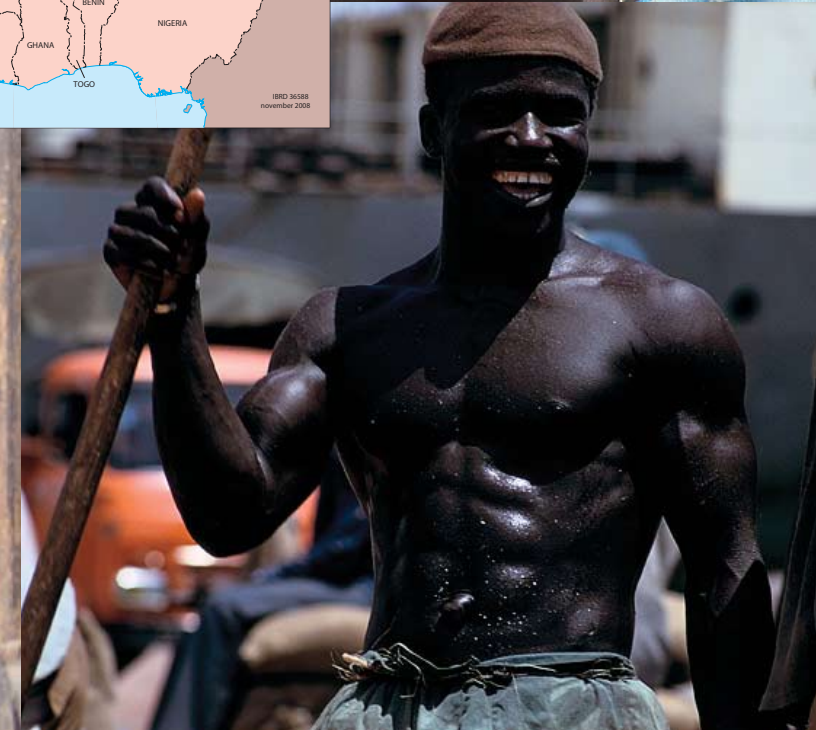
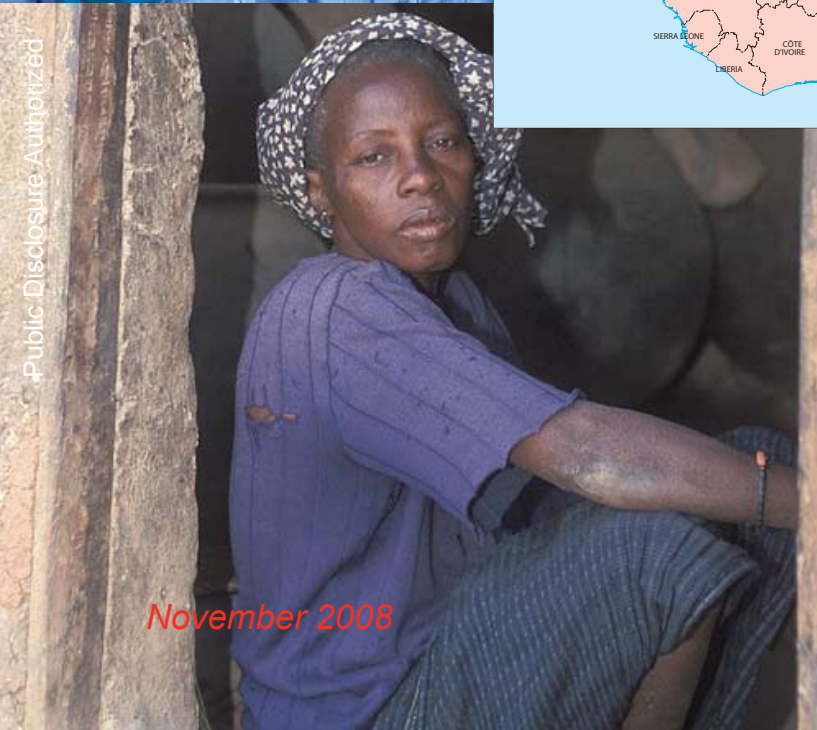




The Global HIV/AIDS Program
The World Bank
Global AIDS Monitoring and Evaluation Team (GAMET)



West Africa
HIV/AIDS Epidemiology and Response Synthesis
Implications for prevention



November 2008

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WEST AFRICA HIV/AIDS EPIDEMIOLOGY AND RESPONSE SYNTHESIS

**Characterisation of the HIV epidemic and response in West Africa:
Implications for prevention**

World Bank Global HIV/AIDS Program Report

November 2008

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West Africa HIV/AIDS Epidemiology and Response Synthesis

Characterisation of the HIV epidemic and response in West Africa: Implications for prevention

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This paper was written as part of the work program by the Global AIDS Monitoring and Evaluation Team (GAMET) to support countries to “know your epidemic, know your response”, to be able to develop effective HIV/AIDS responses that are results-focused, evidence-based, and where interventions are carefully chosen and prioritized based on a careful characterization of each country’s epidemic. The work was funded under the UNAIDS Unified Budget and Workplan, and carried out in partnership between the World Bank and UNAIDS.

Abstract: This synthesis paper analyses all available relevant data to carefully characterise the HIV epidemics in 15 West African countries, to gain an improved understanding of HIV transmission dynamics in this sub-region, assess the extent to which existing responses address these specific transmission dynamics, and recommend ways to improve the effectiveness of West Africa’s epidemic response.

Keywords: HIV/AIDS, HIV, AIDS, Epidemic, Response, Epidemiology, Burkina Faso, Benin, Côte d’Ivoire, Cape Verde, The Gambia, Guinea Bissau, Ghana, Guinea, Liberia, Mali, Nigeria, Niger, Sierra Leone, Senegal, Togo, World Bank, GAMET

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This synthesis of existing data and other information on the HIV/AIDS epidemics in fifteen countries of West Africa is part of the Global AIDS Monitoring and Evaluation Team (GAMET)'s work to support countries to better “know your epidemic”. A detailed and careful characterization of the epidemic, to understand the behaviors and groups that are giving rise to most new infections, is the crucial first step to being able to develop a results-focused, evidence-based response that will be effective in preventing new infections. Successful prevention makes it possible for countries to scale up treatment, care and mitigation efforts, towards achieving Universal Access to HIV/AIDS services for all who need them. We hope that this work will help HIV/AIDS decision makers “know your epidemic”, and also “know your response” and tailor the response closely to the epidemic, to be more effective in achieving results.

The work was done with the collaboration of the National AIDS Councils and AIDS programs of Burkina Faso, Benin, Côte d’Ivoire, Cape Verde, The Gambia, Guinea Bissau, Ghana, Guinea, Liberia, Mali, Nigeria, Niger, Sierra Leone, Senegal and Togo. Grateful thanks are due to all those who provided advice, documents, data and other help.

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Acronyms and Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AIS	AIDS Indicator Surveys
ANC	antenatal care
ART	antiretroviral therapy
BCC	Behavioural Change Communication
BSS	Behavioural Surveillance Survey
CIDA	Canadian International Development Agency
DHS	Demographic and Health Survey
DHS+	DHS with biological HIV testing for at least a sub-sample of respondents
DIST	STI dispensary (Dispensaire IST)
FSW	Female sex worker
GFATM	Global Fund to fight AIDS, Tuberculosis and Malaria
HAART	highly active antiretroviral therapy
HIV	Human Immunodeficiency Virus
IBBS	Integrated Biological and Behavioural Survey
IDU	Injection drug user/s
IEC	Information, Education and Communication
MAP	Multi-Country HIV/AIDS Program funded by the World Bank
MARP	most-at-risk population
M&E	Monitoring and Evaluation
MICS	Multiple Indicator Cluster Survey
MRC	Medical Research Council
MSM	Men who have sex with men
NACP	National AIDS Control Program
NAS	National AIDS Secretariat
NGOs	Non-Governmental Organisations
NSF	National Strategic Framework
PAF	population-attributable fraction
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	people living with HIV (includes people with AIDS)
PMTCT	Prevention of mother-to-child transmission
STI	sexually transmitted infection
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
VCT	Voluntary Counseling and HIV testing
WHO	World Health Organization

Executive Summary

This synthesis paper describes the HIV epidemics in 15 West African countries -- Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, Togo, Cape Verde, The Gambia, Guinea Bissau, Liberia, and Sierra Leone. It focuses particularly on the degree to which the epidemics in each country are concentrated or generalised, and the implications for effective prevention. The urgent need for rigorous analytic work to equip countries with a sound, situation-specific analytical base for action motivated this study. The analysis team critically reviewed and interpreted all available surveillance, survey and research data (the amount and quality of which varied considerably by country). For the first ten countries listed, short country visits enabled interviews and more thorough search for data and other information, and the programmatic response to the HIV/AIDS epidemic was also assessed to develop recommendations for improving resource allocation and program effectiveness.

Key findings - HIV epidemics in West Africa

Although HIV has spread less than originally expected, West Africa still faces a serious epidemic. Recent population-based studies of HIV prevalence show that antenatal (ANC) surveillance overestimates general population HIV prevalence in most West African settings and that the epidemic is less generalised than originally believed. However, West Africa's HIV epidemic is serious, with around five million adults and children with HIV. In Cote d'Ivoire population prevalence is 4.7%; in Ghana 2.2% and it has decreased to 1.8% in Burkina Faso. In Benin, The Gambia, Guinea Conakry, Guinea Bissau, Liberia, Mali, Nigeria, Sierra Leone and Togo, population prevalence is between 1.2% and 1.5%, and ANC prevalence between 2.8% and 6.7%. Senegal, Niger and Cape Verde have general population prevalence below 1%. The available data indicate a more 'mixed' and complex situation than reflected in simple definitions.

Urban/rural, gender HIV differences: HIV prevalence is at least 1.3 times higher (and usually at least two-fold higher) in urban than in rural areas in 9 of 11 countries where data are available. Cape Verde is the only country with a strong predominance of cases among men; Burkina Faso, Niger and Sierra Leone have a gender HIV ratio close to one, and there are significantly more women infected in Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Mali and Senegal, with female: male ratios of HIV prevalence between 1.5 and 2.25. This may be partly the effect of lower survey participation rates by men, but also suggests feminization as the epidemic has matured.

Data and research provide strong evidence that **high rates of male circumcision** in most countries of West Africa **have helped contain the spread of HIV** and other sexually transmitted infections (STIs). But there is no evidence that male circumcision directly reduces transmission to women, or among men who have sex with men.

A feature of HIV epidemics in West Africa is the presence of the HIV-2 strain which is less transmissible and shows lower progression to disease. However, in most countries, the relative importance of HIV-1 has increased and is continuing to do so.

The most important core and bridging populations in the HIV epidemics in West Africa are female sex workers (FSWs) and their male clients. Sex work in West Africa is varied and has changed over time. In the past, many FSW in the region came from Ghana, and worked from a fixed location ('seaters'). Now they are being replaced by other nationalities, notably Nigerians, and local women. Foreign sex workers tend to practise 'overt', 'professional' or 'official' sex work, self-identify as sex workers, have no other income source, and work in the large cities. 'Clandestine', 'covert' or 'non/semi-professional' sex work appears to be growing, and often involves younger, local women, many of whom do not self-identify as sex workers, and have other occupations as well, fewer clients, lower condom use and higher rates of curable STIs.

High volume FSW account for a large part of commercial sex activity (sex acts), even if they are the minority of women engaged in the sex trade, and so are an important focus. At the other end of the spectrum, the boundaries between commercial and non-commercial sex are blurred. Young women who exchange sex for gifts and/or money without regarding this as 'selling sex' are unlikely to have large numbers of sex partners, but their partners may be older and have other concurrent sex partners. This makes these partnerships a cause for concern, deserving further investigation and focus within preventive education among youth.

Studies in West Africa show that **FSW clients come from all professions and all walks of life.** It is notoriously difficult to obtain accurate data on the proportion of men who have sex with FSWs, with substantial survey under-reporting. In the DHS household-based general population surveys, the proportion of men who report having paid for sex in the last year ranges from 1.3 to 2.9%. These data are however almost certainly gross underestimates, due to social desirability bias and selection bias (surveys of this type miss most men whose work takes them away from home or who live in barracks or other compounds). Other data sources and estimation methods suggest that the proportion of men who are clients is likely to be up to 10-fold higher than the DHS estimates. Research indicates that **high percentages of men with high mobility occupations buy sex** – such as (depending on the country) truckers, seasonal workers, police and army personnel, miners, fishermen, etc., who spend time away from their families. In addition to FSW partners, these men may also have high rates of sex with non-commercial female partners, forming a "bridge" between SW and the wider population.

HIV/AIDS educational campaigns have led to men buying less sex from overt/professional FSWs, particularly those working in brothels or other sex work establishments, and more from women who are not so obviously sex workers, perceived as lower risk, but with whom condom use is much lower.

The importance of MSM in the HIV epidemic is being increasingly recognised. HIV prevalence among MSM varies between 13.5% and 25.3% in different countries, much higher than any other group of men considered at high risk. Available data suggest that high rates of unprotected commercial and non-commercial anal sex occur between MSM in West Africa, with high rates of multiple partners. High proportions of MSM are also

married and/or have sex with other women, with very low rates of condom use, acting as a bridge for HIV between MSM men and women. In Senegal, where prevalence of 21.5% has been found among MSM in Dakar, assuming that 3% of men engage in male-to-male sex, an estimated 20% of current HIV infections could be due to sex between men.

There is **very little available information on injection drug use** in West Africa. Further work and vigilance is necessary to monitor its emergence -- HIV incidence rates can be literally explosive because of the high efficiency of transmission through injections and the structure of needle sharing networks.

Knowledge of condoms to prevent HIV transmission is highest in Benin for both men and women in the general population, and surpasses 80% among men in two other countries, Ghana and Guinea. In all countries except Senegal where 74% of both men and women know about condoms, 10-20% more men than women know that condoms can prevent HIV transmission. This indicator is below 50% among women in Burkina Faso, Liberia and Nigeria. **Condom use remains sub-optimal.** Condom use at last extra-marital sex was much higher among men, and higher in Burkina Faso and Senegal for men (60-70%) and women (30-40%) than in the other countries, where it varied between 37% and 52% among men, and between 6% and 26% among women.

Differences in **levels of risk behaviour** are correlated with differences in HIV prevalence across and within countries, although the paucity of recent data hampered this analysis. A combination of high risk behaviours may explain, at least in part, the much higher HIV prevalence in Côte d'Ivoire than the other countries: proportions of men and women reporting more than one partner in the last year, extra-marital sex among married people (reported by 25% of men and 5% of women), sexual activity among unmarried youth, and large age differentials between sexually active girls aged 15-19 and their male partners, are among the highest of all countries, and condom use remains low. Extra-marital sex was by far the least frequent in Niger (reported by 1.9% of men and 0.1% of women), and most frequent in Côte d'Ivoire, and in Guinea where prevalence among women in urban areas is one of the highest in the region. Pre-marital sex among youth was least frequent in countries with $\geq 90\%$ Muslim populations (Mali, Senegal and Niger), and highest in Côte d'Ivoire where over 50% of unmarried youth of both sexes were sexually active.

Interpretation of the data

Much more prevention focus is needed on the specific risk groups in which the epidemic and its transmission are primarily concentrated. Prevalence in both FSWs and MSM (where data are available) is nearly always over ten-fold higher (and in some cases much higher even than that) than in the general population. These very high prevalence differentials, plus very high rates of partner change and sub-optimal condom use by high risk populations, indicate that these groups contribute a high proportion of HIV infections. To be successful, effective prevention efforts must achieve high coverage of these groups. This applies even in Cote d'Ivoire, where the epidemic is much more generalised than in any other West African country.

Sexual behaviour data from the DHS and other surveys indicate that there is also potential for transmission of HIV *within* the general populations in most (if not all) West African countries. Given the relatively low prevalence of HIV in most West African countries in comparison to other parts of sub-Saharan Africa, it thus seems very likely that male circumcision has largely protected most West African countries from experiencing generalised epidemics. It is hard to determine on the basis of available data whether or not sexual networking in the general population is sufficient to sustain the epidemic *independently* of sub-populations at higher risk of infection.

In **Côte d'Ivoire** the epidemic is clearly more generalised than in any other West African country. This is likely due to rapid spread among core groups in the second half of the 1980s and the early 1990s, with extremely high prevalence among FSWs and a large FSW population, well-documented in Abidjan, combined with high levels of risky sexual behaviour among men and higher than average levels of risky sexual behaviour among women in the general population. These factors led to an epidemic that can be characterised as generalised, with sustained transmission occurring among members of the non-core population. However, since substantial transmission also still occurs between core groups and the general population through the bridge, it may be more appropriate to characterise the epidemic as “mixed”.

In **Ghana and Burkina Faso** (mainly urban Burkina), the epidemic has been substantially fuelled by multiple exchanges with Côte d'Ivoire. In Ghana, this was mainly related to the migration of women from Agomanya district to Côte d'Ivoire, where they became infected through sex work, and subsequently returned home and contributed to the HIV spread in this district of Ghana with the highest prevalence in the country. In Burkina Faso, this was related to the very high number of Burkinabè people who migrate temporarily to Côte d'Ivoire for work.

The epidemic in **Guinea Bissau** is hard to characterise, as this country is the historic epicentre of the HIV-2 epidemic and because of the lack of recent epidemiological data. The situation in **Nigeria** is also difficult to characterise in the absence of population-based HIV prevalence data. But Nigeria is undoubtedly among the countries with the highest burden of HIV in the world. Given large variations in HIV prevalence among ANC populations across states (ranging from 1.6% in Ekiti state to 10% in Benue state in 2005), it is very likely that some regions of this huge country are facing a generalised epidemic, whereas others are facing a concentrated epidemic.

Finally, extensive serial cross-sectional data from Benin and Abidjan, Cote d'Ivoire, and less extensive data from Burkina Faso, Ghana, Guinea, Niger, Senegal and Togo, indicate that **preventive interventions targeted towards FSWs and their clients can have a significant effect on HIV/STI and condom use rates among these populations.** Mathematical modelling using data from Cotonou, Benin, indicate that such interventions can also have a significant effect on HIV incidence and prevalence in women in the general population in the location. The Projet SIDA-1/2/3 interventions implemented over a 15-year period from 1993 to 2007 could have prevented nearly two thirds of new

HIV infections in FSWs and half of new infections in women in the general population in Cotonou. These data demonstrate the efficiency of interventions targeted towards core groups in the West African context, where high proportions of HIV infections are due to sex between FSWs and their clients.

Recommendations concerning surveillance and prevention research needs

1. **Expand the number of ANC sentinel sites** in many countries where this has not yet been done, including extension to rural areas, to ensure that ANC sentinel surveillance is more representative.
2. **Conduct Population-based surveys** on HIV prevalence, knowledge, attitude and sexual and HIV testing behaviour in countries where such studies are yet to be conducted; Repeat surveys every five years; Include a component on HIV test results and access to treatment; and Specifically monitor sexual behaviours of PLHIV.
3. **Carry out systematic Integrated Biological and Behavioural Surveys** every 2-3 years, which include at least initially a STI component, among FSW and their clients (national coverage); MSM (initially in urban areas or locations where this population is reachable, and expand coverage over time); other higher risk populations including prisoners, the uniformed services, and other groups depending on the specific country.
4. **Conduct specific research studies to:**
 - **Identify and enumerate FSWs** and better understand the extent to which different types of sex work contribute to the volume of transactional sex, different types of paying and non-paying partners of FSWs, as a basis for designing and monitoring more effective interventions;
 - **Characterize the MSM population** including size estimations and operational research on how best to reach this population for preventive interventions;
 - **Assess the extent of injection drug use** and its potential contribution to the HIV epidemics;
 - Use qualitative and new quantitative interview methods to produce **more accurate estimates of men's use of commercial and other transactional sex**;
 - **Monitor HIV prevalence and sexual behaviour among young people** and investigate (and avoid) potential increase in transactional sex activity in this group.
5. **Analyse DHS and other general population HIV prevalence data in more depth** to better understand determinants of prevalent HIV infection in the general population.
6. Improve the tracking of the epidemics by:

- **Refining and expanding the 2008 UNGASS behavioural indicators** to more appropriately measure risky behaviour (refine and re-specify the definition of ‘condom use during higher-risk sex’, add indicators for extra-marital sex and sex with FSWs, and define national level coverage targets based on estimates of the size of the high risk populations), and track the proportion of the HIV/AIDS budget spent on specific high risk populations;
- **In areas with established programs for FSWs and other high risk populations, develop a monitoring system with more refined indicators** including an assessment of population denominators for coverage estimates, and a system for tracking the number of people exposed to field interventions, numbers attending clinics for STI management and HIV screening, and the frequency of these activities per individual;
- **Estimating HIV incidence in high risk populations** using new testing methods for measuring recent HIV infections (the ‘detuned’ assay), once this methodology has been well-adapted to the African context.

Recommendations concerning the response to the epidemic

Analysis of the response to the epidemic in Benin, Burkina Faso Côte d’Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, and Togo, suggests these recommendations:

7. **Recognise the importance of prevention** - Advocate at all levels for increased interest in and funding for prevention (in most countries for which data are available, prevention is under-budgeted and under-funded).

High risk populations

8. **Priority groups for prevention** - Define and prioritise target groups for prevention on the basis of relative HIV prevalence and likely contribution to the epidemic: **Core groups** that should be targeted in addition to FSWs include MSM, prisoners and potentially IDUs; **Bridging populations** with above-average prevalence include FSW clients, non-paying partners of FSW (including regular partners and men involved in the sex trade), men in uniform, truckers and other mobile men;
 - **Target appropriate BCC to these populations**, and make STI treatment and condoms easily available; **Promote HIV testing among males**, particularly when presenting with an STI.
9. **Evidence-informed allocation of resources** – Apportion funding for prevention activities based on likely effect in preventing infections within priority populations:
 - **Prioritise funding for prevention activities among FSWs and their clients**, given that reducing transmission of HIV from FSWs can have very significant effects on HIV prevalence among the general population;

- **Fund interventions for higher risk populations in an holistic, coordinated manner**, including a defined minimum package of free-of-charge integrated services (including outreach and BCC in collaboration with NGOs, using peer educators; training and support for NGO and peer educators; free condom provision, STI care, VCT and HIV care and support components);
 - **Budget for mapping activities** to estimate the size of higher risk priority populations at country level **and for monitoring and evaluation of the interventions** and the levels of coverage they achieve;
10. **Scaling up “what works”** - Interventions for FSWs and other key high risk populations should be scaled up to national or provincial level. Encourage frequent HIV screening among FSWs as well as facilitated access to HAART. There are excellent models in West Africa on which to base scaling-up of FSW interventions, such as SIDA-3, PAPO-HV in Côte d’Ivoire, and the Yerelon Initiative in Burkina Faso, and models from elsewhere in the world, e.g. the Avahan Initiative in India.
11. **Structural interventions** including work with police to reduce violence and raids, and with men involved in the sex trade (e.g. pimps, brothel owners, security and other personnel, etc) to gain their support, etc., should be part of the package of key interventions for FSWs and other highly marginalised and stigmatised populations, to reduce stigma and violence, avoid negative consequences, provide support and protection and create an enabling environment that allows interventions to function optimally. This is of great importance for MSM, an extremely stigmatised population in Africa.

The general population

12. **Strongly link HIV testing, treatment and care with prevention, in an attempt to reduce onward transmission** - The massive expansion of VCT, PMTCT and AIDS treatment services offers a huge opportunity to link care and prevention:
- **Implement couple-oriented HIV testing services**, with appropriate culturally-specific counselling and support services to avoid negative repercussions of positive diagnoses within couples (violence, etc.). This is particularly important given data from many countries indicating that most HIV infections in couples are in discordant couples (i.e. one partner is positive and the other negative);
 - **Strongly encourage pregnant women to be simultaneously tested with their partners**;
 - **Promote partner reduction in BCC interventions**
 - Make all possible efforts – at the individual and societal level (media, etc.) – to **reduce the stigma** associated with HIV, increase knowledge and understanding, and encourage and support disclosure of status and adoption of safer sex behaviours by PLHIV;

- **Link VCT services to preventive education for HIV-negative individuals**, using the imparting of a negative test to reinforce continuing safe sex practices;
- **Make efforts to ensure high quality of VCT services** -- pre- and post-test counselling, waiting times, etc.;
- **Link preventive interventions to PLHIV treatment and care activities** in order to **limit onwards transmission of HIV** (PLHIV should be defined as key targets of prevention activities);
- **Link STI treatment services with VCT** - People presenting with STI symptoms (men with urethritis, men and women with genital ulcers, however *not* women with vaginal discharge) should be strongly encouraged to undergo HIV testing. An STI indicates recent high risk behaviour, and the likelihood of being in HIV primary infection is higher in people with a STI. HIV testing among people seeking care for STIs is thus a prime opportunity to identify new HIV infections and limit onwards transmission.

1. Background and Rationale

Approximately one third of sub-Saharan Africa's population live in West Africa. Although representing less than one third of the overall land area of the continent, the region is vast, ranging from Nigeria to Cape Verde and from the coast to the Sahel (Figure 1). The study region encompasses 15 countries: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

Figure 1: Map of Africa with 15 West African countries shaded



For many years, there was concern that West Africa's HIV epidemic would become as severe as in Southern Africa and parts of East Africa; consequently, intervention priorities were based on experience and approaches from Eastern and Southern Africa. Indeed, HIV sentinel surveillance data from pregnant women seeking antenatal care (ANC) --used for a long time as the basic information source to estimate prevalence in the general population-- surpasses 1% in nearly all West African countries, meeting the HIV prevalence level threshold that was proposed for a generalised epidemic.¹

In recent years, population-based studies of HIV prevalence have been carried out in most West African countries.²⁻¹² They have clearly shown that ANC surveillance yields overestimates of the general population HIV prevalence in most West African settings and that epidemics in the region are less generalised than originally believed, with prevalence < 2% in most countries for which population-based data are available and no country with prevalence > 5%. However, this is not to suggest that these epidemics are insignificant. Five percent is still far higher than observed anywhere outside Africa and is unacceptably high by any standard, and 2% is much higher than in any developed country. West Africa indeed faces a serious epidemic, with major health and development implications. There are around five million adults and children with HIV in

West Africa, and AIDS remains a fundamental health and development priority across the region.

The most serious consequence of the earlier overestimation of West Africa's HIV epidemic does not relate to the size of the epidemic, but to its characterisation and to HIV prevention priorities. Quite simply, overestimation of HIV prevalence may have distorted prevention priorities and responses in West Africa. AIDS programs have focused primarily on the general population and invested in interventions promoting HIV knowledge, behaviour change, condom use, and access to services for care of sexually transmitted infections (STIs) and/or voluntary counselling and testing (VCT) among the general population. Yet the epidemic may be more concentrated within specific risk groups than initially realised and there have been comparatively few investments and interventions to protect those groups.

Where problems and priorities are not well characterised, resources cannot be optimally directed and effectively used. Where generic tools designed for generalised epidemics are used to define the response and its priorities, there is an urgent need for rigorous analytic work, to equip countries with a sound, situation-specific analytical base for action.¹³

Thus, West Africa is currently confronted with a very important, but not well characterised or understood, epidemic, which still frequently tends to be viewed and addressed through an Eastern or Southern African lens. West Africa's challenge is to marshal knowledge to understand its own distinctive epidemics and the political commitment to protect those at greatest risk of contracting and transmitting HIV. This requires a deeper understanding of West Africa's epidemics and of effective interventions. West Africa's epidemics are eminently preventable – but only if their character is fully and rigorously understood and if scientific public health approaches are adopted and reinforced by conducive policies and structural interventions.

In this context, the overarching purpose of this synthesis paper is to better characterise West Africa's epidemics through an improved understanding of HIV transmission dynamics, to assess the extent to which existing responses address these transmission dynamics, and to recommend strategies to improve the effectiveness of West Africa's epidemic response.

2. Objectives, scope and limitations of report

2.1. Objectives of report

This synthesis paper provides an overview of the epidemiology of HIV and its heterogeneity at the regional, national and (where possible) sub-national provincial levels, and an assessment and critical evaluation of the response to the epidemic in West Africa. It aims to explore and describe the major characteristics, trends and status of the epidemics in the different countries, notably the degree to which they are concentrated or generalised (see section 3). In order to do this, the team critically reviewed and

interpreted available surveillance, survey and research data from the region, including: AIDS case reports, HIV prevalence surveys, behavioural surveys, STI data, HIV and STI research studies. This report offers recommendations for improvements in surveillance and research where needed. For some of the countries the team also assessed and critically evaluated the programmatic response to the HIV/AIDS epidemic; and offer recommendations for strategic priorities and resource allocation based on this assessment.

The main objectives of the review are to:

- (a) Characterise the HIV epidemiological situation in West Africa and:
 - 1. Delineate different HIV transmission patterns in West Africa;
 - 2. Compare and contrast HIV transmission among high risk groups and the general population;
 - 3. Estimate, where sufficient data exist, the proportion of HIV infections attributable to specific high risk groups;
 - 4. Identify, where possible, geographical areas and communities with elevated HIV prevalence.

- (b) For 10 of the 15 countries, assess the programmatic response to the HIV/AIDS epidemic and:
 - 5. Assess the extent to which strategic priorities and resource allocation address the major discrete transmission patterns and high risk groups;
 - 6. Make recommendations to enhance strategic prioritisation and resource allocation in the response to more closely match the epidemiological situation.

To this end we reviewed available published, official, grey and draft literature on the HIV epidemic in West Africa. Consultants made visits to the 10 countries for which an analysis of the response is presented (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, Togo), to gather available data, and meet and interview key players involved in research, intervention and in the programmatic response to HIV/AIDS in these countries.

2.2. Scope and limitations of report

Due to resource limitations and space restrictions, the report is not exhaustive. It focuses on: (a) an analysis of the available data with the objective of characterising the main driving factors of the epidemics, particularly with regard to the role of female sex workers and other high risk groups; (b) an analysis of the extent to which the response is appropriate to the prevailing epidemiological conditions, particularly with respect to the nature and funding of activities targeted towards high risk groups.

The amount and quality of information available varied considerably by country. Firstly, again due to resource restrictions, consultants made visits to only 10 of the 15 countries covered in this report. In general they spent only a few days in each country, during

which time they attempted to obtain all relevant literature (published and unpublished) concerning the epidemiology of HIV and the response to the epidemic in that country; as well as to meet and interview key relevant government officials and personnel working in national and international organizations. Unforeseen circumstances, delays and other difficulties sometimes occurred during these visits, reducing the amount of time available to the consultants to complete their objectives. Thus the depth and breadth of the information – written and verbal – obtained from different countries, was variable.

In addition, and for the five countries where country visits were not made, information was obtained through searches of the published literature using bibliographic search engines (PubMed, Google Scholar); and of websites of relevant international and in some cases, national organizations. The Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organisation (WHO) provided surveillance and other reports as available. In some cases we were able to obtain unpublished or draft reports through personal contacts.

We have done our best to make the report as up-to-date as possible at the time of writing, using the most recent data and information available to us. Indeed the report includes unpublished data from draft reports and other sources. However for some countries, the most recent data available to us was not very recent. In some cases this is because there is no available up-to-date data, and in others, because we were not aware of it or not able to obtain it, given the caveats detailed above. Also, with a fast-moving field such as HIV/AIDS, new information, data and reports are constantly being produced. It is possible therefore that some of the information in this report will be out-of-date.

We did not have the resources to carry out any analysis ourselves. Thus, we had to rely upon already available analyses of data sets. This applies particularly to the Demographic and Health Surveys (DHS) and similar data sets from the population-based HIV prevalence and behavioural surveys carried out in many West African countries in recent years. Published DHS country reports often contain only superficial analyses; many interesting variables are not analysed, and the reports do not on the whole contain any multivariate analyses of associations with HIV prevalence. This necessarily limited our ability to interpret the results of these surveys, which are an extremely rich source of epidemiological data and merit much further analysis. A more rigorous and extensive analysis and comparison of DHS data across West Africa, and indeed of sub-Saharan Africa, is highly desirable.

This same limitation applied to all the other survey data sets – Behavioural Surveillance Surveys (BSS), Integrated Biological and Behavioural Surveys (IBBS), etc. - again, we were only able to use data that was contained in reports, thus in some cases limiting the depth and utility of the interpretation.

In general, summary information only is provided in this report (for more detailed presentations and discussions of data and information, the interested reader may request the unpublished country specific reports from wbglobalHIVAIDS@worldbank.org).

3. Conceptual framework

3.1. Heterogeneity of HIV epidemics

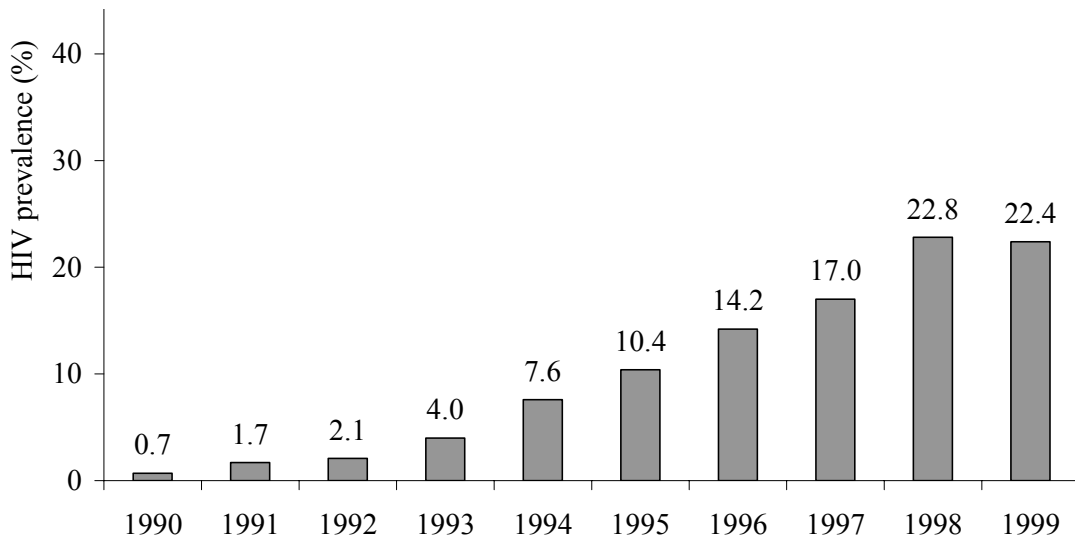
Since the introduction of HIV, a variety of patterns of both sexually transmitted (heterosexual and homosexual) and injection drug use associated epidemics have been observed.¹⁴ In different contexts, HIV has initially taken hold, and reached a certain saturation level, in different high risk populations (core groups) characterised by high levels of injecting and/or sexual risk behaviour, before diffusing at differing rates and to varying extents into the ‘general’, low-risk (non-core) population.¹⁵ Outward spread of HIV from core groups depends on the existence of ‘bridges’, that is individuals who interact with both high risk (core) and low-risk (non-core) sectors of the population,^{16,17} and who ‘seed’ infections in the low-risk population. The extent of initial outward spread is determined by the nature, degree and frequency of interaction between the core, the bridge and the ‘general’ population (which will influence *rates of exposure* to HIV), and by the presence or absence of co-factors, which influence the per act *transmission probability* of HIV. The subsequent scale of HIV transmission within the ‘general’ population then also depends on levels of risk behaviour (mixing patterns) and co-factors in that population itself.

In sub-Saharan Africa, the dominant mode of HIV spread has been through heterosexual transmission. Under certain conditions, heterosexual spread of HIV can be rapid and explosive. Rapid heterosexual spread is, in some situations, largely confined to high risk (core) groups,¹ whereas in others it can become generalised to significant proportions of the population. In South Africa, HIV prevalence rose from <1% to over 20% in pregnant women within 10 years, from 1990-1999 (Figure 2). In Cotonou, Benin (West Africa), HIV prevalence among female sex workers (FSWs) rose from less than 5% to over 50% within seven years, from 1986-1993 (Figure 3).¹⁸ This has been followed by a gradual diffusion of HIV into the general population, as evidenced by a much slower but apparently sustained increase in prevalence in pregnant women in Benin (Figure 3).¹⁹

Factors influencing the extent of sexual spread of HIV are complex, and very diverse sexually-driven epidemic patterns have been observed. This may in part be related to the relatively low efficiency of sexual transmission of HIV,^{20,21} and its sensitivity to the influence of co-factors on transmission rates.

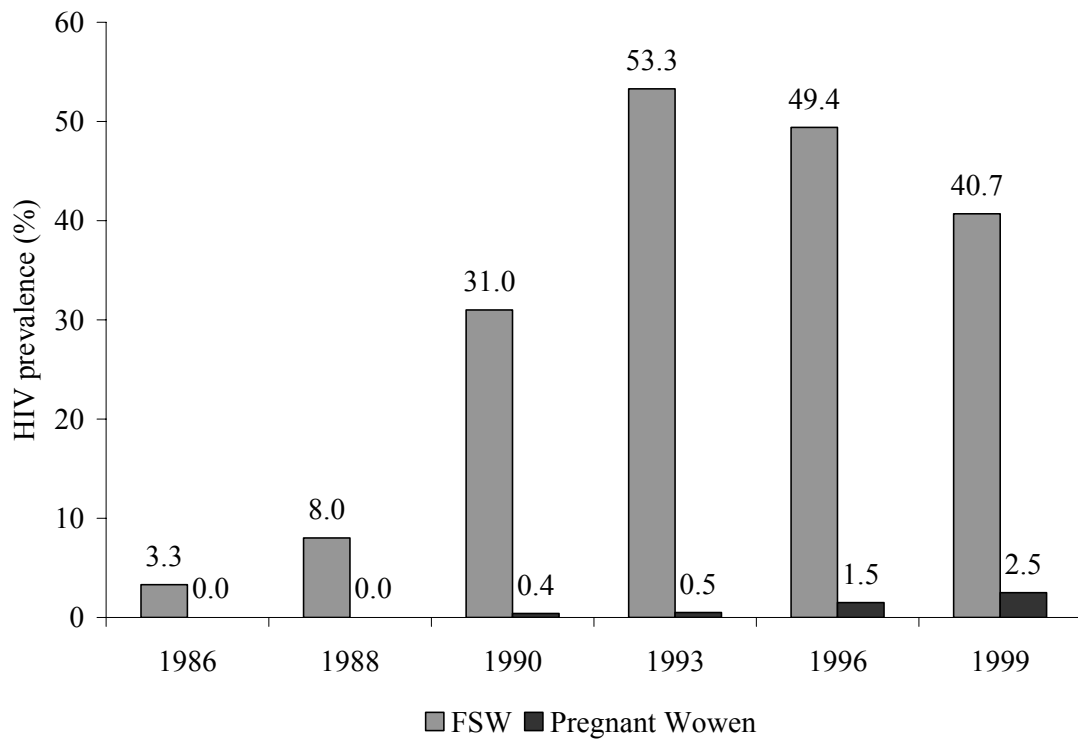
¹ Throughout this report “high risk group” refers to a group or community of people engaging in practices or behaviours that put them at increased risk for HIV acquisition and transmission. Such groups are also known as “most at-risk populations (MARPs)”.

Figure 2: HIV prevalence among pregnant women in South Africa, 1990-1999



Source: Department of Health, South Africa; UNAIDS

Figure 3: Evolution of HIV prevalence among pregnant women and female sex workers (FSWs) in Cotonou, Benin

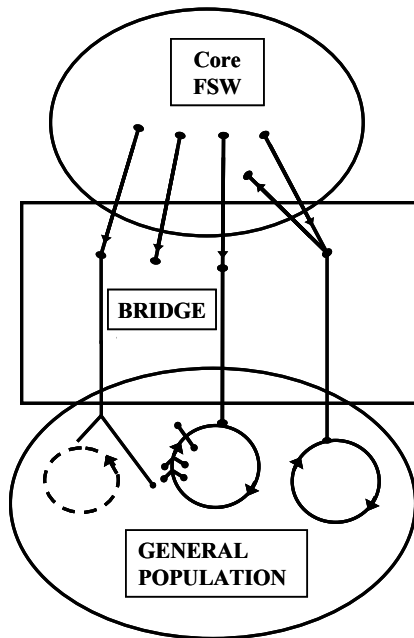


Source: Alary et al., 2002; Adjovi, 1999

3.2. A conceptual framework for transmission of HIV in the sub-Saharan African context

Figure 4 shows a simple schematic diagram of pathways of HIV transmission in the sub-Saharan African context. The top circle represents the core group, in this case the FSW population, the dominant core group in sub-Saharan Africa. FSWs in this core group become infected with HIV through sexual contact with HIV-infected clients or non-commercial partners. FSWs in turn transmit HIV to their clients and other sex partners. Three outcomes are then possible : (a) some infections transmitted to male sexual partners of FSWs will be ‘dead-end’, i.e. will produce no further infections, if these men do not have other sex partners; (b) some infections will be transmitted back to the FSW population and fuel increasing HIV incidence in this core group, by men having sex with more than one FSW; (c) HIV infection can be transmitted to the low-risk general population by male clients (or other sexual partners) of FSWs who also have sex with women in the low-risk population. This is the **bridge** - between the core group of FSWs and the general population of non-FSW women.

Figure 4: Schematic diagram of pathways of HIV transmission in sub-Saharan Africa: concentrated vs. generalised epidemics.



Factors influencing the rate and extent of HIV spread

- HIV prevalence / incidence
- HIV transmission probability (STIs, viral load, male circumcision, strains, condom use, needle sharing, etc)
- Sexual / IDU mixing patterns (degree dis/assortative mixing, rates of partner change)
- Size of core and bridge groups
- Spatial distribution/heterogeneity
- Dynamic nature of phenomena associated with HIV transmission
- $R_0(R) < \text{or} > 1$

Thus, some infections in male sexual partners of FSWs will be ‘**productive**’ (i.e. will produce more infections), while others will be ‘dead-ends’; some infected people will be within the core (FSWs) while some (low-risk female partners of male sexual partners of FSWs) will be outside it.

Factors which influence the scale of sexual HIV transmission outwards from FSWs include: (a) HIV prevalence and incidence among FSWs; (b) stage of HIV infection and consequent viral load; (c) the extent and patterns of sexual mixing and rates of partner

change between FSWs and their sex partners; (d) levels of sexual risk behaviour in these partnerships, including condom use rates and type of sex; (e) STI type and prevalence in FSWs and their sex partners; (f) male circumcision rates; (g) other potential co-factors influencing transmission probability. High levels of concurrency, and of proportions of people in the primary infection stage of HIV, can fuel rapid transmission of HIV due to presence of very high viral titres which dramatically increase per act transmission probability.²²⁻²⁴

Within the general population, a distinction can be made between heterosexually acquired HIV infections that occur as a result of **'first-wave'** HIV transmission outwards from FSWs, and **self-sustaining** heterosexual epidemics. The size and behaviour of the bridging population, and co-factor levels including STI prevalence and male circumcision rates, will determine the scale of first-wave transmission, and can also initiate self-sustaining heterosexual epidemics through seeding of infections in 'productive' networks within the general population. STI prevalence, male circumcision rates, sexual mixing patterns including concurrency, and sexual risk behaviour *within* the general population will then be crucial in determining the scale of HIV spread.

Thus, once HIV infections are seeded among the wider general population, the subsequent scale of heterosexual HIV transmission within this population will depend on whether or not infections transmitted from a member of the bridge are 'dead-end' or 'productive'.

Looking at this in mathematical modelling terms, the likelihood of sustained heterosexual transmission occurring will depend on the basic reproductive number (R_0) of HIV within the general population – that is, the mean number of secondary cases of HIV infection generated from one infectious individual in a susceptible population,²⁵ which must be above one for persistence to occur. The basic reproductive number is a product of *HIV transmission probability* (β), and two other parameters – the duration of infectiousness (D) and the rate at which susceptible individuals change partners (c : *degree of exposure*). R_0 can be seen as a composite measure of transmission success in a defined population, and its magnitude determines the likelihood, speed and scale of the spread of infection.²⁶ As an epidemic progresses and increasing proportions of people become infected, the effective reproductive number R – which is the product of R_0 and the proportion of susceptibles in a population, becomes the key parameter. In situations of rapid HIV transmission and explosive epidemics (in core groups or the general population), the observed slowing in the rate of increase in HIV prevalence after a certain time may be due at least in part to a reduction in the proportion of susceptible people in the population, with fewer individuals who are susceptible to infection available to sustain transmission.

As detailed in Figure 4, a number of individual-level *proximal* factors, both behavioural (which influence degree of exposure) and biological (which influence transmission probability) – interacting with more distal social, community, environmental and structural factors – will influence this outcome.

HIV epidemics can be classified into different **states**, according to the **transmission dynamics** which drive them (Box 1) and their potential for generalisation, that is, the extent to which an epidemic can be maintained and amplified *beyond* the spread within networks that are directly linked to high risk sub-populations.¹ Broadly, HIV epidemics can be **concentrated** – where degree of spread within the general population depends on continuous (**first-wave**) ‘seeding’ of infections from bridging populations; and **generalised**, where transmission of HIV becomes independent and **self-sustaining** within the general population. In some situations, **low-level** epidemics occur, when HIV prevalence remains low in both vulnerable sub-populations and the general population. Unfortunately, numerical proxies that had been suggested to correspond to the different epidemic states (e.g HIV prevalence consistently > 1% among pregnant women at ANC clinics for a generalised epidemic, Box 1) have often received too much prominence and led to confusion, at the expense of the actual definition based on the transmission dynamics.

Box 1: Three different epidemic states

Low-level

- Principle: Although HIV infection may have existed for many years, it has never spread to significant levels in any sub-population. Recorded infections are largely confined to individuals with higher risk behaviour: e.g. sex workers, drug injectors, men having sex with other men. This epidemic state suggests that networks of risk are rather diffuse (with low levels of partner exchange or sharing of drug injecting equipment), or that the virus has been introduced only very recently.
- Numerical proxy: HIV prevalence has not consistently exceeded five percent in any defined sub-population.

Concentrated

- Principle: HIV has spread rapidly in a defined sub-population, but is not well-established in the general population. This epidemic state suggests active networks of risk within the sub-population. The future course of the epidemic is determined by the frequency and nature of links between highly infected sub-populations and the general population.
- Numerical proxy: HIV prevalence consistently over five percent in at least one defined sub-population, and HIV prevalence below one percent in pregnant women in urban areas.

Generalised

- Principle: In generalised epidemics, HIV is firmly established in the general population. Although sub-populations at high risk may continue to contribute disproportionately to the spread of HIV, sexual networking in the general population is sufficient to sustain an epidemic independent of sub-populations at higher risk of infection.
- Numerical proxy: HIV prevalence consistently over one percent in pregnant women.

Source: WHO/UNAIDS, 2000

There is also the important and under-recognized category of **mixed epidemics**, in which new infections are driven by sub-populations at high risk *and* the general population. Mixed epidemics require a careful balance between effective targeted interventions for high risk populations and large-scale interventions in the wider general population.

The epidemics in East and Southern Africa have been classified as generalised – the epidemics are firmly established in the general population, with very high HIV prevalence among pregnant women attending ANC services and among men and women in population-based surveys. In these countries, the contribution of high risk sub-populations, such as sex workers, to the spread of HIV epidemic may however continue to be substantial, due to very high HIV prevalence, high rates of partner change and sub-optimal levels of condom use among these populations. A recent study in Zimbabwe for example estimated that 20% of prevalent infections in men are attributable to sex with FSWs.²⁷ In Kenya as a whole, it has been estimated that in 2005, sex workers and their clients accounted for 12% of new infections;²⁸ while injection drug users and MSM were each estimated to have accounted for 5% of new infections. Another study estimates that 10% of prevalent infections in Kenya are attributable to sex between men.²⁹

In Kenya, an estimated 8000 female sex workers operate along the trans-Africa highway that links Mombasa and Kampala (in neighbouring Uganda). According to a recent study, HIV prevalence among sex workers is estimated at about 50%, and the annual number of sexual acts per FSW is estimated at 634 (with 129 different partners). If condom use increased from 77% to 90%, about 2000–2500 (two thirds of) new HIV infections could be prevented annually on that section of the highway (with a decline in HIV incidence from 1.3% to 0.4%).³⁰ The study also exemplifies how behaviour change in these high risk populations may have an effect on slowing the spread of HIV, even in situations of generalized epidemics, where sexual networking in the general population is nevertheless sufficient to sustain an epidemic *independently* of these high risk sub-populations.

The nature of the epidemic state in West Africa is less clear. HIV prevalence in the general population of these countries is much lower than in East and Southern Africa (section 4.1), but still above 1% in most countries, and in some cases above 5% in pregnant women. As discussed in more detail in section 4.4, recent population-based surveys show that in general ANC prevalence overestimates general population prevalence, which is $\leq 1.5\%$ in 8 of 11 West African countries for which data are available.^{2-6,8,11,12} In Cote d'Ivoire population prevalence is 4.7%; in Ghana 2.2% and in Burkina 1.8% (section 4.4; Table 3).^{7,9,10} In these three countries, the epidemic may be considered as generalised, with sufficient transmission occurring within the general population to sustain an epidemic independently of outwards transmission from high risk populations. However, it may be more appropriate to characterise these epidemics as “mixed” -- new infections are driven by sub-populations at high risk *and* the general population, since transmission from core and bridge populations still contributes substantially. At the other extreme, Senegal, Niger and Cape Verde may be considered as having concentrated epidemics, with general population prevalence below 1%, and maintenance of the epidemic dependent on outwards transmission from highly-infected high risk populations. For the countries ‘in the middle’ – Benin, The Gambia, Guinea

Conakry, Guinea Bissau, Liberia, Mali, Nigeria, Sierra Leone and Togo – with population-based prevalence between 1.2% and 1.5%, and ANC prevalence between 2.8% and 6.7%, the situation is less clear. As we will discuss in detail in this report, the contribution of outward first-wave transmission from high risk populations has been and remains substantial in these countries. It is nevertheless hard to conclude on the basis of available data whether or not the epidemics in most of these countries could be maintained *solely* by transmission in the general population, without continuous feeding from high risk populations – i.e. whether sexual networking in the general population is sufficient to sustain an epidemic *independent* of sub-populations at higher risk of infection.

One of the main objectives of this report is to gather and interpret available data and evidence in order to attempt to better characterise the epidemics in West Africa, and in particular, to what degree they are generalised and what proportion of HIV infections are due to sex with members of high risk populations.

Another characteristic of HIV epidemics is their **epidemic phase** – that is, how far an epidemic has progressed along its expected trajectory of HIV prevalence and subpopulation distribution. Each type of epidemic can occur at an ‘incipient’, ‘growth’, ‘plateau’ or ‘decline’ phase. Knowledge of when HIV was introduced and how it has progressed and spread within specific sub-populations and the general population is necessary in order to assess epidemic phase, as well as an understanding of the biological and behavioural HIV-associated risk in high risk sub-populations and in the general populations with whom they interact. However, the situation becomes more complicated with rapid scale-up of access to anti-retroviral treatment. In this context HIV prevalence will increase due to a decreased mortality rate, potentially obscuring a plateau or decline in prevalence, and complicating the interpretation of epidemic phase.

In this report, the above epidemiological concepts will be used as the exploratory and analytical framework for understanding and characterising the current status and future potential of HIV epidemics in West Africa. Understanding this is central to designing appropriate epidemic responses, since the effectiveness and cost-effectiveness of interventions – and the relative importance of targeted vs. general population interventions – depend on the epidemiological context in which they are implemented.³¹

3.3. Core and bridging groups in West Africa

3.3.1. Sex work in West Africa

As discussed above, the central core and bridging populations in the HIV epidemics in West Africa are FSWs and their male clients. Heterogeneity is evident in the organisation of sex work in West Africa, and sex workers’ characteristics and behaviour have changed significantly in the last two decades.

Traditionally, many sex workers in the region came from Ghana, and work from a fixed location ('seaters'). The presence of Ghanaians in other countries of the region was largely due to economic migration following the construction of the Akosombo dam. In Cotonou, Benin, for example, Ghanaians made up 66% of a sample of sex workers recruited at a clinic for sex workers (Projet SIDA-3) in 1993.¹⁸

Due to improvements in the economic situation in Ghana, and other factors including HIV/AIDS, many Ghanaians have returned home. They are being replaced by other nationalities, notably Nigerians (again moving for economic reasons), as well as, increasingly, by indigenous women. In a Projet SIDA-3 survey carried out in 2005, Ghanaians made up only 14% of the sample of sex workers in Cotonou, whereas 43% were from Nigeria (11% in 1993) and 19% were from Benin (2% in 1993).³²

Foreigners tend to practise 'overt', 'professional' or 'official' prostitution, and typically self-identify as sex workers. Sex work is often the sole source of income for these women. This type of prostitution tends to be most frequent in major / capital cities in West Africa. For example, in Lome, the capital of Togo, only 38% of overt sex workers were Togolese in 2005; the same proportion (38%) was Ghanaian, and other main nationalities were women from Nigeria and Benin. The proportion of Togolese sex workers was considerably higher in the regions outside Lome.³³

'Clandestine', 'covert' or 'non / semi-professional' sex work tends to be practised by indigenous women, who frequently do not self-identify as sex workers, and who often have other occupations besides sex work, e.g. students, apprentices, bar servers, waitresses, hotel workers, hairdressers and seamstresses, market / stall sellers. This type of sex work is becoming more frequent in many countries of the region, due to growing poverty and socio-political instability.

Clandestine sex workers tend to be younger than overt sex workers, have a lower HIV prevalence, higher rates of curable STIs, smaller numbers of clients, and use condoms less frequently.^{32, 34} They tend to practise sex work on a part-time basis and also have other professions.

Sex work in West Africa is practised in a variety of settings, including brothels, bars with rooms attached, the street, nightclubs, restaurants, etc. Street and bar sex work, practised by women of all nationalities, is becoming more frequent, as is sex work practised by indigenous women.³⁵ In Mali in 2005 for example, the majority of both overt and clandestine sex workers were Malian – 53% of professional and 76% of clandestine.³⁴

Different patterns of mobility and migration are also seen – foreign sex workers may stay in their chosen place of work for varying periods of time, and be motivated to move around for various reasons – returning home to visit, moving to another city or even country where more money / clients are available, etc. Local economic and other changes, which may occur rapidly, may thus have significant effects on sex worker behaviour and mobility. Indigenous sex workers may be more stable geographically, but may practice sex work more intermittently than foreigners.

In recent years there have been some indications that, due to HIV/AIDS educational campaigns, men are buying sex less frequently from overt / professional FSWs, particularly those working in sex work establishments such as brothels, since they regard them as at high risk for having HIV. Instead they may buy sex from women who are not so obviously sex workers, who do not solicit and practice in known sex work environments, do not necessarily look like ‘typical’ FSWs, and who the men think are not infected with HIV. Condom use tends to be lower in these situations than in overt commercial sex work, where prevention programs have frequently led to increases in condom use rates to very high levels.

In addition to ‘high-volume’ sex work, data suggest that some young women engage in sex in exchange for gifts and/or money. These transactions are not seen as ‘selling sex’ *per se*, and the women that engage in such practices are not likely to have large numbers of sex partners. However, particularly since the men in these partnerships may be considerably older than the women and have one or more other concurrent sex partners, such partnerships are a cause for concern, deserve further investigation and a deeper understanding, and should be a focus of preventive education among youth.

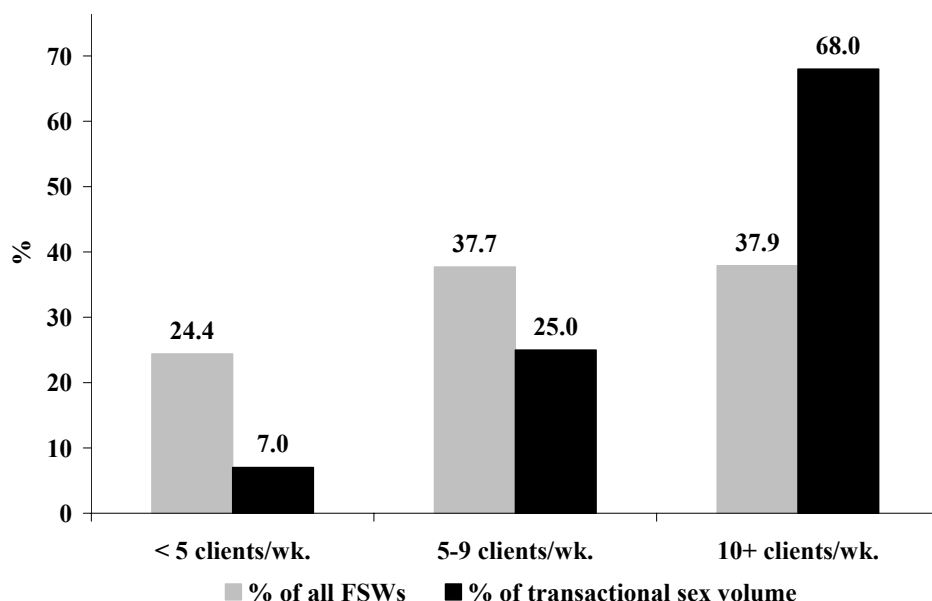
The boundaries between commercial and non-commercial sex are blurred. A recent review stated that ‘identification of “sex worker sexual contact” on the basis of paid sex is often unrealistic because sex is exchanged for money by a wide range of men and women, irrespective of employment or union status’.³⁶ However, for HIV transmission dynamics and the design of prevention programs targeted to sex workers and their clients, the key issue is the potential for transmission in these situations. This will depend on HIV (and STI) prevalence and incidence, numbers of sex partners, rates of sexual partner change and the degree of concurrency, as well as condom use rates in these partnerships.

We will focus particularly on high volume commercial sex in this report, since, as shown in other settings, high volume FSWs account for a large part of commercial sex activity (sex acts), even if they are the minority of women engaged in the sex trade (Figure 5). Also, FSWs with few clients, closer to the interface between commercial and non-commercial sex, tend to exhibit different risk behaviours than FSWs with many clients.

3.3.2. Clients and other sex partners of FSWs

Male clients of FSWs contract HIV from and transmit HIV to FSWs; HIV-infected clients then transmit the infection to their other regular or casual female partners. Regular non-paying partners of FSWs, who have very low rates of condom use with FSWs and frequently have multiple FSW partners, are also likely to contribute substantially to rates of new infections among FSWs.

Figure 5: Most transactional sex is accounted for by a minority of female sex workers with large numbers of clients: example from Karnataka State, South India.



Source: personal communication, Dr BM Ramesh, Karnataka Health Promotion Trust

Studies in West Africa show that FSW clients come from all professions and all walks of life. For example, in a survey in Cotonou, Benin, clients' professions included businessmen, labourers and construction workers, qualified manual labourers and artisans, drivers of vehicles and students.³⁷

Buying sex is very common among men with high mobility occupations – those who are 'geographically single' i.e. who spend significant periods of time away from their families – including (depending on the country) truckers, seasonal workers, police and army personnel, miners, fishermen, etc. For example, in the BSS carried out in 2002 in five cities in Burkina Faso and 11 sites in Côte d'Ivoire, 24% of truckers in both countries reported sex with FSWs.³⁶ As we shall see in this report, in addition to FSW partners, these men may also have high rates of sex with non-commercial female partners.

It is notoriously difficult to obtain accurate data on the proportion of men who have sex with FSWs. Due to strong social desirability bias – increased by HIV campaigns – estimates from household-based surveys grossly underestimate the true proportion. As we will discuss in the report, alternative interview methods, interviews with men away from home, and other estimation methods all indicate much higher proportions of men who are clients of FSWs. Furthermore, household-based surveys do not include military barracks or workers' hostels or other specific locations where single men with high risk behaviour might live.

In a recent review, using data from national population-based surveys (mainly DHS), an average of 9% of men in nine West African countries reported sex in exchange for money, gifts or favours in the last year; whereas only 1.1% in five countries reported paying for sex.³⁶ The median urban: rural ratio was 1.1:1. Rates tend to be highest in the 20-24 age group, gradually declining across older age groups.

Due to a change in the wording of questions in all DHS surveys in sub-Saharan Africa from an extended definition – ‘sex in exchange for money, gifts or favours’ – to a narrower ‘sex in exchange for money’ or ‘sex with a sex worker’, it is difficult to say whether the decreases in the proportion of men answering yes to this question indicate real decreases in the proportion of men having sex with FSWs, or is due to the wording change, or indeed to a change in propensity to report this behaviour.³⁶ For example, recent surveys in Rwanda and Uganda show that less than 2% of men reported sex with sex workers, a figure ten times lower than that reported in earlier surveys conducted in the 1990s. Overall, using the wide definition, rates of sex with sex workers were highest in Central Africa (13-15%), followed by Eastern and Southern Africa (10-11%) and West Africa (9%).³⁶

Available data and estimates for the size of the male client population in West Africa are discussed in detail later in this report.

3.3.3. Men who have sex with men (MSM)

The importance of MSM - who until very recently have been a highly neglected population - in the HIV epidemic, is being increasingly recognised. As we will discuss in the report, estimates from Senegal suggest that up to 20% of new infections in Senegal may be attributable to sex between MSM.²⁹

MSM may in fact be both a core and a bridging population. Available data suggest that high rates of unprotected commercial and non-commercial anal sex occur between MSM in West Africa; high proportions of these men are also married and/or have sex with other women, also with very low rates of condom use. Bisexual men thus act as the bridge between women and homosexual men.

3.3.4. Injection drug users (IDUs)

Although there is increasing evidence for the growing importance of injection drug use in Southern and East Africa, there is very little available information on this in West Africa, apart from some small studies and rapid assessments carried out in Nigeria. Further work and vigilance is necessary to monitor the emergence of this phenomenon, where due to the greater efficiency of transmission through injections and the structure of needle sharing networks, HIV incidence rates can literally be explosive. For example, data from Togliatti City, Russia, indicate that prevalence reached 60% in IDUs in under two years.³⁸

4. The HIV epidemic in West Africa

4.1. The West African epidemic in the context of the African continent

Sub-Saharan Africa has been and remains the region by far most affected by HIV/AIDS. Just over 10% of the world's population lives in this region, but 67% of adults and nearly 90% of children with HIV live here. Three quarters of all AIDS deaths in 2007 occurred in this region.³⁹ An estimated 1.9 million people were newly infected with HIV in 2007 in Africa, bringing to 22 million the total number of people living with HIV.

A combination of biological, behavioural and structural factors account for this (section 3.2): (a) biological factors which increase the per act transmission probability of HIV include: historically high rates of ulcerative and other STIs; high proportions of people in the primary stage of infection when viral loads and transmission probabilities are much higher; HIV-1 strain differences, particularly in Southern Africa; (b) at the behavioural level, factors which increase the rate of exposure to the virus, including young age at first sex; high levels of concurrency and large age differences between male and female sex partners; and (c) structural factors – cultural and socio-economic factors, including the: subordinate position of women; poverty; educational level; impoverishment and decline of social and health services; rapid urbanisation and modernisation.⁴⁰

Women often face discriminatory laws, traditions, and values when trying to access education, knowledge, land, capital and employment.⁴⁰ They have little power to negotiate sexual fidelity or condom use with their husbands. Their legal situation may prevent them from inheriting or owning property, this, and cultural customs such as *levirat* (marriage of widows to their dead husband's brothers) increase their vulnerability. HIV prevalence is often disproportionately high in divorced and widowed women.

While these factors are common to most if not all sub-Saharan Africa countries to varying extents, there is remarkable heterogeneity in the extent of spread of HIV across countries, with population-based HIV prevalence rates varying from less than 1% to around 25% of the population (Table 1). Even higher rates are seen in pregnant women in some countries in Southern Africa. As can be seen from the Table 1, in general, East and particularly Southern Africa have been much more severely affected than West and Central Africa.

For many years, the differing rates of HIV in various parts of Africa were attributed mainly to differential timing of introduction of the virus, and the assumption was that HIV levels in Central and West Africa would in time reach those of East Africa. However the persistence over time of huge differentials across African countries in HIV prevalence made this explanation increasingly less plausible.⁴¹ We now know that the explanations for these dramatic variations lie in the transmission dynamics of HIV, which, as discussed in Section 3.2, are influenced by the probability of sexual transmission from one infected person to an uninfected partner, as well as patterns of sexual behaviour, including the rate of sexual partner change, which influence the *degree of exposure* to infected people. Epidemiological

evidence suggests that differences in both transmission probability (β) and sexual behaviour (c) are important in explaining epidemic variations in different parts of Africa.

Table 1: HIV prevalence, male circumcision and sexual behaviour in sub-Saharan Africa

Country	Year	% of men circumcised	% HIV	Sex >1 partner last year M - F	15-24 unmarried: sex last year M - F	Sex with FSW last year
West Africa						
Benin	2006	96.4%	1.2%	27% - 1%	41% - 38%	1.7%
Burkina Faso	2003	89.7%	1.8%	24% - 2%	32% - 26%	
Côte d'Ivoire	2005	96.0%	4.7%	31% - 5%	56% - 58%	2.2%
Ghana	2003	95.3% *	2.2%	10% - 1%	24% - 30%	1.5%
Guinée	2005	98.7%	1.5%		53% - 36%	1.2%
Liberia	2007	~100%	1.5%	22% - 7%		
Mali	2005	~100%	1.3%	23% - 2%	16% - 8%	2.0%
Niger	2006	~100%	0.7%		10% - 2%	1.3%
Nigeria	2003	~99.0%			77% - 27%	2.9%
Senegal	2005	~99.0%	0.7%		21% - 2%	
Central, East and Southern Africa						
Botswana	2004		17.1%	5.4%		
Cameroon	2004	91.8% *	5.5%			
Congo	2005			28% - 8%	66% - 59%	
Kenya	2003	83.7%	6.7%	17% - 2%	41% - 21%	
Lesotho	2004-5	48%	23.5%			1.7%
Malawi	2004	20.7%	11.8%			
Madagascar	2003-4			20% - 3%		4.0%
Mozambique	2003	59.5%		35% - 6%	54% - 67%	13%
Rwanda	2005	9.6%	3.0%	5% - 1%	9% - 5%	
South Africa	2003			4% - 3%		
Swaziland	2006-7		25.9%	29% - 4%	91% - 69%	
Tanzania	2003-4	69.7%	7.0%	30% - 4%	43% - 29%	11%
Uganda	2004-5	24.8%	6.4%	29% - 4%	30% - 24%	
Zambia	2001-2		15.6%		33% - 28%	29%
Zimbabwe	2005-6	10.3%	18.1%	14% - 1%	28% - 13%	3.9%

National population-based HIV-related risk behaviour and seroprevalence surveys (DHS, AIS, etc.) with comparable methodologies.

* Percentage of circumcised men among those tested for HIV

The Four Cities Study was a population-based survey carried out in 1997-8 with comparable methodologies in two cities (Cotonou in Benin and Yaounde in Cameroon) with a relatively low prevalence of HIV-1 ($\leq 5\%$) and two cities (Kisumu in Kenya and Ndola in Zambia) with a relatively high prevalence of around 25%.⁴²

The survey results indicated that differences in sexual behaviour patterns alone could not explain differences in HIV-1 prevalence in low and high prevalence countries. Apart from young age at first marriage, and young age of women at sexual debut, most other parameters of risky behaviour, such as contact with sex workers, lifetime number of sexual partners, rate of acquisition of new partners, concurrent partnerships and lack of condom use, were not consistently more common in the high than the low prevalence sites.⁴³ While some of these risk factors were associated with HIV prevalence in at least one of the cities, they were not overall more common in the two low vs. the two high prevalence cities.⁴⁴ However, nearly all males were circumcised in both low prevalence cities of West and Central Africa; and genital herpes was more common in both high-prevalence cities of East and Southern Africa.^{44, 45}

Differences in sexual behaviour were thus outweighed by differences in the prevalence of biological factors that alter the probability / efficiency of HIV transmission during sexual intercourse, namely male circumcision and infections that cause genital ulcerations, i.e. herpes simplex virus-2 (HSV-2) infection.^{40, 46}

The findings show how the spread of HIV-1 is determined by a complex interplay of sexual behaviour, including rate of partner change and sexual mixing patterns between groups with different levels of sexual activity, different age groups, or both, and biological factors that affect the probability of HIV-1 transmission per sex act.⁴⁰

The following caveats to these results should be noted: (a) potential differential changes in sexual behaviour over time, due to the differing intensities of the epidemics and the effects of this on mortality from AIDS and depletion of the highest risk segments of the population; (b) the possibility that important / relevant culturally-driven behaviours were either not measured, or that HIV-associated risk behaviour was differentially under-reported due to differing social desirability biases.^{41, 47}

Nevertheless, the findings, in combination with evidence from other studies, suggest that high rates of male circumcision in most countries of West Africa may have contained the spread of HIV and other STIs.

Scientists have noted an association between male circumcision and HIV prevalence levels since the 1980s.⁴⁸ The biological basis for this relationship is plausible,^{49, 50} and a meta-analysis of 38 studies from Africa concluded that uncircumcised men were more than twice as likely to have HIV as circumcised men.⁵¹ In addition to the observed strong individual-level and ecological associations between male circumcision and HIV prevalence, very strong and consistent experimental evidence of the effect of circumcision on HIV incidence is now available. Evidence from three recent randomized controlled trials in Kenya, South Africa and Uganda indicates that safe male circumcision

reduces the risk of heterosexual acquisition of HIV infection from women to men by approximately 60%.⁵²⁻⁵⁴

Indeed male circumcision is now being promoted, with due caution, in countries where rates are currently low and HIV prevalence is high, as an additional tool for prevention of new infections. There is no evidence however that male circumcision reduces the risk of transmission of HIV from men to women,⁵⁵ and it may even increase the risk if sex is resumed before the circumcision wound has healed. This reinforces the need for intensive counselling regarding non-resumption of unprotected intercourse during the early post-operative period.

One of the most useful recent sources of data on both male circumcision rates and HIV prevalence in sub-Saharan Africa are the DHS+ and related surveys (e.g. the AIDS Indicator Surveys [AIS]) – population-based surveys involving interviews and biological sample collection (dried blood spots) for HIV testing, which have now been carried out in many countries of sub-Saharan Africa, mainly in the last five years (Table 1). These surveys are a rich source of comparable data on HIV epidemiology in the region.

Overall, as Table 1 shows, the ecological relationship between rates of male circumcision and HIV prevalence in the male population at country level is quite strong. In countries where circumcision rates are above 80%, HIV prevalence is below 7%. In countries where circumcision rates are 90% or higher, HIV prevalence is $\leq 2.2\%$, with the exception of Cameroon and Côte d'Ivoire.

In contrast, in most countries where circumcision rates are lower than 70%, HIV prevalence is over 10%, and in some cases, much higher. Here exceptions are Rwanda and Uganda: in both countries prevalence was historically much higher, and has declined significantly in recent years.⁵⁶⁻⁵⁹ The decline in Rwanda occurred in the post-war period, and levels of risk behaviour are now by far the lowest in East Africa (Table 1).

It should be noted that this analysis is 'imperfect' since, particularly in East Africa (Uganda, Kenya, Rwanda) but also to some extent in other regions (urban Burkina Faso), there have been declines in HIV prevalence in recent years. Also, rates of male circumcision may have increased somewhat in some of these countries due to diffusion of information about its efficacy in preventing HIV transmission. It nevertheless demonstrates, as in the Four Cities Study, a strong ecological association between male circumcision and rates of HIV infection.

Although there seem to be on average slightly higher levels of risk behaviour in Southern and East Africa, these differences are not as striking or consistent as the male circumcision rates (Table 1). Again this may be due to the difficulty of accurately measuring sexual behaviour, compared to the relative ease of measuring biological factors. It is also likely, as discussed above, that changes in sexual behaviour have taken place over time, particularly in high prevalence countries, so that 'current' behaviour is not a good indicator of behaviour at the time when transmission of HIV that we now see

reflected in the prevalence data was occurring. For example there is strong evidence for significant behavioural change in Uganda⁵⁷ and more recently in Zimbabwe.⁶⁰

Taken together, the evidence strongly suggests that extensive male circumcision may have decreased the relative epidemic potential in some sub-Saharan African countries, and low circumcision rates may have increased it in others, particularly where lack of circumcision coincides with other behavioural and structural risk factors. Thus male circumcision seems to be one of the most important biological factors that have influenced the pattern of HIV spread in sub-Saharan Africa.

Finally, it is interesting to note that, at least historically, the three West African countries with the highest HIV prevalence levels (Ghana, Côte d'Ivoire, Burkina Faso) had / have lower rates of male circumcision than the other West African countries.^{48, 61} Circumcision is almost universally practiced in other countries in West Africa, including Nigeria.

In addition to these biological factors, it is clear that behavioural characteristics are also important in defining the sexual networks through which the virus can be propagated. It is likely that the very rapid and extensive spread of HIV in many parts of Southern Africa has been strongly influenced by socio-economic factors such as the high rate of labour migration. Furthermore, the falling HIV prevalence levels in Uganda, and more recently in Zimbabwe, seem to have been caused mainly by reductions in risky behaviour.^{45, 57, 60}

Differences in levels of risk behaviour in countries appear to show some correlation with differences in HIV prevalence across sub-Saharan Africa. For example, Côte d'Ivoire and Swaziland have relatively high levels of risk behaviour in comparison to most other countries within West and Southern Africa, respectively (Table 1). We will further explore these behavioural factors and their importance in the epidemics in West Africa in detail in this report.

Another feature of the epidemics of HIV in West Africa is the presence of the HIV-2 strain.² Guinea Bissau, considered the epicentre and country of origin of the HIV-2 epidemic,⁶² has the highest prevalence of HIV-2 in the world, although recent data from sentinel surveillance in pregnant women and population-based surveys indicate that the progression of HIV-2 has slowed.^{63, 64} Currently about one third of HIV cases in Guinea Bissau are HIV-2.

HIV-2 has been important also in the epidemics in Cape Verde, Senegal and The Gambia – all neighbouring countries with Guinea Bissau in the North-West region of West Africa.⁶⁵⁻⁷⁰ Indeed, the first cases of HIV-2 were isolated in France in 1986, in two patients, one from Cape Verde and one from Guinea Bissau.⁶²

² HIV-2 has been identified in a blood sample from Guinea Bissau dating back to 1966 and may have been introduced as early as 1945. HIV-1 seems to have entered the population later than HIV-2, in the late 1980s.⁷¹ Older women seem to be particularly susceptible to HIV-2 infection.⁷²

In most countries, the relative importance of HIV-2 vs. HIV-1 has decreased and is continuing to do so. For example, in Guinea Bissau, from 1992 to 2004, HIV-2 prevalence among pregnant women aged 15-24 decreased from 3.6% to 1.7%, while HIV-1 prevalence increased from 1.2% to 5.7%.⁶⁴ In The Gambia, among patients attending the Medical Research Council (MRC) STI clinic, HIV-1 prevalence was 4.2% in 1988-91 and rose significantly to 17.5% in 2001-03. HIV-2 prevalence was 7.0% in 1988-91 and declined significantly to 4.0% in 2001-03.⁶⁷

The changes in the epidemiology of HIV-1 and HIV-2 infection are likely to be due at least in part to the lower transmissibility of HIV-2 compared to HIV-1. Mathematical modelling studies suggest that HIV-1 will eventually outcompete HIV-2 due to higher transmissibility.^{73, 74} Another difference is the slower progression to disease in HIV-2 infection.⁷⁵

4.2. The socio-economic context

Table 2 shows some of the main socio-economic indicators for West African countries. The total population of the 15 countries included in this review is about 270 million people, of whom about half live in Nigeria, by far the most populous country of the region. The smallest West African country is Cape Verde with less than half a million inhabitants, whereas the median population size is about 9 million (Guinea). West Africa is one of the poorest regions of the world, the five countries with the lowest human development index being in this region -- Sierra Leone, Burkina Faso, Guinea Bissau, Niger and Mali (Liberia is not ranked in this index). The most developed country of the region (Cape Verde) ranks 102nd out of 177 on this index, and the median rank is 163 (Benin). Literacy rates are very low in most countries in West Africa, with strong gender inequalities of around twice as many men as women literate in most countries.

Life expectancy at birth varies from 42 years (Sierra Leone) to 71 years (Cape Verde), with a median of 55 years (Guinea). The under-five mortality rate is extremely high at more than 100 per 1,000 live births in all countries, apart from Cape Verde, and is over 200 in five countries (Guinea Bissau, Mali, Liberia, Niger and Sierra Leone).

Most countries have a relatively high level of urbanisation (over 40% of the population of 10 countries live in urban areas), but Burkina Faso and Niger are very rural countries with more than 80% of their population living in rural areas. Islam is a very important religion in the region, with a North-South decreasing gradient: whereas Senegal, Mali, Guinea, The Gambia and Niger are essentially Muslim countries, Islam is much less present in the coastal areas of Côte d'Ivoire, Ghana, Togo, Benin and Nigeria, where Christianity and animism are dominant. The vast majority of West African men (> 95% in most countries) are circumcised, irrespective of their religion.

Table 2: Basic socio-economic and health indicators, West African countries

Variables	BF	BN	CI	CV	GA	GB	GH	GU	LI	ML	NA	NG	SL	SN	TG
Population (in thousands)	13,933	8,490	18,585	507	1,617	1,597	22,535	9,003	3,442	11,611	141,356	13,264	5,586	11,770	6,239
% iurban areas	18.3	40.1	45.0	57.3	53.9	29.6	47.8	33.0	44.7	30.5	48.2	16.8	40.7	41.6	40.1
GDP per capita (Int \$)	1,213	1,141	1,648	5,803	1,921	827	2,480	2,316	NA	1,033	1,128	781	806	1,792	1,506
Per capita total expenditure on health (Int \$)	77	40	64	225	88	28	95	96	22	54	53	26	34	72	63
Life expectancy at birth	51.4	55.4	47.4	71.0	58.8	45.8	59.1	54.8	44.7	53.1	46.5	55.8	41.8	62.3	57.8
Under-five mortality rate (per 1000 live births)	191	150	195	35	137	200	112	150	235	218	194	256	282	136	139
Male literacy rate	31.4	47.9	60.8	87.8	47.8	58.1	66.4	42.6	58.3	32.7	78.2	42.9	46.7	51.1	68.7
Female literacy rate	16.6	23.3	38.6	75.5	32.8	27.4	49.8	18.1	45.7	15.9	60.1	15.1	24.2	29.2	38.5
UNDP human development index	176/177	163	166	102	155	175	135	160	NA	173	158	174	177	156	152
% Muslim	50.0	24.4	40.0	<2.0	90.0	45.0	15.9	85.0	20.0	90.0	50.0	93.0	60.0	94.0	20.0

BF: Burkina Faso, BN: Benin, CI: Côte Ivoire, CV: Cape Verde, GA: The Gambia, GB: Guinea Bissau, GH: Ghana, GU: Guinea, LI: Liberia, ML: Mali, NA: Nigeria, NG: Niger, SL: Sierra Leone, SN: Senegal, TG: Togo

Sources: UNDP website (accessed June 4, 2008), for all indicators, except for % Muslim taken from the CIA World Fact Book (website accessed June 4, 2008) and some data on literacy rates, not available from UNDP and taken from UNAIDS/WHO Epidemiological Fact Sheets 2006.

4.3. Data sources

The most consistent data source available in all countries is from ANC sentinel surveillance. In most countries, this type of surveillance was implemented in the late 1980s or early 1990s. In many countries however, the number of ANC sentinel sites historically has been quite low and urban areas have been over-represented. In using ANC prevalence data as a proxy for HIV prevalence in the general population, the concentration of sites in urban areas has led to overestimates of the HIV epidemic in most countries, a phenomenon that has been understood only recently. Sentinel surveillance also includes STI and tuberculosis patients in many countries, with the purpose of representing additional high risk groups.

We present ANC surveillance data from country surveillance reports (or in cases where we did not have access to these, data from UNGASS reports and UNAIDS Epidemiological Fact Sheets). Where possible we quote median values, but in some cases only mean values are given, in which case we quote these. In some cases, the statistic used is not specified. Urban and rural areas are as defined in the surveillance reports: usually, a settlement with a population of 5,000 – 10,000 (depending on the country) or more is considered urban; that with a population of less than 5,000 – 10,000 is considered rural.

Over the last five years, population-based studies on HIV prevalence and related behaviours have been carried out on a representative sample of the general population of 11 countries in the region, most of these surveys being added on to a DHS (DHS+) or done using a methodology similar to the DHS. These surveys are currently the most important sources of information on the epidemiology of HIV in the general population of the countries where they were conducted. As the prevalence found in these surveys has generally been much lower than expected based on ANC sentinel surveillance data, they tend to lack power in the countries with the lowest prevalence for detailed analysis of regional and socio-demographic variations, and of risk factors for HIV. Two survey rounds have already been conducted in Niger and Mali.

With the exception of some anonymous unlinked surveys among FSWs in several countries and some research studies in the same population, especially in Côte d'Ivoire and Benin, there were very few studies carried out on prevalence and behaviour in populations at high risk of HIV infection until the mid-1990s. Since then, such studies have been carried out in almost all countries of the region, the main target populations being FSWs, truckers, men in uniform, migrants, other mobile male populations, prisoners and youth. Between 1995 and 2000, most of these studies had only a behavioural component and were identified as BSS, whereas since the beginning of the present decade, a biological component with assessment of HIV (and sometimes STI) prevalence has been added to an increasing number of surveys, such surveys being known as IBBS. A very useful set of IBBS data was collected by Projet SIDA-3 (funded by the Canadian International Development Agency, CIDA) at two different time points among FSWs and their clients in eight of the nine West African countries covered by the project.

Finally, a number of epidemiological, clinical and behavioural research studies provide valuable information, particularly about the early stages of the epidemic and about the epidemiology of HIV-2. The countries with the most active research agenda of this type have historically been Côte d'Ivoire and Ghana, as well as Senegal, The Gambia and Guinea Bissau with regards to HIV-2 epidemiology. Community-based cohort studies, such as exist in East and southern Africa, do not exist in West Africa. Data are also lacking on the prevalence and behaviours of injection drug users.

4.4. Epidemiology of HIV and related socio-demographic and behavioural factors in the general population

Figure 6 shows overall national HIV prevalence in the 11 countries of West Africa where population-based HIV prevalence studies have been carried out since 2003.²⁻¹² Details of prevalence according to sex and place of residence (rural vs. urban) are shown in Figure 7 and Table 3. (Table 3 also presents behavioural data in the general population. It includes Nigeria where a DHS, including behavioural HIV indicators but no HIV testing, was carried out in 2003.⁷⁶)

Figure 6: Map of HIV prevalence in country-wide population-based HIV prevalence studies in West Africa

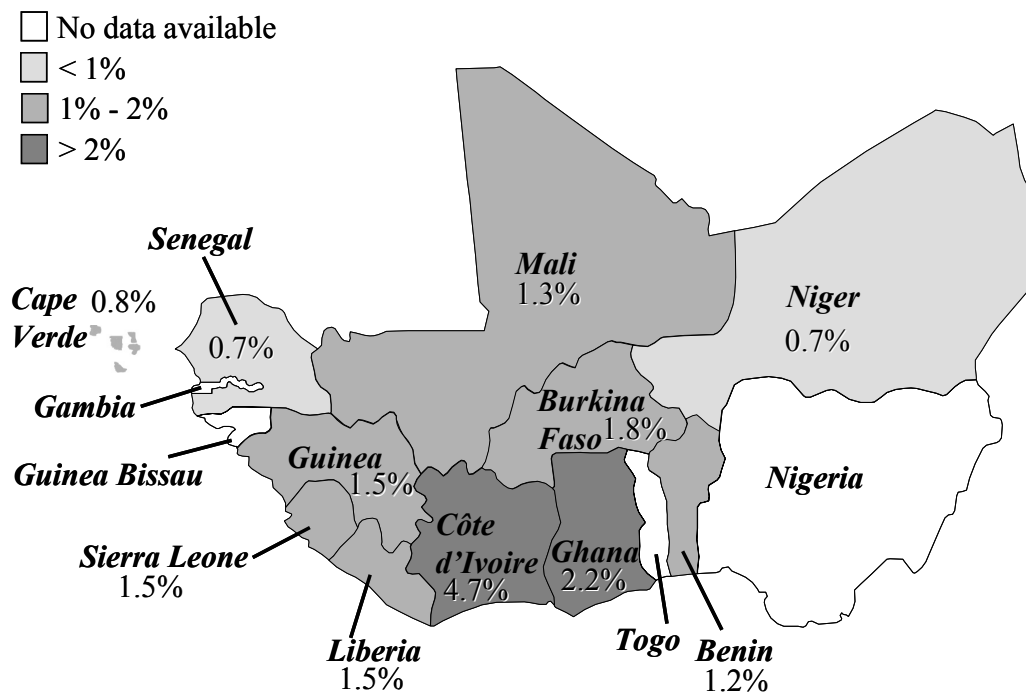


Table 3: HIV prevalence and behavioural indicators in the general population and youths of 12 West African countries with recent population-based surveys

Variables	BF	BN	CI	CV	GH	GU	LI	ML	NA	NG	SL	SN
Source and year	DHS 2003	DHS 2006	AIS 2005	DHS 2005 Pre-report data*	DHS 2003	DHS 2005	DHS 2007 Preliminary report*	DHS 2006	DHS 2003 Without HIV component	DHS 2006	Nat. pop. based HIV seroprev survey 2005*	DHS 2005
HIV prevalence - general population												
Urban Total	3.6	1.7	5.4	0.9	2.3	2.4	2.5	1.6	NA	1.4	2.1	0.7
Males	3.2	1.0	3.2	1.4	1.5	0.6	2.1	1.3	NA	1.3	1.9	0.4
Females	4.0	2.2	7.4	0.4	2.9	3.9	2.8	1.8	NA	1.5	2.2	0.9
Rural Total	1.3	0.9	4.1	0.6	2.0	1.0	0.8	0.9	NA	0.5	1.3	0.7
Males	1.4	0.7	2.5	0.7	1.4	1.1	0.6	0.6	NA	0.6	1.2	0.5
Females	1.2	1.0	5.5	0.4	2.5	0.9	1.1	1.2	NA	0.5	1.3	0.8
All Total	1.8	1.2	4.7	0.8	2.2	1.5	1.5	1.3	NA	0.7	1.5	0.7
Males	1.9	0.8	2.9	1.1	1.5	0.9	1.2	1.0	NA	0.7	1.5	0.4
Females	1.8	1.5	6.4	0.4	2.7	1.9	1.8	1.5	NA	0.7	1.6	0.9
Behavioural indicators among people aged 15-49												
Sex with >1 partner last 12 months												
Males	23.5	27.4	30.5	NA	9.9	NA	21.6	22.8	NA	NA	35.7	NA
Females	1.8	0.9	4.5	NA	1.1	NA	7.1	1.5	NA	NA	9.3	NA
Extra-marital sex												
Males	13.7	14.5	25.1	NA	15.7	26.8	NA	14.0	14.6	1.9	NA	21.4
Females	1.2	0.6	4.8	NA	3.7	4.8	NA	4.2	1.3	0.1	NA	3.8
Condom use in last extra-marital sex												
Males	68.3	37.4	51.6	NA	39.0	43.8	NA	40.6	50.7	37.8	NA	63.7
Females	34.1	10.7	16.5	NA	15.4	26.1	NA	15.8	6.2	NA	NA	39.2
Paid for sex last 12 months												
Males	NA	1.7	2.2	NA	1.5	1.2	NA	2.0	2.9	1.3	NA	NA
Females	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

* Limited behavioural data available from the reports currently available for these countries.

Table 3. HIV prevalence and behavioural indicators in the general population and youths of 12 West African countries with recent population-based surveys (continued)

	BF	BN	CI	CV	GH	GU	LI	ML	NA	NG	SL	SN
Source and year	DHS 2003	DHS 2006	AIS 2005	DHS 2005 Pre-report data*	DHS 2003	DHS 2005	DHS 2007 Preliminary report*	DHS 2006	DHS 2003 Without HIV component	DHS 2006	Nat. pop. based HIV seroprev survey 2005*	DHS 2005
Behavioural indicators among youth aged 15-24												
% Ever married or cohabiting												
Males	11.0	9.9	8.8	NA	9.7	14.5	NA	24.0	18.5	15.0	NA	12.0
Females	54.0	47.5	37.4	NA	52.6	55.4	NA	71.0	70.2	72.0	NA	45.0
Unmarried youth had sex last 12 months												
Males	31.9	40.5	56.1	NA	23.9	52.9	NA	15.9	28.7	10.1	NA	20.9
Females	26.3	37.5	57.8	NA	30.0	35.6	NA	8.1	31.6	1.9	NA	2.1
Condom use last sex among unmarried youth who had sex last 12 months												
Males	66.4	46.6	53.5	NA	51.5	35.0	NA	35.8	46.5	NA	NA	52.4
Females	55.5	27.8	41.0	NA	34.9	25.7	NA	20.5	25.3	NA	NA	36.0
Females 15-19 who had extra-marital or pre-marital sex last 12 months with man > 10 years older	NA	10.0	31.0	NA	5.2	5.9	NA	NA	11.6	NA	NA	NA

* Limited behavioural data available from the reports currently available for these countries.

BF: Burkina Faso, BN: Benin, CI: Côte Ivoire, CV: Cape Verde, GA: The Gambia, GB: Guinea Bissau, GH: Ghana, GU: Guinea, LI: Liberia, ML: Mali, NA: Nigeria, NG: Niger, SL: Sierra Leone, SN: Senegal, TG: Togo

Table 4: HIV prevalence (%) in ANC sentinel sites, general population studies, high risk groups in 15 West African countries

Variables	BF	BN	CI	CV	GA	GB	GH	GU	LI	ML	NA	NG	SL	SN	TG
ANC HIV prevalence	2006	2006	2005	2004	2006	2004	2006	2004	2006	2005	2005	2006	2006	2004	2006
Urban	3.8	2.8	6.9			6.7	3.5	4.1	5.5	3.9	4.6		4.9		5.0
Rural	1.0	1.5	4.0				2.8	4.3		2.5	3.9		2.5	-	2.7
Total	2.7	2.0	5.8	0.44	2.8	6.7	3.2	4.2	5.5	3.4	4.4	1.9^a	4.1	1.7^b	4.2
DHS pop-based HIV prev	2003	2006	2005	2005			2003	2005	2007	2006		2006	2005	2005	
Urban	3.6	1.7	5.4	0.9			2.3	2.4	2.5	1.6	DHS	1.4	2.1	0.7	
Males	3.2	1.0	3.2	1.4			1.5	0.6	2.1	1.3	2003	1.3	1.9	0.4	
Females	4.0	2.2	7.4	0.4			2.9	3.9	2.8	1.8	without	1.5	2.2	0.9	
Rural	1.3	0.9	4.1	0.6			2.0	1.0	0.8	0.9	HIV	0.5	1.3	0.7	
Males	1.4	0.7	2.5	0.7			1.4	1.1	0.6	0.6	compo	0.6	1.2	0.4	
Females	1.2	1.0	5.5	0.4			2.5	0.9	1.1	1.2	Nent	0.5	1.3	0.9	
Total	1.8	1.2	4.7	0.8			2.2	1.5	1.5	1.3		0.7	1.5	0.7	
Males	1.9	0.8	2.9	1.1			1.5	0.9	1.2	1.0		0.7	1.5	0.4	
Females	1.8	1.5	6.4	0.4			2.7	1.9	1.8	1.5		0.7	1.6	0.9	
HIV prevalence in high risk populations															
Female Sex Workers - FSWs	16.0 (2005)	25.5 (2006)	16.0 (2006-7)		21.3 (2003)	25.9 (2007)	34.7 (2006)	34.4 (2007)		35.3 (2005)	34.0 (2007)	33.9 (2006)	8.5 (2005)	19.8 (2006)	45.4 (2005)
Clients	1.6 (2005)	4.3 (2005)	13.4 (1999)				16.0 (2001)	4.3 (2006)				2.2 (2005)		2.4 (2006)	7.7% (2005)
MSM							25.3 (2006)				13.5 (2007)			21.5 (2005)	
Truck workers	18.6 (1994)	1.5 (2005)					3.2 (2006)	5.5 (2007)		2.5 (2005)	3.7 (2007)	1.7 (2002)		1.4 (2006)	
Prisoners	9.1 (1998)	4.0 (2004)	27.8 (1995)				19.2 (2004-5)				8.8 (2002)	2.8 (2002)			
Men in uniform Military Policemen	3.0 (2006)							6.5 (2007)			(2007)	3.8 (2002)		(2006)	9.5 (2006)
Fishermen								5.0 (2007)						1.0 (2006)	
Miners							0.9 (2007)	5.2 (2007)				2.1 (2004)			
IDUs				14.3 (2007)							5.6 (2007)				

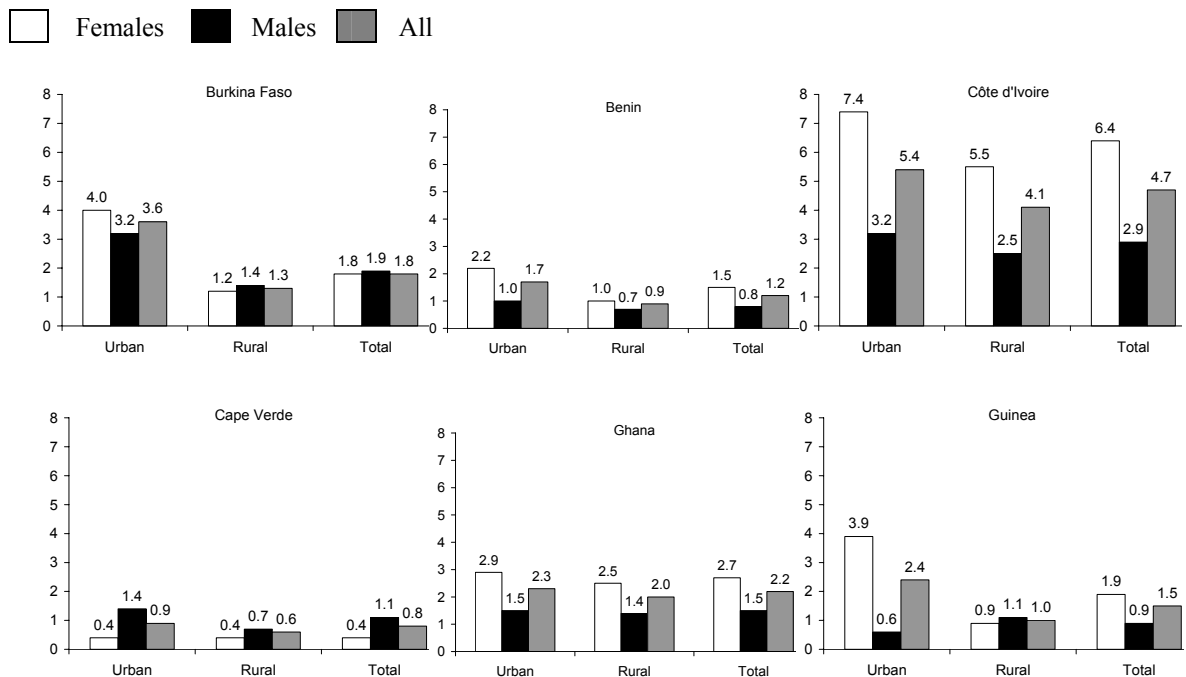
^a Based on HIV screening in clinical settings because most recent ANC sentinel data are from 2002. ^b Mostly from urban areas

4.4.1. Geographical distribution of HIV in population-based studies

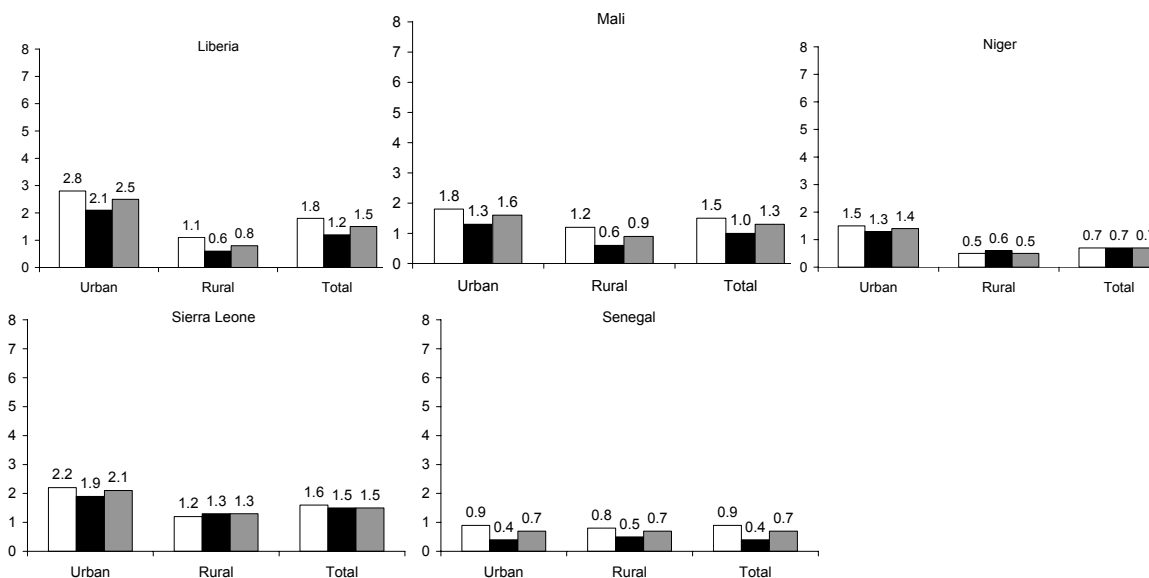
In nine of the 11 countries, overall national HIV prevalence from the population-based surveys is < 2% (< 1% in three countries: Cape Verde, Senegal and Niger), whereas it is 2.2% in Ghana and 4.7% in Côte d'Ivoire. In the four countries without population-based data, the estimates based on ANC data are generally higher, varying from 2.8% in The Gambia to 6.7% in Guinea Bissau (Table 4). Given that ANC prevalence is significantly higher than population-based HIV prevalence in all countries where both types of data are available (Table 4), it is also likely that the true population prevalence is lower than the ANC estimates in Nigeria, Togo, The Gambia and Guinea Bissau. In the latter country, which is considered as the epicentre of the HIV-2 epidemic, about one third of HIV cases are HIV-2, and HIV-1 ANC prevalence is 4.8%. Whereas the proportion of HIV-2 among HIV cases has decreased significantly in most other West African countries to the point of being negligible, HIV-2 infection is still also important in Senegal, Cape Verde and The Gambia. In the latter country, HIV-2 represented about one third of the HIV cases identified in ANC surveillance in 2004, whereas HIV-2 accounted for about half, and 25% of cases in the 2005 Cape Verde and Senegal general population surveys,.

HIV prevalence is at least 1.3 times higher (and usually at least two-fold higher) in urban than in rural areas (Table 3 and Figure 7) in all countries where data are available, apart from Senegal and Ghana. Six of the 11 countries with population-based HIV prevalence estimates have a prevalence of < 1% in rural areas.

Figure 7: HIV prevalence (%) by area of residence (urban vs. rural) and gender in the general population of 11 West-African countries



(continued on next page)



4.4.2. Gender distribution of HIV in population-based studies

The countries fall into three categories with regards to the female: male ratio of HIV prevalence: a ratio between 1.5 and 2.25 (Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Mali and Senegal); a ratio close to one (Burkina Faso, Niger and Sierra Leone); and Cape Verde, the only country with a strong predominance of cases among men. In some countries, such as Benin and Guinea, the female: male ratio is much higher in urban than in rural areas, with an extreme of 6.5 in Guinea, and a very uneven ratio of 5.6 in Cotonou, the largest city of Benin, where prevalence is 2.8% among women and 0.5% among men.

There has thus clearly been a feminisation of the epidemic in most West African countries, as indicated by a dramatic increase in the female: male ratio in countries where data from early general population studies are available. For example, the female: male ratio was 0.63 in a general population study carried out in Côte d'Ivoire in 1987, and around 1 in a general population study carried out in Cotonou in 1998. This feminisation is related to the maturation of the epidemic in most countries with a high female: male ratio. There is evidence that HIV prevalence has reached a peak and may even have started to decline in several countries, including Côte d'Ivoire, Benin, Ghana, Mali and Senegal. Nevertheless, the very high relative (Cotonou, urban Guinea) and absolute (Côte d'Ivoire) differences between HIV prevalence in men and women may partly be explained by participation biases. Indeed, whereas participation in the recent general population surveys was generally good (> 80%) in all countries (although slightly lower in men than in women), it was significantly lower among men of the capital / main cities of Abidjan (< 60%), Conakry (68%) and Cotonou (66%). Country-level analysis of characteristic and predicted prevalence in non-participants suggests that overall bias in the estimates is relatively small.⁷⁷ However there is always the possibility of residual bias, plus the possibility that sub-national level bias, for example in major / capital cities where response rates tend to be lower than country response rates, may be greater. In any event, the small sample size in the main / capital cities makes it difficult to draw any firm conclusions.

AIDS case reporting data, where available, also indicate a feminisation of the epidemic. For example, in Ghana, the female: male ratio of reported cases increased three-fold from 0.5:1 in 1998 to 1.44:1 in 2005.

4.4.3. Comparison of ANC and population-based HIV prevalence data

Table 4 shows ANC prevalence in all 15 West African countries,^{64,78-91} in parallel with population-based HIV prevalence estimates where available. In most countries with both types of data available, ANC prevalence is higher than the population-based estimates combining both men and women. This is in part due to the much lower prevalence found in men, compared to women, in most general population studies. Indeed, when limiting the comparison to women, the difference is much smaller in several countries: 1) In Burkina Faso and urban Guinea, the rural / urban specific ANC prevalence is comparable to those found among women in the DHS surveys; 2) In Côte d'Ivoire and Cape Verde, ANC prevalence is in fact *lower* than the population-based estimates for women in both rural and urban areas; 3) In Benin and Ghana, the differences between the prevalence obtained in the two survey types are much reduced when considering women only. However, in rural Guinea, Liberia, Mali, Niger, Sierra Leone and Senegal, ANC prevalence estimates remain much higher than population-based prevalence estimates among women.

The differences between ANC and population-based prevalence among women tend to be smaller in countries with a large number of ANC sentinel sites and broad coverage of rural areas (Benin, Ghana) than in countries with a limited number of sites. In Burkina Faso, although the rural / urban ANC estimates are comparable to those of the general population of women, the estimate of ANC prevalence at the national level is higher than the population-based estimate for women because of under-representation of rural areas in the sentinel sites in this country which is the least urbanised of West Africa (only 18.3% of the population lives in urban areas). In other countries with large differences between the two types of surveys for rural / urban specific estimates (e.g. Mali), the sentinel sites tend to represent the most accessible localities and do not cover remote areas.

The remaining differences between population-based and ANC estimates among women for countries like Ghana and Benin are likely due to the fact that a significant proportion of women aged 15-49 are not sexually active (25% in Benin and 32% in Ghana reported no sexual activity in the last year), especially at the two extremes of this age group, as well as to differences in the age distribution of pregnant and non-pregnant women. It is interesting to note that, in the Ghana DHS, HIV prevalence among women who were pregnant or had been so in the two years preceding the survey was similar to that found in ANC sentinel surveillance. Finally, in Côte d'Ivoire, the (unusual) higher prevalence found among women in the general population survey, when compared to the ANC data, may be due to lower fertility of women with HIV in the context of a more advanced and widespread epidemic in this country, compared to the rest of West Africa.^{92, 93}

Given these observations on the comparison between ANC and population-based prevalence in countries where both types of data are available, it is likely that the ANC

prevalence in the four countries of the region without population-based HIV prevalence studies (Togo, Nigeria, Guinea Bissau and The Gambia, which, apart from The Gambia, all have ANC prevalence > 2%,) is higher than the true general population prevalence.

4.4.4. Sexual behaviour indicators in the general population and youth

Table 3 also shows key behavioural indicators in the adult population and youth from the same general population surveys as those from which the HIV prevalence estimates were obtained (for Nigeria, the data are from the 2003 DHS without an HIV component). Some of the general population survey reports we accessed were preliminary and focused on HIV prevalence; hence the absence of these indicators for Cape Verde, and their very limited availability for Liberia and Sierra Leone. In addition, there were no recent (within five years) behavioural indicators available for the general population from the other countries (Togo, Guinea Bissau and The Gambia) included in this review.

There is also an important limitation to the behavioural indicators used in most surveys. The main indicator used for assessing sexual risk behaviour in youth and adults in population-based surveys, as defined by UNAIDS / UNGASS and used in all DHS and Multiple Indicator Cluster Survey (MICS) standard reports, is ‘higher-risk sex’ – defined as sex with a non-marital and/or non-cohabiting partner.¹³ This is unfortunate since this variable is not a good measure of sexual risk behaviour in unmarried youth / adults. By definition, sex with *any* sexual partners with whom the interviewee is not in union (defined as married / cohabiting) is considered as higher-risk sex. While for people in union this equates to extra-marital sex (and is thus adequate as a measure of risk), for people not in union, this would mean any sex, including with a regular partner who is not cohabiting. For sexually active adults not in union, this variable has a value of 100% by definition. Consequently, if the proportion of the population engaging in ‘higher-risk sex’ is presented for the whole population (i.e. not differentiated by whether or not in union), very high and unrealistic rates of ‘higher-risk sex’ are obtained.

The problem related to this indicator is more serious for youth, fewer of whom are married than among older people. Similarly, among unmarried subjects, the measure ‘condom use at last higher-risk sex’ is of limited utility since it is equivalent to condom use at last sex with any type of partner, and includes all types of partners – from a sex worker to a regular long-standing boyfriend or girlfriend. Consequently, we purposefully did not present this indicator in Table 3, except to specifically represent extra-marital sex among married / cohabiting people. The use of this indicator as the main marker for risky sexual behaviour also resulted in the absence of a much more useful indicator (number of sexual partners) from many published reports of general population surveys. Finally, in secondary use of this indicator, it has often been misinterpreted as meaning sex with a non-regular or casual partner.

In the 2008 revision of the UNGASS core indicators, the definitions of these two indicators have been revised.⁹⁴ Higher-risk sex (indicator 16) is now defined as sex with more than one partner in the last year. This is an improvement but will result in non-comparability of

data over time. With the new definition, the indicator will be lower and could artificially indicate a reduction in sex with more than one partner over time.

The new definition of condom use in higher-risk sex (indicator 17) is not useful, since it is defined as 'condom use during last sex' among people who have had more than one partner during the last year. However the partner type is not defined and could therefore be either a regular / spousal or casual partner, depending on when the person is interviewed in relation to their last sex act.

Men reported having had more than one sexual partner in the last year much more frequently than women (three to 15 times more in the five countries for which this indicator is available), and married/cohabiting men reported extra-marital sex four to 23 times more than their female counterparts. Extra-marital sex was by far the least frequent in Niger (reported by only 1.9% of men and 0.1% of women), whereas it was more frequent at 25-26% of men and 4.8% of women in Côte d'Ivoire, the country with the highest prevalence in West Africa, and in Guinea, which has one of the highest prevalence among women in urban areas. Condom use at last extra-marital sex was also much higher among men, and was higher in Burkina Faso and Senegal than in any other country for both men (60-70%) and women (30-40%) -- in other countries, it varied between 37% and 52% among men, and between 6% and 26% among women. There was a particularly large differential between men and women for this indicator in Nigeria (51% among men and 6% among women).

Among youth aged 15-24, a much greater proportion of women were married (37.4% in Côte d'Ivoire to 72% in Niger) than men (from 8.8% in Côte d'Ivoire to 24.0% in Mali). Consequently, young women were more often sexually active than young men, when data were not broken down by marital status. However, with the exception of Ghana and Côte d'Ivoire, unmarried male youth were more often sexually active than their female counterparts. Pre-marital sex among youth was much less frequent in countries with $\geq 90\%$ Muslims, including Mali, Senegal and Niger. Over 50% of unmarried youth of both sexes were sexually active in Côte d'Ivoire, the highest figures of all in a West African country, especially for young single women. Condom use at last sex among unmarried young men was higher than among young women, but the gender differential was less pronounced than for condom use during last extra-marital sex in the 15-49 population. Of the few countries where information on the age differential between young girls aged 15-19 and their extra- or pre-marital partners was available, young girls in Côte d'Ivoire reported having sexual partners more than 10 years older than they were far more frequently than in the other countries (31% compared to 5-12% in four other countries).

Although there is not a clear overall ecological pattern between levels of HIV-related sexual risk behaviour and HIV prevalence when looking across all West African countries, one can identify a combination of high risk behaviours that may explain, at least in part, the much higher prevalence in the general population of Côte d'Ivoire, compared to the other countries. Indeed in this country, the proportions of men and women reporting more than one partner in the last year, of extra-marital sex among married people, of sexual activity among unmarried youth, and of a large age differential between sexually active girls aged

15-19 and their male partners, are among the highest of all countries, whereas condom use remains sub-optimal. Lack of data on key behavioural indicators in several country reports however limits any detailed examination of the ecological relationship between HIV prevalence and levels of risky behaviour across countries. Another very important factor is the time dimension. The epidemic grew in many countries during the 1980s and early 1990s, so when seeking explanations for different peak prevalence rates in different countries, ideally behavioural data for these time periods should be compared. However such data were not collected early-on and current behaviours may be different from those that existed during the 1980s.

The proportion of men reporting having paid for sex in the last year in Côte d'Ivoire is however comparable to that of other countries at 2.2% (compared to 1.3 to 2.9% elsewhere). There are reasons to think that this indicator is grossly underestimated, due to social desirability and selection biases. Indeed, given much more frequent extra- and pre-marital sex among men and their higher level of condom use when compared to women, it is difficult to understand with whom all these men have sex with condoms, if it is not with FSWs, who represent a relatively small number of women (generally between 0.5 and 1.5% in West African settings for which this information is available), but with a very high number of sexual partners and high levels of condom use (see also details in the case study on Benin, section 5). In addition, it is plausible that men who declined participation in the surveys or were not included because they were always absent from the household are more frequent consumers of commercial sex than those who participated in the surveys.

4.4.5. Knowledge, attitudes and HIV testing indicators in the general population

Table 5 shows knowledge, attitudes and HIV testing indicators from general population surveys in 11 of the 12 countries (only results from the HIV component of the 2005 Cape Verde survey were available to us) where such studies have been conducted in the last five years. There are other studies on such indicators in the general population of some of the same countries, but we chose to present these ones because they were collected in surveys with comparable methodologies. Unfortunately, recent data on similar indicators are not available for the other countries covered by this review.

Knowledge of condoms as a method to prevent HIV sexual transmission was systematically higher by 10-20% among men compared to women in all countries, with the exception of Senegal where it was around 74% for both men and women. This indicator is highest in Benin for both men and women and surpasses 80% among men in two other countries, Ghana and Guinea. Knowledge of condom as a prevention method does not reach 50% among women from three countries (Burkina Faso, Liberia and Nigeria).

Table 5: Knowledge, attitudes, and HIV testing indicators from general population studies in 11 West African countries

Variables	BF 2003	BN 2006	CI 2005	GH 2003	GU 2005	LI 2007	ML 2006	NA 2003	NG 2006	SL 2005	SN 2005
Know that using condoms can protect against HIV											
Males	65.9	85.1	74.4	82.1	82.1	71.2	70.3	63.4	67.2	65.1	74.0
Females	48.4	74.2	60.4	72.9	71.0	49.8	57.2	44.6	55.2	54.2	73.8
Know that the risk of mother-to-child transmission of HIV can be reduced by mother taking drugs during pregnancy										64.6	
Males	47.0	32.5	42.5	15.9	16.0	NA	29.4	7.5	31.5	(No gender precision)	26.3
Females	49.0	28.9	43.7	15.9	9.7	NA	24.5	6.1	15.9		28.1
% of youth aged 15-24 who know where to obtain male condoms											
Males	71.0	76.9	86.8	80.5	69.3	NA	41.2	58.1	27.7	NA	68.6
Females	46.7	38.4	59.7	64.3	43.4	NA	24.8	24.0	9.4	NA	46.4
Willing to care for a family member with HIV/AIDS at home											
Males	80.9	79.1	85.8	72.0	71.1	NA	88.7	39.9	79.4	NA	83.4
Females	75.5	56.4	82.6	68.4	47.2	NA	72.0	43.8	56.3	NA	70.9
Would buy fresh vegetables from a vendor with HIV/AIDS											
Males	NA	36.7	52.3	35.9	20.8	NA	36.7	28.2	31.2	NA	36.1
Females	NA	27.5	45.4	25.6	8.5	NA	26.2	19.6	15.4	NA	26.4
Tested for HIV last 12 months and know test results											
Males	NA	4.8	3.2	3.2	2.9	NA	2.7	5.9	1.6	NA	1.5
Females	NA	6.5	3.7	2.3	1.1	NA	3.1	3.0	0.9	NA	1.0
Tested for HIV ever and know test results											
Males	NA	10.3	7.9	7.5	6.0	NA	6.4	13.6	3.9	5.6	4.2
Females	NA	15.1	10.9	7.4	2.1	NA	6.6	6.4	1.9	6.2	2.7
Pregnant women counselled about HIV during pre-natal visit (among those who gave birth in the past 2 years)											
Males	NA	25.6	14.0	43.3	6.5	NA	11.0	24.3	6.9	NA	6.0
Females	NA	12.2	7.3	3.3	0.7	NA	4.3	NA	1.2	NA	2.5

BF: Burkina Faso, BN: Benin, CI: Côte Ivoire, CV: Cape Verde, GA: The Gambia, GB: Guinea Bissau, GH: Ghana, GU: Guinea, LI: Liberia, ML: Mali, NA: Nigeria, NG: Niger, SL: Sierra Leone, SN: Senegal, TG: Togo

In all countries, young men knew where to obtain condoms much more often than young women, and it was in the countries with the highest national HIV prevalence, Côte d'Ivoire and Ghana, that this indicator was highest (around 80% among male youth and 60% among female youth). This indicator was particularly low in Niger (around 28% in young men and 9% in young women).

Prevention of mother-to-child transmission (PMTCT) by drugs is much less known than condom use and does not reach 50% in any country, except in Sierra Leone. The information is not broken down by sex in the data available from Sierra Leone, but in most countries, this indicator is about at the same level in both men and women. It is particularly low in Guinea and Nigeria.

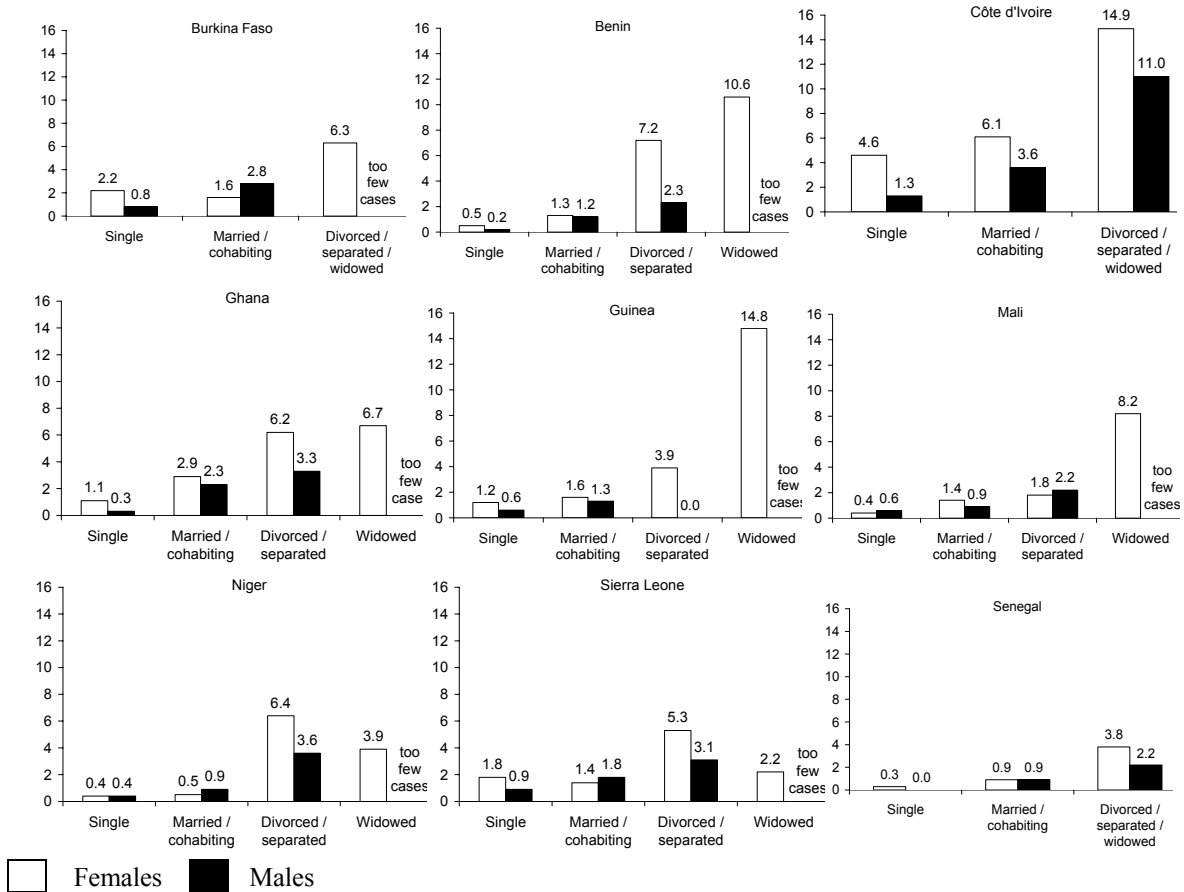
With regards to attitudes, HIV/AIDS is still highly stigmatized in West Africa. Indeed, in most countries 20-30% of men and > 30% of women would not agree to care for a family member with HIV/AIDS at home, and the vast majority of people would not buy fresh vegetables or fruits from a vendor with HIV/AIDS. Nigeria scores particularly low on the first indicator, with less than 4% of both men and women who would agree to care for an HIV-infected family member, whereas the second attitude indicator is particularly low in Guinea. People from Côte d'Ivoire have the most positive attitudes towards people with HIV/AIDS. This could be related to the higher HIV prevalence in this country compared to all other West African countries, making more usual the presence of people with HIV/AIDS in everyone's life.

HIV testing indicators are low in all countries, but generally higher in Benin than in the other countries: it is only in Benin that over 10% of both men and women report ever having been tested for HIV and knowing their test results, and that over 10% of pregnant women were tested for HIV during their pregnancy and received their result. There is a much wider gap in Ghana than in the other countries between the proportions of pregnant women counselled (43.3%) and the proportion actually tested (3.3%). HIV testing indicators are particularly low in Niger, Senegal and Guinea. It has to be noted that there are limitations in the comparison of HIV testing indicators across countries, because the general population surveys were not all carried out during the same year and there have been major efforts to scale up VCT and PMTCT services in recent years.

4.4.6. Factors associated with HIV in the general population

Figure 8 shows HIV prevalence according to marital status in nine countries where such data are available from the general population HIV prevalence study reports. There is a clear association between HIV prevalence and being divorced / separated and/or widowed, especially among women. In most countries, there were too few widowed men to assess the association with HIV. With the exception of single women in Burkina Faso and Sierra Leone, among whom HIV prevalence was higher than in married / cohabiting women (Figure 8), HIV prevalence was systematically lowest among single people.

Figure 8: HIV prevalence (%) by marital status and gender in the general population of nine West-African countries¹



¹ This information was not available for two of the 11 West-African countries with general population-based data available.

Figure 9 shows HIV prevalence according to educational level in nine countries where such data are available from the general population HIV prevalence study reports. There is no uniform pattern in the association between education and HIV across the countries. Whereas the most educated group of women had the lowest prevalence in Benin, Ghana, Mali and Senegal, HIV prevalence was lowest among women with no education in the other countries represented in Figure 9. Among men, HIV prevalence was highest among the most educated in Burkina Faso, Côte d'Ivoire, Liberia and Mali, and lowest for the same educational level in Ghana and Senegal. There was no clear pattern in the association between education level and HIV prevalence among men in the other countries.

Figure 10 shows HIV prevalence by wealth in six countries where data are available from the general population HIV prevalence study reports. There is a clear association between HIV and living in the wealthiest households among women of all countries shown, except Benin. This pattern is much less clear among men except for Mali. HIV prevalence is highest among the poorest men in Guinea, which results in a completely

reversed trend in the association between HIV and wealth when comparing men and women.

Figure 9: HIV prevalence (%) by education level and gender in the general population of nine West-African countries¹

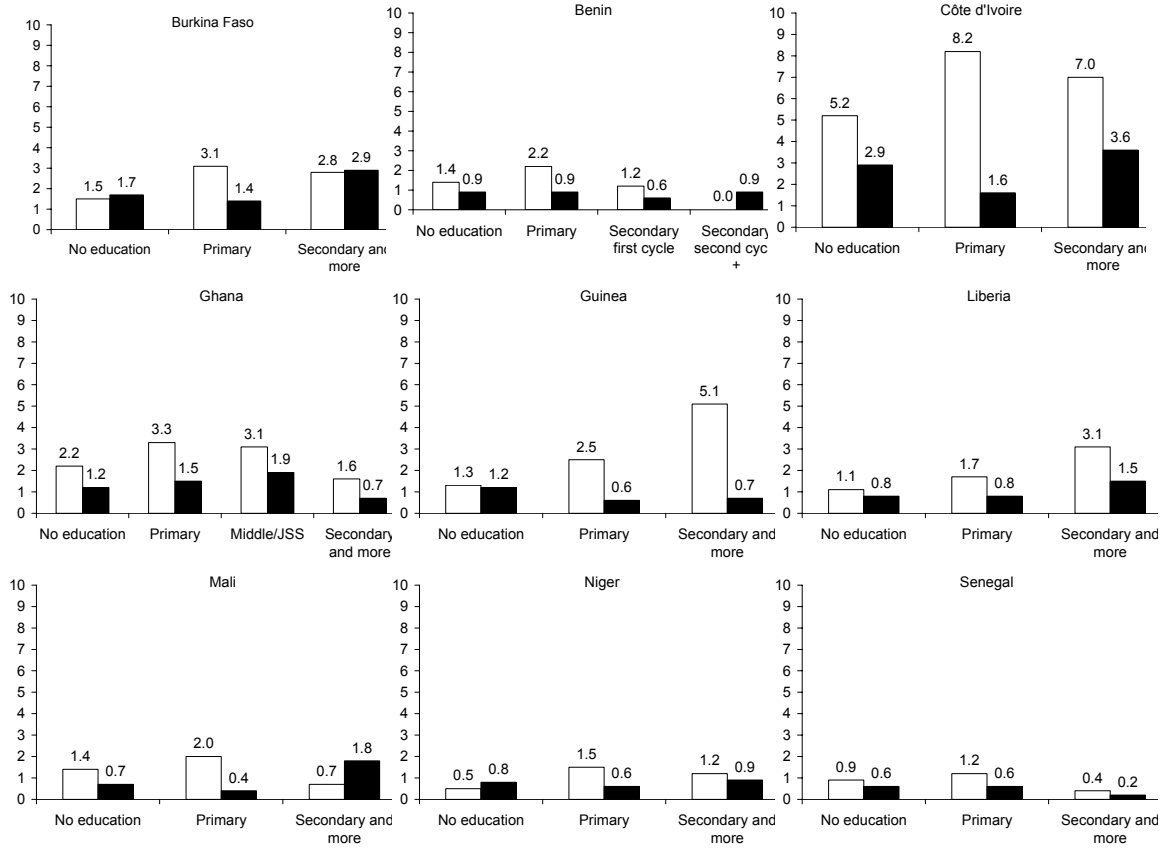
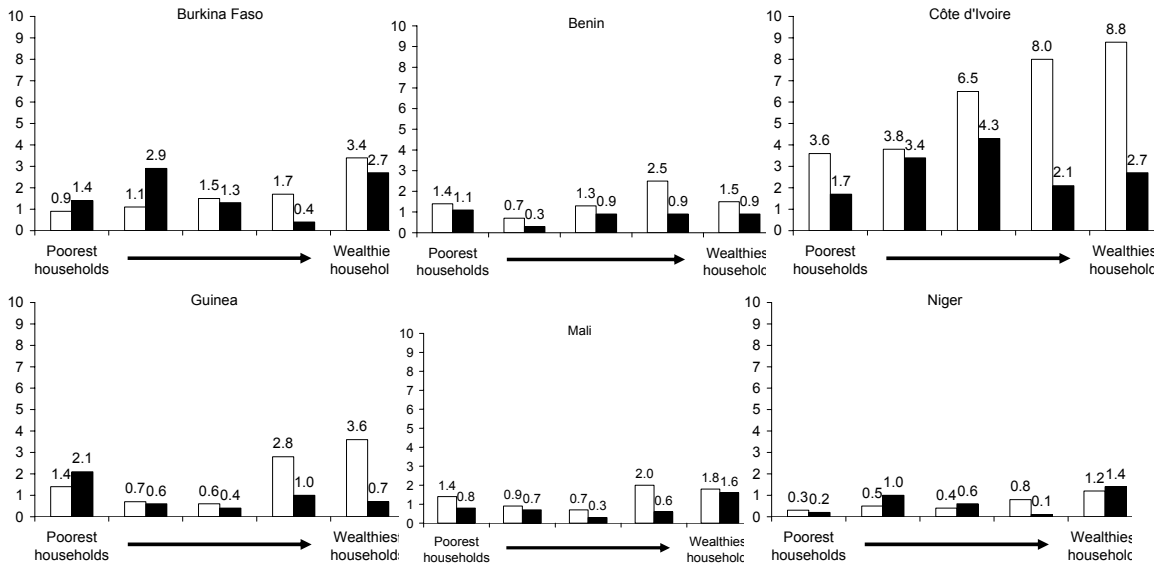


Figure 10: HIV prevalence (%) by wealth and gender in the general population of six West-African countries¹

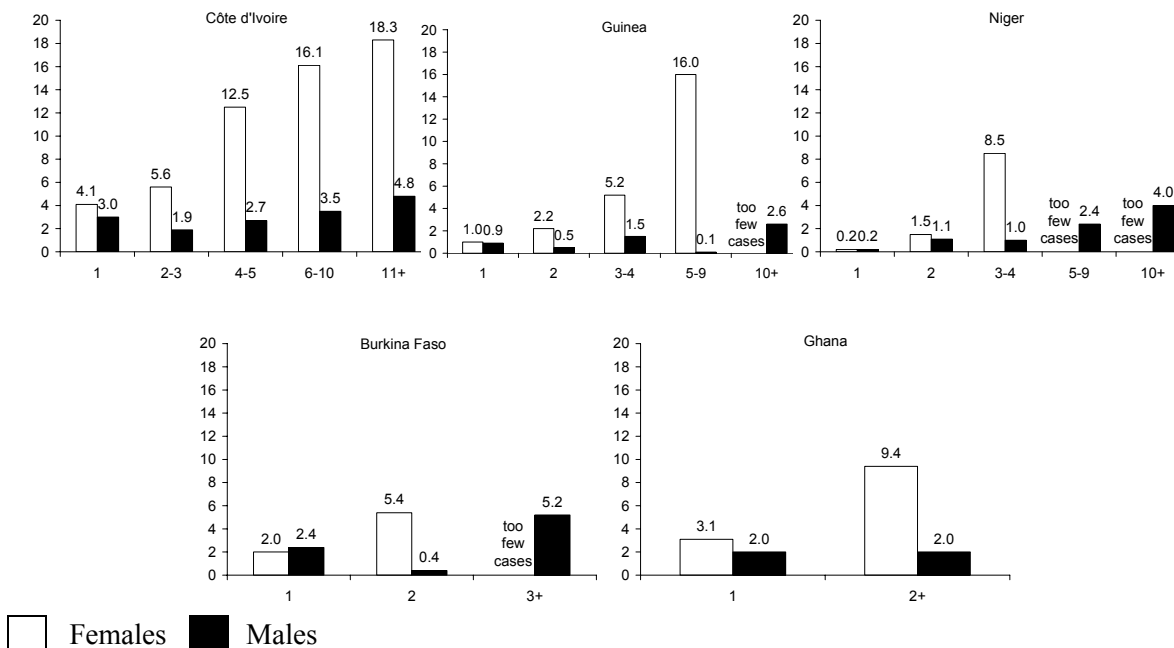


¹ This information was not available for the rest of the 11 West-African countries with general population-based data available.

□ Females ■ Males

Unfortunately, as mentioned above, the number of sexual partners has not so far been considered as a key behavioural indicator and has not been reported in relation to HIV status in many of the recent population-based HIV prevalence study reports from West Africa. In the five countries where the association between this factor and prevalent HIV was assessed, it proved to be one of the strongest predictors of infection (Figure 11). Indeed, in the three countries where the number of lifetime partners was related to HIV (Côte d'Ivoire, Guinea and Niger), there was a significant trend between increasing number of partners and HIV prevalence levels. For example in Guinea, HIV prevalence was 16 times higher among women with five to nine lifetime partners than among those with one lifetime partner, and in Niger, HIV prevalence was 20 times higher among men with 10 partners or more compared to those with one lifetime partner. In Ghana and Burkina Faso, the analysis that was carried out concerns the association between HIV infection and the number of sexual partners in the last year. In Ghana, there was no association among men, but having had two partners or more in the last year was strongly associated with HIV among women, whereas among men from Burkina Faso, having had three partners or more in the last year was also associated with HIV. In Ghana, there was however a significant association between having sex with a FSW and HIV infection among men (7.3% vs. 1.9%, $p < 0.01$). The higher HIV prevalence in FSW clients is further discussed in section 4.5.

Figure 11: HIV prevalence (%) by number of partners and gender in the general population of five West-African countries¹



¹ This information was available for only five of the 11 West-African countries with general population-based data available. Number of partners was defined as the number of lifetime sexual partners, with the exception of Burkina Faso and Ghana where it was the number of sexual partners in the last year.

The scope and quality of risk factor analyses in currently available reports vary greatly between the different general population studies. Risk factors specifically identified in some of these studies will be presented, where appropriate, in the country-specific sections which follow.

An important limitation of the above analyses is that they consider only one variable at a time. For example, urban / rural status has been shown to confound the association between household wealth and HIV status.⁹⁵ The other limitation is that the above analyses link current behaviours (often during the 12 months prior to interview) to prevalent infections, whereas it is likely that most of these infections were acquired more than 12 months before the survey. While indicators of recent behaviour (e.g. in the last year) are important for tracking behavioural change over time, indicators of past / lifetime behaviour could be more useful for analysing associations with prevalent infections.

Table 6: HIV infection among couples in seven West African countries where data are available from studies on HIV prevalence in the general population

Variables	BF	BN	CI	GH	GU	ML	NG
Nb. of couples tested	2,237	2,774	1,044	1,792	1,873	2,538	2,301
% with both man and woman seronegative	98.2	98.0	92.6	95.8	97.8	98.5	98.8
% with both man and woman seropositive	0.3	0.2	1.4	1.0	0.4	0.4	0.2
% with man only infected	0.7	0.9	2.3	1.6	1.0	0.3	0.6
% with woman only infected	0.7	0.9	3.7	1.5	0.7	0.8	0.4
% of couples with HIV that are serodiscordant	82.3	90.0	81.1	75.6	81.0	73.3	83.3
% knowing HIV status among HIV positive	9.1	23.5	16.5	11.7	5.4	12.9	9.4
	Men only						
Female-to-male ratio of HIV prevalence among:							
Couples	1.00	1.00	1.38	0.96	0.79	1.71	0.75
Serodiscordant couples	1.00	1.00	1.60	0.94	0.70	2.67	0.67
Overall general population	0.95	1.88	2.21	1.80	2.11	1.50	1.00

BF: Burkina Faso, BN: Benin, CI: Côte Ivoire, GH: Ghana, GU: Guinea, ML: Mali, NG: Niger,

4.4.7. HIV in couples

Table 6 shows HIV prevalence among couples in seven West African countries, for which these data were reported from recent population-based studies. In all countries, the

vast majority of couples (from 73 to 90%) where at least one spouse is infected are serodiscordant. It would be expected that women are more often the person infected in HIV-discordant couples, given the higher HIV prevalence observed in women than men in most countries. This is however the case in only two countries, Côte d'Ivoire and Mali. Apart from the latter country and Burkina Faso (where there is no difference), the female: male ratio of HIV prevalence among couples is much lower than that observed in the general population. In Guinea, there is even a radical shift, with a female: male ratio of 2.11: 1 in all subjects participating in the DHS, compared to 0.79: 1 among couples. These observations hold even when looking at the female: male ratio only among discordant couples. This indicates that HIV-positive women are less often in couples than HIV-positive men, which is borne out by the higher prevalence seen among widowed / divorced / separated than married women.

Despite this, it has been suggested that the relatively high frequency of discordant HIV+ females in couples may be due to infection through extra-marital relationships,^{96, 97} although the proportion of women reporting extra-marital sex is much lower than men (Table 3). It has been suggested that social desirability bias results in significant under-reporting of extra-marital sex among women.⁹⁶

In addition to the fact that the proportion of women among HIV-infected respondents in couples is lower than in the general population, analyses carried out on the Ghana data suggest that in a high proportion of the couples, the woman is likely to have been infected *before* the current marriage, either in a previous marriage or prior to marriage.⁹⁶ Being in successive marriages is a risk factor for HIV in women. The very high rate of male circumcision in West Africa would result in a low female: male transmission probability, increasing the likelihood of female discordant couples remaining discordant. Males on the other hand may have been infected more recently, during the lifetime of the couple, and will be more likely to transmit the infection to their female partners, than vice versa (because of male circumcision). Further, in most countries, there is a bias in coverage, with higher refusal rates for testing among men in couples than among women in couples, which would result in an artificially high proportion of female discordant couples (if, as is likely, refusal rates were higher in men at higher risk of HIV infection, compared to women).

In another analysis, the covariates age, region of residence, ethnicity, urban location, marital status -- including polygamy and the existence of successive marriages, education, wealth quintiles, religion, male circumcision and female genital mutilation, were analysed for their relationship with HIV in five countries (including Burkina Faso and Ghana), using the DHS data.⁹⁸ In Ghana, as in Cameroon and Tanzania, having been in successive marriages was positively associated with HIV infection in females.

Regardless of the reasons, the data nevertheless imply that the vast majority of HIV-positive cases in couples are in discordant couples, where only one member of the couple is positive. Importantly, HIV testing and knowledge of HIV status remains low in most of West Africa, although the proportion of people having been tested and knowing their status is higher among HIV-infected people (see figures in Table 6) than in the general

population (see figures in Table 5). These data imply that there is significant scope for prevention efforts among infected couples, with a need to promote couple-oriented counselling and testing.

4.5. Epidemiology of HIV and related behaviour in high risk populations

Table 4 also shows HIV prevalence in some of the main high risk populations (FSWs, their clients, MSM, truckers, prisoners, men in uniform, fishermen, miners and IDUs) of the 15 West African countries,^{32, 33, 67, 88, 91, 99-126} compared with ANC and general population prevalence. In 10 of the 13 countries with recent data for **FSWs** (the exceptions being Côte d'Ivoire, Guinea Bissau and Sierra Leone), HIV prevalence in FSWs was at least eight times higher than the female general population (or ANC prevalence figures when no general population data are available). This ratio is over 20 in Mali, Niger and Senegal, and over 12 in Guinea, Benin and Ghana. In Côte d'Ivoire, the FSW data presented correspond to clinic-based data at "Clinique de Confiance" in Abidjan in 2006-07. HIV preventive interventions targeting FSWs have been going on at this site since 1992, when HIV prevalence among FSWs attending the clinic was 89%. It progressively decreased to around 33% in 1998, and then remained stable until 2003, the last year HIV prevalence was estimated in this population prior to the historically low figure of 2006. In Sierra Leone, the only recent prevalence study available on FSWs was carried out in Freetown in 2005 among bar/club-based FSWs recruited through community leaders. Older data, accessed in the 2006 UNAIDS fact sheet, showed a prevalence of 27% among FSWs from Freetown in 1995, and a corresponding figure of 70% for FSWs outside major urban areas in 1997. In Guinea Bissau, the ratio of about four could be distorted by the high prevalence of HIV-2 in the general population and by the non-availability of population-based data.

HIV prevalence data on **clients of FSWs** are available from eight countries. In all of the seven countries where population-based HIV prevalence data are available, apart from Burkina Faso, HIV prevalence among clients is between three and eight times higher than among men of the general population. In Burkina Faso, the population of clients of FSWs was very young and, when standardizing HIV prevalence among clients according to the age distribution of the men recruited in the 2003 general population study, it became 3.3%, a figure 1.7-fold higher than the general population prevalence among men. In some countries, HIV prevalence data are available for non-paying sexual partners of FSWs. In 1998 in Cotonou, Benin, HIV prevalence was 12.2% among male personnel of prostitution venues, whereas it was 16.1% among boyfriends of FSWs. In 2001 in Accra, Ghana, HIV prevalence in the same two groups was 17.5% and 32.1%, respectively. In 2002 in Niamey, Niger, HIV prevalence among non-paying sexual partners of FSWs (mostly boyfriends or male personnel of prostitution venues) was 9.8%. This much higher prevalence among non-paying partners of FSWs, compared to their clients, is likely related to frequency of sexual exposure (with low levels of condom use) to these women where HIV prevalence is much higher still.

Truckers are among the group of men considered at high risk that has been studied most thoroughly in many developing countries, especially after it was shown that they played a major role in the spread of the HIV epidemic in the 1980s and early 1990s in Eastern Africa. In West Africa, HIV prevalence among this group of men has been studied in nine countries. In all of them, apart from Guinea and Burkina Faso (the only available study among truckers in the latter country dates from 1994), HIV prevalence was lower in this population than among clients of FSWs and was generally about twice that of men in the general population. In Nigeria and Togo, HIV prevalence among truckers was similar to the ANC prevalence. Significant proportions of these men may have sex with FSWs: in Côte d'Ivoire for example, 16% of a sample of truckers reported sex with FSWs in the past 12 months,¹²⁷ whereas this proportion reached 80% in a country-wide study carried out in Nigeria in 2005.¹²⁸

Men in uniform had a higher HIV prevalence than clients of FSWs in four of the six countries where it was studied (Burkina Faso, Guinea, Niger and Togo). This suggests that this population is at higher risk and could possibly include men who are non-paying partners of FSWs. In Ghana, 9% of a sample of policemen reported sex with a FSW in the past year in 2002 (this figure is six times higher than that reported by men in the 2003 DHS, Table 3). The prevalence of HIV among men in uniform was moderately high in Nigeria and Senegal. **Fishermen** also had a prevalence of 5% in Guinea, a figure higher than that of clients of FSWs in this country. Twenty-one percent (21%) of fishermen reported sex with FSWs in the last year. The only other country with HIV prevalence data for fishermen is Senegal, where it was estimated at 1.0%, a figure 2.5 times higher than that of the general population of men. Finally, **miners** were found to be at high risk for HIV in Guinea and moderately at risk in Niger, whereas HIV prevalence was lower in this population than the general population of men in Ghana.

In recent years, **MSM** have emerged as a high risk population in West Africa. Indeed, in the three countries where HIV prevalence has been studied in this population (Ghana, Nigeria and Senegal), it varied between 13.5% and 25.3%. These figures show that MSM are many times more at risk of HIV than any other group of men mentioned above, and the behavioural data available also suggest that they are at greater risk of transmitting HIV (high levels of bisexuality, prostitution, multiple partners, and low levels of condom use).

Prisoners constitute another high risk population, when considering the (few) data available on this group of men and women, but there are few recent studies on this population. In Accra, Ghana in 2004, HIV prevalence was 19% among prison inmates; 31% of the sample reported homosexual sex. Finally, there seems to be an emerging problem of **injection drug use** in the region. In a study carried out in Nigeria in 2007, HIV prevalence was 5.6% among IDUs. In a very small study carried out in Cape Verde in 2007, 2/14 IDUs were HIV-positive (14.3%). In Sierra Leone, 8% of a sample of FSWs reported injecting drugs in the previous year.

Table 7: Prevalence of HIV, gonorrhoea and chlamydia, and condom use among female sex workers and their clients in two rounds of integrated behavioural and biological surveys (IBBS) carried out by Projet Sida-3 in 2002-03 and 2005-06 in eight West African countries

Variables	BF		BN		GH			GU		ML		NG		SN		TG	
	IBBS1	IBBS2	IBBS1	IBBS2	IBBS1	IBBS2	Roamers	Seaters	IBBS1	IBBS2	IBBS1	IBBS2	IBBS1	IBBS2	IBBS1	IBBS2	
Female Sex Workers																	
HIV prevalence	20.9	16.0	46.1	30.5	70.0	20.4	45.2	30.5	ND	30.0	32.6	42.0	33.0	27.5	16.4	53.9	45.4
Prevalence of gonorrhoea	6.1	9.2	20.4	3.6	11.0	1.3	2.9	6.9	21.0	15.0	9.2	13.7	11.8	7.1	6.5	15.7	3.4
Prevalence of chlamydia	9.1	6.9	6.0	5.7	2.0	2.0	1.1	6.1	15.0	9.0	10.9	7.7	8.8	4.0	0.8	7.7	3.7
Condom use last sex																	
With client	99.4	100.0	90.0	98.0	NA	NA	99.4	98.2	97.0	97.0	95.6	93.6	94.6	86.6	89.9	92.4	87.7
With regular partner	56.4	46.0	30.0	28.0	NA	NA	31.0	23.7	37.2	24.7	83.5	91.8	83.8	41.0	39.6	33.0	
Clients							ND	ND	ND	ND	ND						
HIV prevalence	1.2	1.6	7.2	4.3	15.8	4.9						6.0	2.2	2.1	2.4	13.3	7.7
Prevalence of gonorrhoea	0.4	ND	2.8	1.1	1.7	1.2						1.3	ND	0.6	ND	1.2	ND
Prevalence of chlamydia	1.6	ND	4.3	2.1	3.9	6.6						1.9	ND	0.6	ND	5.6	ND
Condom use last sex																	
With FSW	95.8	98.4	62.0	94.0	88.0	91.0						55.7	76.5	90.2	97.4	87.0	89.6
With spouse	8.4	62.5	2.0	13.9	NA	NA						26.2	17.3	42.9	16.4	26.8	36.3
With other regular partner	56.5	70.6	18.0	44.0	NA	NA						55.5	74.7	67.8	61.5	53.1	72.8
With casual partner	94.9	93.8	46.0	71.0	NA	NA						63.4	78.4	83.3	54.2	NA	NA

BF: Burkina Faso, BN: Benin, GH: Ghana, ML: Mali, Niger, SN: Senegal, TG: Togo

4.5.1. Time trends in sexual behaviour and prevalence of HIV, gonorrhoea and chlamydia in the presence of targeted interventions

Projet Sida-3, funded by CIDA, carried out interventions targeting FSWs and, in some countries, their clients, in nine West African countries from 2001 to 2006. The interventions involved field outreach activities by trained peer outreach workers – including Behavioural Change Communication (BCC) and condom promotion – coupled with provision of free STI clinical care using syndromic approaches, at dedicated clinics for FSWs. In some cases VCT and HIV care and support components were added to the services offered at the clinics for FSWs. Additional Projet SIDA-1/2/3 activities included a focus on gender and community issues, including empowerment activities and structural interventions. Interventions targeted towards clients also involved field outreach activities with clients on-site at prostitution venues carried out by trained male peer outreach workers; in conjunction with referral to free, confidential STI clinics for men. See section 5.2 for more details.

Most countries implemented interventions for FSWs during the 3rd phase of the project (SIDA-3), from 2001 onwards. However in Ghana and Benin, interventions were implemented earlier and for longer periods of time, from 1996 and 1992 onwards, respectively.

IBBS using comparable methodology was carried out among FSWs and their clients in the intervention sites (usually places with known high levels of sex work, which tended to be large / capital cities) of most of these countries in 2001-02, shortly after the initiation of the project, and in 2005-06, towards its completion. These surveys form a unique dataset enabling analysis of time trends among FSWs and their clients. The only other time trend data for FSWs comes from sentinel surveillance of FSWs in Senegal. Table 7 shows the main survey results concerning HIV and STI prevalence as well as condom use.¹²⁹ No survey was carried out in Côte d'Ivoire because of the civil war (the first round was in preparation when the civil unrest started). In addition, there was no round 1 in Mali; HIV testing was not carried out in round 1 in Guinea; clients were not included in the surveys carried out in Mali and Guinea (they were replaced by truckers); there was no round 2 among clients in Ghana; testing was not carried out for gonorrhoea or chlamydia among clients in round 2, except in Benin. Note also that in Ghana, the data were analysed after stratification for typology of sex work ('seaters' are women who admit practising sex work as a profession and usually practise their trade from their homes, they come from low socio-economic groups; 'roamers' are more diverse group, including school drop-outs and traders, and porters at markets and car parks and stations, who go out in search of their customers on the streets and in bars and hotels). In the other countries, all women were analysed together, and they were mainly self-identified FSWs.

In general, there was a moderate decline in HIV prevalence among FSWs between the two surveys. This difference was statistically significant, after controlling for age, in Benin, Niger, Senegal and Togo; and when considering combined data from all countries. In Ghana, whereas there was a significant decline in HIV prevalence among seaters, there was a significant increase among roamers. This may be partly due to differences in

methodologies between the two surveys (unlike the 2nd round in Ghana and both rounds in other surveys that were field-based studies, the first round among FSWs in Ghana was clinic-based). This may also be due to a combination of decreasing incidence and AIDS mortality among the stable, considerably older, population of seaters, in contrast to roamers, among whom a combination of younger age, higher turnover and lower mortality within the population, would result in a higher incidence rate. It also seems that uptake of interventions (e.g. attendance at meetings on HIV/AIDS, attendance at STI clinics and VCT uptake) is better among seaters than among roamers.

With regards to gonorrhoea and chlamydia, analysis of their combined prevalence yielded a significant decline, after controlling for age, in Benin, Guinea and Togo; and when considering combined data from all countries. There was a slight non-significant increase in Burkina Faso. In Ghana again, whereas there was a significant decrease in gonorrhoea among seaters, there was an increase in both gonorrhoea and chlamydia prevalence among roamers between the two rounds. However, the FSW intervention started during Projet Sida-2 in Ghana and the figures presented in Table 7 do not include estimates from 1996-97 when gonorrhoea prevalence was 33.5% and 23.2% among seaters and roamers, respectively, and chlamydia prevalence was 11.0% and 19.2% among seaters and roamers, respectively. The situation was similar in Benin when the FSW intervention actually started with Projet SIDA-1 in 1993 -- gonorrhoea and chlamydia prevalence were 43% and 9%, respectively, in Cotonou (see also the case study on Benin in section 5 for more details). There was thus a pronounced decline in gonorrhoea and chlamydia prevalence among FSWs over a decade of interventions in both Ghana and Benin.

Condom use with clients was already very high at the first round of data collection and did not increase significantly between the two rounds. This may be due to the fact that the first round was implemented a few months (several years for countries where the FSW intervention started during Projet SIDA-1 [Benin] or Projet SIDA-2 [Ghana]) after the beginning of the intervention in most countries, and rapid increases in condom use had occurred before the measurement of this indicator. Condom use with regular partners was however much lower in general, with the exception of Mali and Niger, and was not much influenced by the intervention.

Among clients, condom use rates with FSWs were generally lower in the first round than those reported by the FSWs themselves, suggesting the likelihood of social desirability bias among the women. There were however exceptions, including Senegal, Togo and Burkina Faso, where similar condom use rates were reported by FSWs and their clients. In Benin and Niger, there was a significant increase in condom use with FSWs reported by clients between the two rounds. Condom use with casual partners was also relatively high and increased significantly in Benin and Niger. The reasons why this indicator decreased significantly between the two rounds in Senegal is unclear. Condom use with non-spousal regular partners also increased significantly in Benin, Niger and Togo; although rates were lower than with FSWs and casual partners. Condom use was lower with spouses than with other types of non-commercial partners. Rates however increased in Burkina Faso, Togo and Benin, but decreased in Niger and Senegal.

HIV prevalence among clients decreased between the two rounds in three of the five countries for which data are available for two time points (Benin, Niger and Togo). It increased slightly but not significantly in Burkina Faso and Senegal. Although none of these variations was significant at the country level, when considering all data from Projet SIDA-3 (i.e. for the five countries combined), there was a statistically significant decline, from 4.7 to 3.1%, between the two rounds. In Benin, the only country with data on gonorrhoea and chlamydia in the two rounds, there was a decline in the prevalence of these two bacterial STIs (see the case study on Benin in section 5 for more details).

All in all these data suggest that HIV preventive interventions may have an impact on sexual behaviour and HIV/STI prevalence among FSWs and their clients, although the impact of the intervention varied somewhat between countries, with clearer successes in Benin, Niger, Senegal and Togo and when the interventions were sustained over a long period. This is the case in Benin and Ghana, where the impact since the mid-1990s is much clearer than when restricting the assessment to the period covered by Projet Sida-3 only (see section 5 for more details). The limited availability of data for Mali and Guinea makes impact assessment difficult for these countries, but there was a clear decrease in gonorrhoea and chlamydia among FSWs in the latter country. Finally, long term time trend data from Côte d'Ivoire also show that the FSW intervention carried out in Abidjan since 1992, and recently expanded to other cities, had a major impact (see above).

5. Case study: The importance of sex workers and their clients in the HIV epidemic, and impact of interventions targeted to these populations in Benin

5.1. Analysis of the transmission dynamics of HIV in Cotonou

5.1.1. HIV epidemiology and related sexual behaviour, general population, core and bridging groups in Cotonou – the situation 10 years ago

Sexual behaviour and HIV/STI prevalence data are available for Cotonou from the end of the 1990s, from serial cross-sectional studies of FSWs and their clients, sentinel surveillance data and a population-based survey.^{18, 19, 32, 37, 40, 88, 130-132}

Data from the general population survey carried out in 1998 in Cotonou (the Four Cities Study) indicate that much higher proportions of men than women had multiple sex partners (12% of married and 20% of unmarried men; vs. 0.8% of married and 5% of unmarried women in the last year).⁴³

Data from the 1998 study of clients of FSWs, recruited at sex work venues, indicate that the vast majority were married or had regular girlfriends (27% and 52% respectively). One third of the clients interviewed had other casual sex partners who were not FSWs,

and there was significant turnover and concurrency of sexual partners in this population.³⁷

Condom use rates reported by clients at last sex with a FSW in 1998 were 56%. Thirteen percent (13%) reported consistent condom use with regular partners and 29% with casual partners. HIV prevalence among the clients was 9.1% when including borderline Western Blot results suggestive of primary HIV infection.^{16, 37, 133} This prevalence was 2.8-fold higher than in the general population of men at 3.3% in 1998.⁴²

HIV and at least some STI prevalence rates are very much higher in FSWs than in the general population, and are intermediate in clients and regular partners of sex workers (Table 8). Taken together, the data suggest that FSWs and their male clients, acting as core and bridging populations, have an important role in HIV/STI transmission in Cotonou. The magnitude of the impact (number of cases prevented, reduction in incidence / prevalence) of HIV preventive interventions targeted towards FSWs and their clients necessarily depends on the number / proportion of HIV infections among men and their ‘low-risk’ sexual partners which are related to sex between FSWs and their clients.

Table 8: HIV prevalence in Cotonou, Benin, selected populations: 1998-9

Population	HIV prevalence	Year	Source
Men general population	3.3%	1998	Four Cities Study
Women general population	3.4%	1998	Four Cities Study
Pregnant women	2.5%	1999	Sentinel surveillance
Female sex workers (FSWs)	40.7%	1998-9	Projet SIDA-2
Clients of FSWs	9.1%	1998	Projet SIDA-2
Boyfriends of FSWs	16.1%	1998	Projet SIDA-2

5.1.2. Estimating the size of bridging groups in Cotonou: the ‘indirect method’

Accurate assessment of the proportion of the male population that pays for sex is extremely difficult, since representative population-based household surveys are subject to strong social desirability bias, and tend to produce gross underestimates. The recent DHS surveys carried out in West Africa are a case in point (see Table 3 and section 6).

With relevant data from FSWs, clients and the general population, the so-called ‘indirect method’ can be used to obtain more accurate estimates of the size of the client population, using data on the size of the FSW population, number of sex acts with clients reported by FSWs, and frequency of client visits to FSWs (Table 9). The number of FSWs in Cotonou (1,915) is multiplied by the average number of client contacts per year per FSW (782) = 1,497,530. This is the total number of FSW-client sex acts in a year in Cotonou. This number is divided by the average yearly number of visits to FSWs per client: 32.

1,497,530 / 32 = 46,798 different men who have sex with FSWs per year in Cotonou

Divide this by total male population Cotonou 15-49: $(46,798 / 155,307) \times 100$, to obtain proportion of adult males who had sex with a FSW in the preceding year = 30.1%.

Using this method, it was estimated that 30% of the adult male population in Cotonou had sex with a sex worker in the year preceding the survey (1997-8) (in contrast to 1.7% in the Benin DHS in 2006).^{11, 133, 134} Given this proportion, and given that HIV prevalence among clients was 9.1% while it was 3.3% in the Four Cities general population survey, HIV prevalence among men who were *not* clients of FSWs was estimated at 0.8%. The estimated relative risk for sex with a FSW and prevalent HIV among men in Cotonou is thus 11.4, giving an HIV etiological fraction of 91% for sex with a FSW among *clients*, and an overall HIV population attributable fraction (PAF) of 76% for exposure to FSWs in men in general in Cotonou (Table 9). In other words, an estimated 91% of prevalent HIV infections among clients, and 76% of prevalent HIV infections among men in general in Cotonou, were attributable to sex with FSWs.

Table 9: Estimating the size of bridging groups in Cotonou: the ‘indirect method’

	Indicator	Value	Data source or derivation	Emp/Der*
A	Estimated number of FSWs in Cotonou (1997)	1915	Mapping	Emp
B	FSWs: average no. of client contacts per year (1997)	782	Survey FSW	Emp
C	Clients: average no. of visits to FSWs / year (1998)	32	Survey clients	Emp
D	Number of clients of FSWs in Cotonou	46,798	$(A * B) / C$	Der
E	Total male 15-49 population Cotonou	155,307	Census	Emp
F	No. of non-clients in Cotonou male general population	108,509	$E - D$	Der
G	% adult male population who are clients of FSWs	30.1%	$(D / E) * 100$	Der
H	HIV prevalence clients (1998)	9.1%	Survey clients	Emp
I	HIV prevalence general population (including clients) (1997-8)	3.3%	Survey general population	Emp
J	No. prevalent HIV infections in Cotonou 1997-8	5,125	$(E / 100) * I$	Der
K	No. prevalent HIV infections clients Cotonou 1997-8	4,258	$(D / 100) * H$	Der
L	No. HIV infections non-clients general population Cotonou 1997-8	867	$J - K$	Der
M	HIV prevalence non-clients general population	0.8%	$(L / F) * 100$	Der
N	Relative risk sex with FSW and prevalent HIV in men	11.4	H / M	Der
O	HIV etiological fraction for sex with a FSW among clients	91.2%	$1 - N / N$	Der
P	Proportion HIV infections clients : total in general population	0.83	K / J	Der
Q	PAF of exposure to FSWs for prevalent HIV in men in general population	76%	$P * O$	Der

PAF = population attributable fraction

Emp / Der = empirical or derived

Calculating D:

- number of FSWs in Cotonou (1,915) x average number of client contacts per year (782) = 1,497,530: total number of FSW-client sex acts in a year in Cotonou
- Divide by the average yearly number of visits to FSWs per client: 32
- $1,497,530 / 32 = 46,798$

Similar results were obtained from Accra, Ghana, using data from a study on clients of FSWs in 2001. In this setting, the differential between HIV prevalence in clients and the general population was lower (5.9% vs. 3.3%), but the estimated proportion of adult men who are clients of FSWs was higher (52%). The PAF for prevalent male HIV infections related to sexual exposure to FSWs was 84% for Accra. When a sensitivity analysis taking into account the level of uncertainty of the parameters used for the PAF estimation was carried out with the Ghana data, a range of 47-100% around the 'point estimate' of 84% was obtained for the PAF.¹⁰³

The data from Cotonou, and from Accra, thus strongly suggest that transactional sex was the driving force of the epidemic, accounting for the majority of HIV cases among adult men in these cities.

A population-based survey was carried out on a random sample of men and women in Cotonou in early 2008. Preliminary data from this survey are presented here, from about 80% of the total sample: 911 men and 1,050 women (unpublished data). In the face-to-face interview, 12% of men reported having paid for sex in the last year, and 16% reported sex with a FSW in their lifetime; 2.4% of women reported ever having exchanged sex for money. In the polling booth survey (a group survey method which is totally anonymous and has been shown in other contexts to elicit reporting higher levels of risky behaviour than one-to-one face-to-face interviews), about 24% of married men reported seeing a FSW in the last year and 42% in their lifetime; for unmarried men these figures were 16% and 25% respectively.

These data provide support for the validity of the indirect method used to calculate the proportion of men who have sex with FSWs. The 30% obtained using the indirect method is fairly close to the polling booth survey results of 24% of married and 16% of unmarried men. These figures are very much higher than the DHS 2006 survey data, which gave only 1.7%. Even the face-to-face interviews in the current survey give a figure 10 times higher than the DHS results. These data thus provide further support for the assertion that the DHS surveys severely underestimate the proportion of men who are clients.

5.1.3. Exposure of non-FSW ('low risk') women in the general population to HIV through contact with male clients of FSWs

Once infected with HIV, clients of FSWs act as a bridging population, transmitting HIV to their other (non-FSW) partners. Recall that 80% of clients had regular partners (wives or girlfriends), and 35% casual partners. Using data on the proportion of HIV-positive clients – and the proportion with STI pathogens as detected by Polymerase Chain Reaction (PCR) (*C. trachomatis*, *N. gonorrhoeae*, *T. vaginalis*), genital ulcers on clinical examination, or a history of ulcer or urethral discharge during the three months before interview – in combination with sexual behaviour and condom use rates with FSWs and non-FSW partners, we calculated the number of non-FSW women in Cotonou who would be exposed to HIV infection or HIV/STI co-infection through unprotected sex with clients of FSWs.

If 46,798 men had contact with a FSW in one year, then 3,743 non-FSW women in Cotonou would have been exposed to HIV infection through unprotected sex with clients in the last year, and 1,076 simultaneously exposed to STI and HIV (the probability of transmission would be enhanced by the presence of an STI). Assuming a population size of 160,000 adult women in Cotonou, then 2.3% of them would have been exposed to HIV, and 0.7% simultaneously to STI and HIV, in the last year, through unprotected sex with clients of FSWs.

These figures provide an illustration of the extent to which known STI/HIV prevalence levels in FSWs and their clients – in combination with known sexual behaviour patterns of clients with FSW and non-FSW partners – could account for STI and HIV propagation within the general population in Cotonou. Given an HIV prevalence of 3.4% in 1998 in the general population of women in Cotonou, it is unlikely that incidence was more than 0.5% per year, which, given a population size of 155,000, would result in a maximum of 800 new infections per year among women in Cotonou. Our calculations thus suggest that HIV transmission from FSWs through male clients to their non-FSW partners could account for the vast majority of these new infections.

5.1.4. The role of FSWs and their clients in the transmission dynamics of HIV in Cotonou

The HIV epidemic in Cotonou has been characterised by a high initial concentration of HIV infections in FSWs (who are infected both by their paying clients and their regular partners), and a slow outwards diffusion to their circumcised male clients, with cases of HIV transmission probably being highly linked to concurrent STI infections. After sufficient numbers of men are infected, outwards transmission of HIV to their regular and casual female partners starts to occur. Given STI/HIV prevalence in, and condom use rates by, clients with non-FSW female partners, relatively large numbers of women in the general population would be simultaneously exposed to HIV and STI through unprotected sex with male clients. However non-FSW women would transmit the infection to other men in the general population at a very much lower rate, partly because they generally have low-risk behaviour (relatively high age at first sex and low proportions with multiple sex partners), and partly because of nearly universal male circumcision rates which would reduce the transmission probability from women to men significantly, particularly in a context of low STI prevalence as is found in the general population of Cotonou (in contrast to FSWs). Non-FSW HIV-positive women may thus frequently be an epidemiological ‘dead end’, from whom ongoing transmission is unlikely to occur (apart of course from vertical transmission).

Under this scenario, a concentrated HIV epidemic will occur, which progresses moderately fast and peaks at much lower levels than epidemics in countries with lower levels of male circumcision and higher levels of risky sexual behaviour in women in the general population. In Cotonou, with universal male circumcision and relatively low levels of sexual risk behaviour among women in the general population, the conditions for generalisation of the epidemic do not appear to exist, and the epidemic has remained concentrated. Nevertheless, HIV can still reach significant levels in the general

population due to very high prevalence among FSWs, and thus multiple seeding of HIV among the general population.

This is in contrast to some other countries in Southern and Eastern Africa, where more explosive increases in general population prevalence and numbers of AIDS cases/deaths have occurred, and where epidemics tend to be generalised.

In situations such as these, where there is a significant differential between HIV prevalence in sex workers, their clients, and the general population, interventions targeted at FSWs and their clients could substantially delay the onset and reduce the magnitude of a widespread epidemic in the general population.

5.2. The impact of interventions targeted towards FSWs and their clients in Benin

In Cotonou, interventions targeting FSWs were initiated in 1988, involving field outreach activities - including BCC and condom promotion – coupled with provision of free STI clinical care using syndromic approaches, at a dedicated clinic for FSWs in the centre of the city, the STI dispensary (Dispensaire IST [DIST]). These activities were expanded in 1992 under the CIDA-funded Projets SIDA-1/2/3, and attendance at the DIST increased from about 20 to 200 visits per month. Additional Projets SIDA-1/2/3 activities included a focus on gender and community issues, including empowerment activities and structural interventions (work with the police to decrease harassment, work with prostitution sites owners and managers to improve lodging conditions, etc.).

The intervention with clients, initiated in Cotonou in 1999, followed the same successful model as for the FSWs: field outreach activities with clients on-site at sex work venues carried out by trained male peer outreach workers; in conjunction with referral to free, confidential STI clinics for men.

From 2000 onwards, there was geographical extension of the interventions to five other urban areas of Benin – Porto Novo, Abomey-Bohicon, Parakou, Kandi and Malanville. VCT and HIV care and support components were added to the services offered at the clinics for FSWs.

In 2005, a total of 4,207 different FSWs attended the project-supported clinics. This represents 77% of the 5,481 FSWs enumerated in the cities covered by the intervention. There were 8,725 visits by these women at the clinics, representing an average of more than two per woman during the year. In addition, the same year, there were over 33,000 contacts in the field with FSWs and over 120,000 contacts with clients and other sexual partners of FSWs.¹³⁵

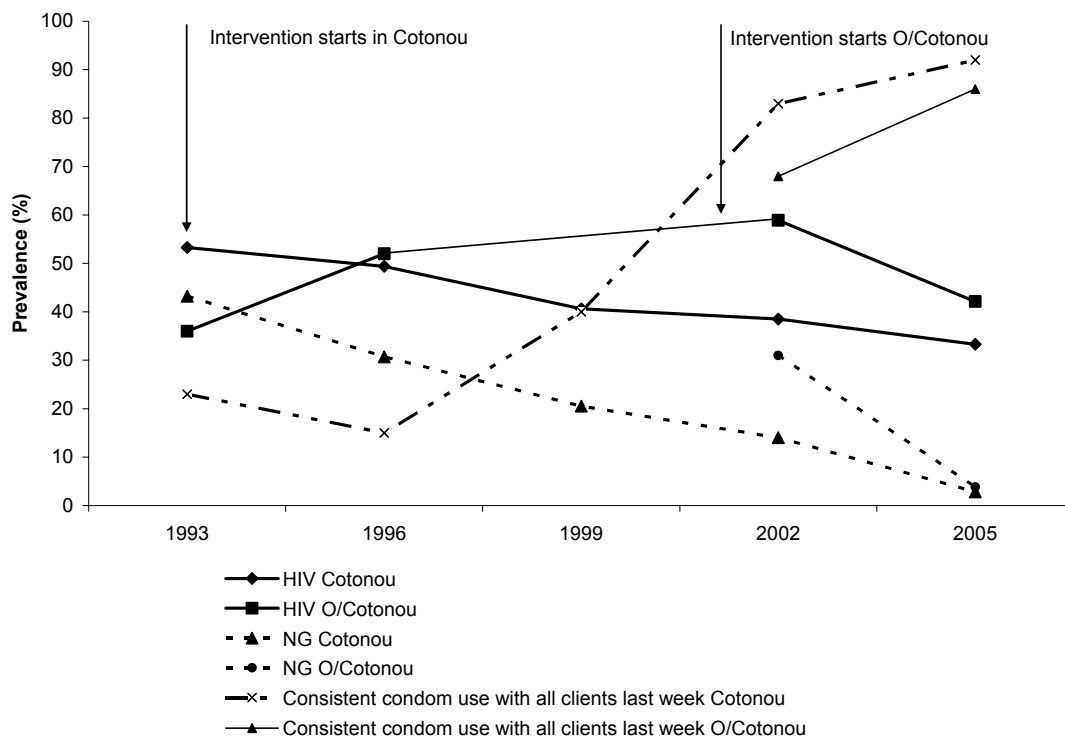
IBBS were carried out by Projets SIDA-1, SIDA-2 and SIDA-3 among FSWs in Cotonou in 1993, 1996, 1999, 2002 and 2005; among clients of FSWs in Cotonou in 1998, 2002 and 2005; and among FSWs and clients in the towns outside Cotonou covered by the intervention (Porto Novo, Abomey, Bohicon, Parakou) in 2002 and 2005.

5.2.1. FSWs: trends in HIV and other STIs and condom use

Figure 12 shows trends in gonorrhoea and HIV prevalence, and condom use with clients, among FSWs in Cotonou and outside Cotonou (O/Cotonou).¹³⁶ The 2002 and 2005 HIV prevalence points for O/Cotonou are from Projet SIDA-3; earlier points are from surveys from the National AIDS Control Programs (NACP) (no data available for O/Cotonou in 1999). HIV increased O/Cotonou from 1993 to 2002, then decreased significantly in Cotonou and also decreased O/Cotonou after the implementation of interventions in the early 2000s. The decline in gonorrhoea prevalence was particularly dramatic (from 43% in 1993 to 3% in 2005 for Cotonou, and from 31% in 2002 to 3% in 2005 O/Cotonou). Chlamydia and syphilis prevalence also decreased significantly in Cotonou, from 9% in 1993 to 3% in 2005, and from 9% in 1993 to 1% in 1999, respectively.

There was also a dramatic increase in reported consistent condom use rates with clients over time in Cotonou, from 23% in 1993 to 92% in 2005; and O/Cotonou, from 68% in 2002 to 86% in 2005 (Figure 12).

Figure 12: HIV and gonorrhoea (NG) prevalence and consistent condom use with clients among FSWs in Benin, 1993-2005. O/Cotonou: outside Cotonou



HIV incidence was measured among FSWs in the context of two microbicide clinical trials that showed no effectiveness in preventing HIV transmission. In the first study, carried out from 1998 to 2000, HIV incidence was 9.6 per 100 person-years.¹³⁷ In the

most recent study carried out from 2005 to 2007, HIV incidence was lower at 5.9 per 100 person years.¹³⁸

5.2.2. Clients of FSWs: trends in HIV and other STIs and condom use

Figure 13 shows trends in condom use rates over time; Figure 14 shows trends in HIV and gonorrhoea prevalence.¹³⁰

There has been a significant increase over time in condom use with casual and commercial partners, in both Cotonou and O/Cotonou, whereas no change was observed in condom use with regular partners. The decrease in HIV prevalence is moderate and not statistically significant; the decline in gonorrhoea prevalence is highly significant in both Cotonou and O/Cotonou.

Figure 13: Time trends in sexual behaviour among male clients of female sex workers: Benin, 1998-2005. O/Cotonou: outside Cotonou.

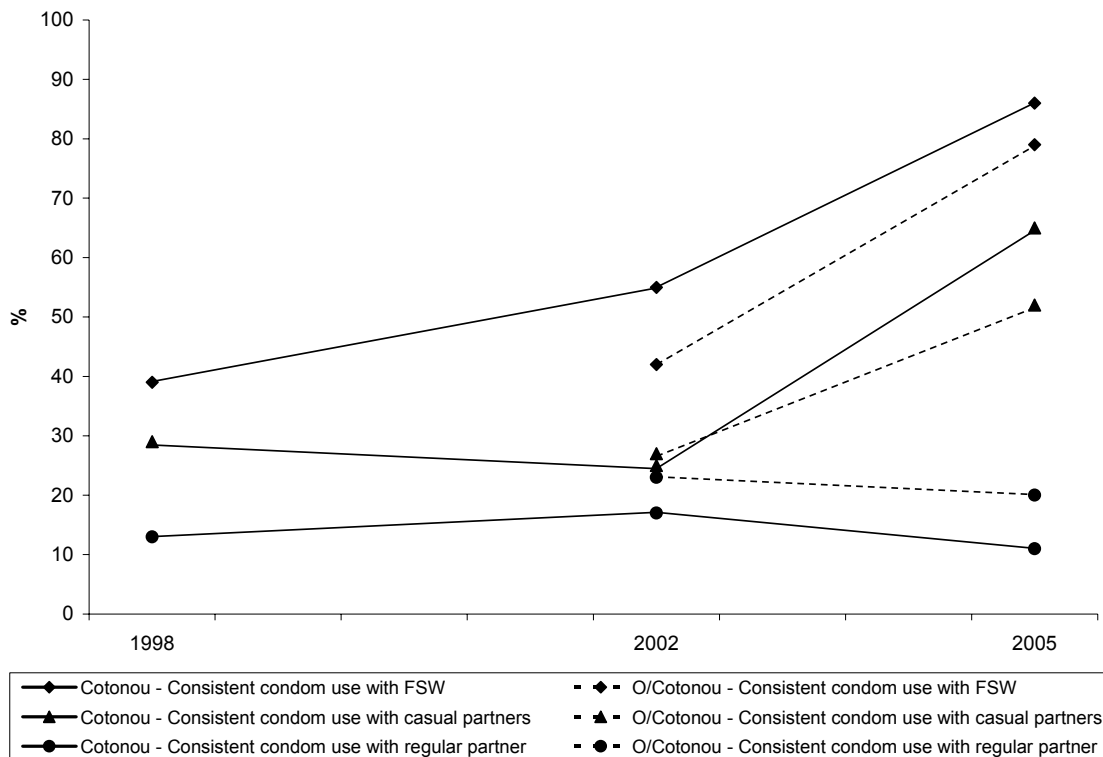
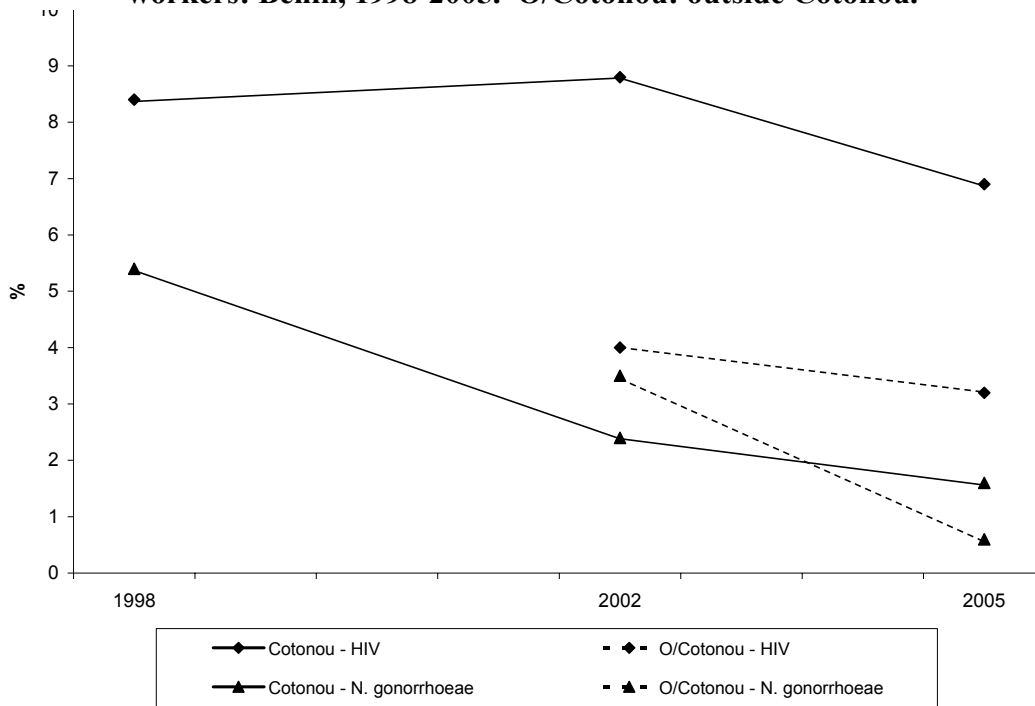


Figure 14: Time trends in HIV/STI prevalence among male clients of female sex workers: Benin, 1998-2005. O/Cotonou: outside Cotonou.



5.2.3. Interpretation

The data shown above indicate that, over the period of implementation of interventions targeted towards FSWs and their clients in Cotonou and other main cities in Benin, significant changes in sexual behaviour and STI/HIV prevalence levels occurred in these two populations. Condom use increased quite dramatically, STI prevalence decreased in both groups, while HIV has stabilised in clients and decreased in FSWs. The data suggest that the interventions targeted towards FSWs and their clients have been at least partially responsible for these positive changes.

The later time of implementation of the project outside Cotonou allows the examination of the data as if resulting from a natural experiment. While condom use and gonorrhoea rates in FSWs and clients (and HIV prevalence levels in FSWs), were similar in Cotonou to those outside Cotonou around the time of implementation of the interventions (1993 / 1998 and 2002 respectively), by 2005, condom use rates had increased and HIV/STI rates had decreased to very similar levels in both sites.

The data thus strongly suggest that the intervention had a dramatic impact, especially on condom use and gonorrhoea prevalence. Furthermore, scaling-up the intervention to the majority of the FSWs in Benin seems to have accelerated the decline, likely by avoiding re-seeding of the infection from one city to another by this highly mobile population and their equally mobile clients.

The reported increases in condom use rates by clients with casual non-FSW partners also suggest that behavioural change has occurred among the clients themselves, and not solely among the FSW population and in the context of commercial sex (Table 7 shows increased condom use with all types of partners of FSW clients in Benin). Focusing on ‘both sides of the equation’ is likely to be a more effective way of achieving behavioural change than focusing only on FSWs, particularly given the prevailing nature of gender power relations, as well as the high mobility and turnover rates characteristic of FSW populations in many settings in West Africa.

Finally, data from Accra / Kumasi in Ghana and Abidjan in Côte d’Ivoire, where similar relatively long-term interventions have been implemented among FSWs, also demonstrate increases in condom use rates and decreases in HIV/STI rates (see section 4.5 for more details).

5.3. Impact of core group interventions on HIV prevalence levels in the general population

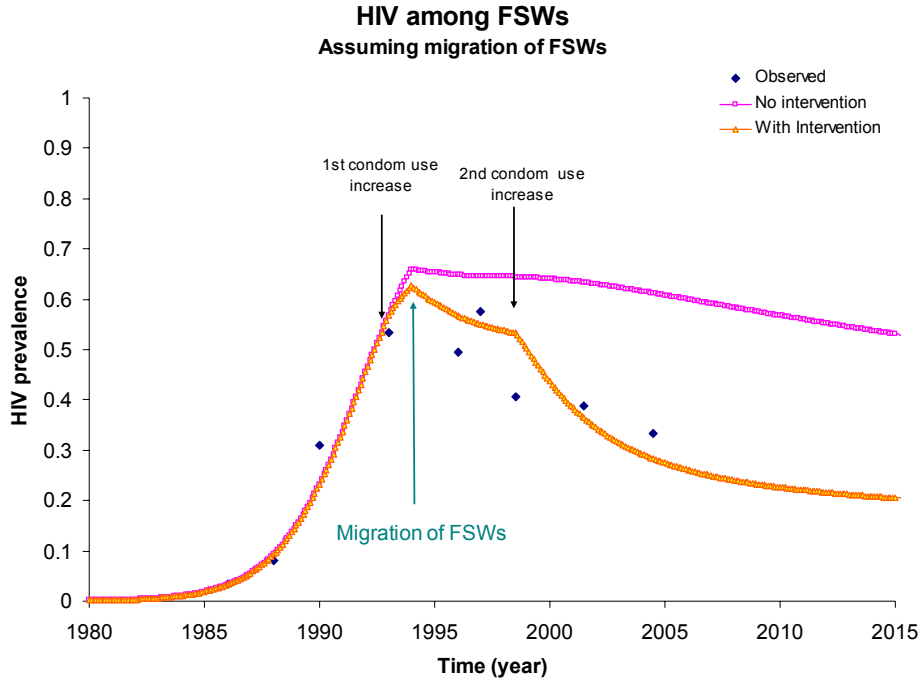
Mathematical modelling studies have been carried out using the epidemiological data shown above, in conjunction with data on the coverage and intensity of the intervention from the Projets SIDA process indicator records.¹³⁹ We have updated these analyses for the purpose of this report. They suggest that, given the epidemiological context in Cotonou, the increases in condom use rates and decreased gonorrhoea prevalence seen among female sex workers (and their clients) which have occurred as a result of targeted interventions, have not only resulted in decreased HIV incidence and prevalence in the sex workers themselves (Figure 15A), but have also resulted in decreased HIV prevalence and incidence among the general population of women (Figure 15B). The Projets SIDA intervention introduced in 1993 may have helped to limit the general HIV epidemic to a prevalence level of about 3%, compared with a possible maximum of nearly 5% without the intervention (Figure 15). The modelling suggests that two years after the intervention was started, 25% of new infections among FSWs and 17% of new infections among women in the general population would have been prevented; after five years, 26% and 22%; after 10 years, 51% and 40%; and after 15 years – to 2008 – 63% and 51%, respectively, of new infections (Figure 15C). The increase in the PAF over time demonstrates that the cumulative effect of the intervention becomes larger and larger over time, since preventing infections in the core group also prevents onwards secondary and tertiary transmission and thus amplification.

In conclusion, these data argue strongly for the importance of core and bridging groups in the HIV epidemic in Benin, and for the effectiveness of targeted interventions in reducing the spread of HIV among FSWs and through their clients into the general population. They also demonstrate the paramount importance on the future course of the epidemic of continuing to implement such interventions, and argue for sustained interventions of this kind over a significant period of time to prevent resurgence of HIV transmission and continue to limit the spread of the epidemic.

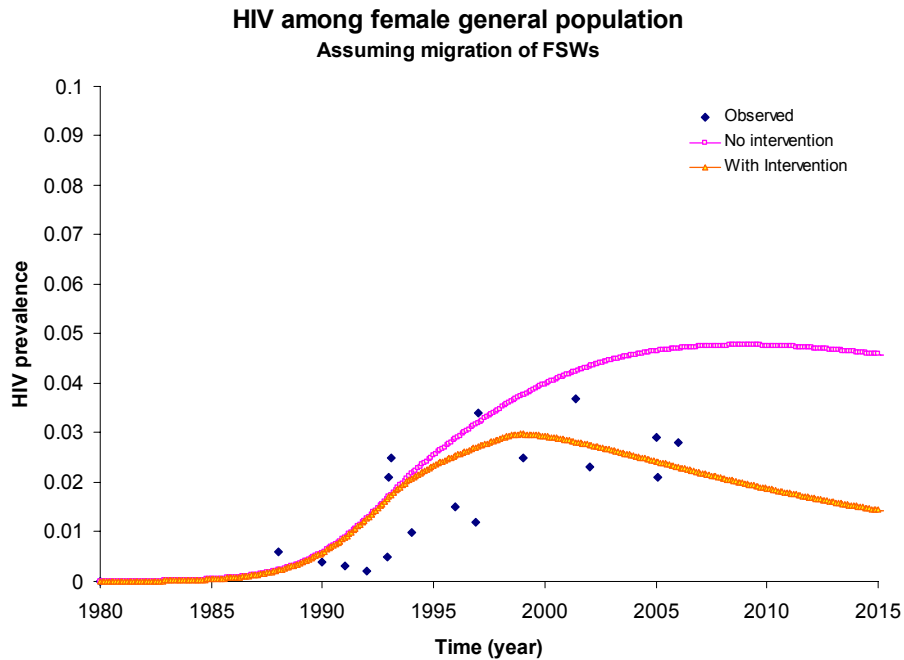
Figure 15: Mathematical modelling of HIV prevalence in Cotonou in presence of the interventions of Projets SIDA-1, SIDA-2, and SIDA-3.

The solid lines correspond to modelling results; dots are observed prevalence.

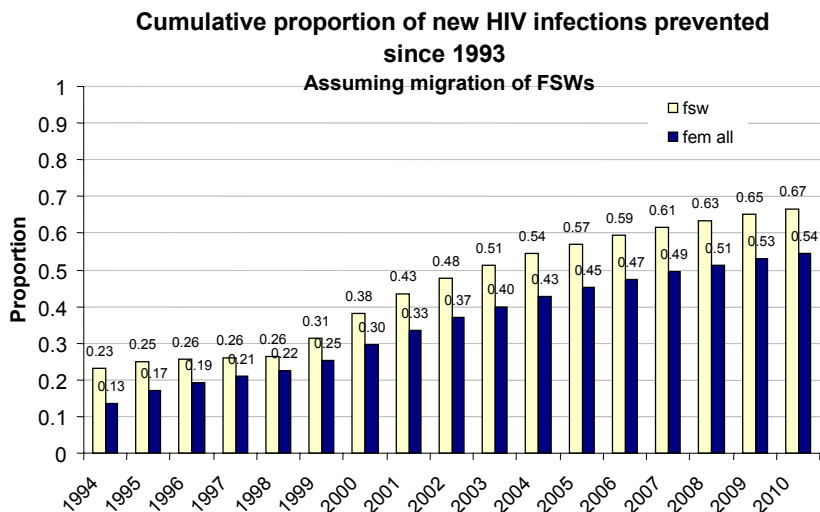
Panel A: HIV prevalence among FSWs.



Panel B: HIV prevalence in the general population of women.



Panel C: Prevented fraction of HIV cases over time among FSWs and women of the general population.



A population-based DHS survey was carried out among men and women in Benin in 2006. In Cotonou, HIV prevalence was 2.8% in women and 0.5% in men.¹¹ In the Four Cities study carried out in Cotonou in 1997-8, using comparable methodology, HIV prevalence was equal at 3.3% in men and 3.4% in women.⁴² The extremely high female: male prevalence ratio (5.6:1) observed in the DHS 2006 survey may be due in part to the low male participation rate in the study in Cotonou (68%), possibly leading to a larger proportion of men at higher risk not being tested, compared to those at lower risk. However it also likely indicates that the epidemic has matured since 1997-8, as discussed in sections 4.4.2 and 6. What we may be seeing is an advanced concentrated epidemic, where transmission outwards from FSWs to male clients has slowed due to intervention and behavioural change. Men, infected earlier in the epidemic than women due to its concentrated nature, have died, and the rate of new infections is not sufficient to sustain initial prevalence, which has now decreased due to mortality. Prevalence in women, reflecting slower outwards transmission from male clients and therefore infection later than men, has as yet decreased only slightly, from 3.4% to 2.8%. If transmission outwards from FSWs continues to slow, we would expect female general population prevalence to decline further over the coming decade, as has male prevalence. However this decline may occur more slowly than it has done to date among men, due to the availability of anti-retroviral therapy (ART) and consequent increased survival.

Finally, it is worth noting that in the 2005 compared to the 2001 behavioural surveillance survey carried out in Benin among youth, available data suggest that in addition to adoption of safer sex practices in the commercial sex milieu in Benin, rates of men paying for sex may have decreased. In 2001, 14.2% of sexually active male students reported paying for sex in the last year, whereas in 2005 this figure was 7.0%. In both surveys, about one-third of the sample was sexually active.¹⁴⁰

Box 2: Summary of case study

The importance of sex workers and their clients in the epidemic, and the impact of interventions targeted towards these populations, on the HIV epidemic

- Sex workers comprise about 1% of the adult female population in Cotonou.
- High proportions (up to 30%) of adult men have sex with these sex workers, and HIV prevalence in these men is 2-3-fold higher than in the general male population (9% vs. 3%).
- An estimated 76% of prevalent HIV infections among adult men in Cotonou are directly due to sex with FSWs. Given high male circumcision rates, concurrent STIs are likely to have played a major role in outwards transmission.
- The vast majority of HIV infections in non-sex worker women in Cotonou are derived from sex with clients of sex workers.
- Clients and regular partners of sex workers also transmit HIV *within* the female sex worker population, again with concurrent STIs playing a major role in addition to sub-optimal condom use rates; HIV prevalence reached extremely high levels in this population (peaking at 53%), 10-20 fold that in the general population.
- Low levels of sexual risk behaviour and of STIs among women in the general population, coupled with nearly universal male circumcision, account for very limited transmission of HIV *within* the general population, producing a concentrated epidemic with very high differentials in HIV prevalence between sex workers and the general population, limited penetration of the epidemic, and thus maintenance of relatively low prevalence in the general population.
- Interventions targeted at female sex workers and their clients have had significant effects on levels of sexual risk behaviour and STI/HIV prevalence in these populations – condom use has increased dramatically, STI prevalence has decreased in both groups, while HIV has stabilised in clients and decreased in FSWs over the period of implementation of the intervention.
- Mathematical modelling studies suggest that, given the epidemiological context in Cotonou and the coverage and intensity of the FSW intervention, the observed increases in condom use rates and decreased gonorrhoea prevalence among FSWs (and their clients) have not only decreased HIV prevalence and incidence in the sex workers themselves, but also decreased HIV prevalence and incidence among the *general population*.
- According to the modelling, the Projet SIDA intervention introduced in 1993 may have helped to limit the HIV epidemic to a prevalence level of less than half what it would have been (~2% vs. 5%) in the general female population without the intervention. It may have prevented 63% of new infections among FSWs, and 51% of new infections among women in the general population, in the 15 years since the introduction of the intervention.
- Actual data from studies among FSWs and the general population bear out the estimates and the modelling results.
- Taken together, these data, in conjunction with the modelling results, demonstrate the importance of core and bridging groups in the HIV epidemic in Benin, and the effectiveness of interventions targeted towards FSWs in reducing the spread of HIV among FSWs and through their clients into the general population. They also demonstrate the paramount importance for the future course of the epidemic, of sustaining such interventions over time.

6. Interpretation of the data

The main aim of this analysis is to better characterise the HIV epidemics in West Africa, and in particular to better understand the contribution of high risk populations to the transmission dynamics of the epidemics in this region, and the extent to which the epidemics are generalised. Understanding the role of high risk populations in the epidemics is necessary in order to be able to design appropriate interventions, since the number and proportion of new HIV infections that can be prevented through interventions targeted towards high risk populations depends on the number and proportion of infections generated by them.

The HIV epidemic in West Africa has so far been considered to be generalised in most countries, with the clear exception of Cape Verde and the possible exceptions of Senegal and Niger. These countries have general population prevalence below 1%, the numerical proxy often used as a threshold for considering epidemics as generalised. However, prevalence alone is insufficient to characterise an epidemic, since significant numbers of infections can be generated through continuous first-wave transmission outwards from high risk populations -- even to the extent of leading to general population prevalence above 1%. Generalised HIV epidemic spread occurs only when transmission in the general population is sustained independently of transmission outwards from core groups.

In most countries of East and Southern Africa, where general population prevalence has reached levels very much higher than 1%, it is clear that the epidemics are generalised. Outwards transmission from high risk populations may still contribute significant numbers of new infections. However, with high HIV prevalence levels also in the general population, in combination with relatively high levels of HIV-related sexual risk behaviour, it seems clear that maintenance of the epidemic is independent of transmission outwards from core groups.

The available data, as presented in the preceding sections of this report, lead us to conclude that simple definitions and numerical thresholds are of limited utility for characterising the epidemics in West Africa. Prevalence in the general population of most of these countries are close to the 1% 'cut-off' for concentrated / generalised epidemics, and prevalence in both FSWs and MSM (where available) are nearly always over ten-fold higher (and in some cases much higher even than that) than in the general population. Given these very high prevalence differentials, plus very high rates of partner change and sub-optimal condom use rates in the high risk populations, these groups certainly contribute a disproportionate proportion of HIV infections. However, with significant general population prevalence varying between 0.7% and 4.7%, and ANC prevalence often higher than this, clearly there is also potential for transmission within the general population. It is in fact impossible to prove this either way with currently available data – that is, to ascertain whether or not the West African epidemics are sustainable *independently* of outwards first wave transmission from high risk

populations. In reality the epidemics appear neither to be fully concentrated nor fully generalised, but to have elements of both ('mixed epidemics').

This discussion may seem somewhat academic. However, its importance lies in the fact that, as discussed above, most epidemics in West Africa tend to be characterised as generalised. This has had a significant effect on HIV/AIDS programming in the region, leading countries to focus primarily on the general population.

What seems most important in this context therefore is to try to assess the *extent* to which core groups contribute to the spread of HIV, and the proportion of infections attributable to specific high risk populations – and thus what proportion of infections could be prevented by reducing transmission among core and bridging groups.

The available data indicating very high HIV prevalence in FSWs, as well as the very high differential between prevalence in FSWs and the general population, suggest that significant proportions of infections in the general population are due to sex with FSWs. In order to estimate this proportion, it is necessary to have information on HIV prevalence rates in the general population, in clients of FSWs and in FSWs themselves; and also on the size of the FSW population and the proportion of the male population that buys sex.

In the most recent DHS+ and other similar population-based surveys, the proportion of men reporting sex with a FSW in the last year is very low, varying between 1.2% in Guinea and 2.9% in Nigeria. There are a number of reasons why these are likely to be serious underestimates:

- (1) Firstly, household-based surveys of the DHS type suffer from social desirability bias because of the stigma attached to sexual contacts with FSWs,³⁶ which may vary over time and in particular may reflect the intensity of HIV prevention programs. They also under-represent mobile men who may be away from home at the time of the survey, as well as excluding places where single men with high risk behaviours might live, such as military barracks or workers' hostels.

Previous surveys of this type carried out in West Africa have actually given considerably higher rates of men reporting sex with FSWs than the most recent surveys. For example, in the 1996 Benin DHS, 19% of men reported sex with a FSW in the last year;¹⁴¹ compared to 0.5% in 2001¹⁴² and 1.7% in 2006.¹¹ In the 1999 Burkina Faso DHS,¹⁴³ this figure was 8%; in Ouagadougou in 2002, it was 12%.³⁶ This dramatic decline is likely to be due at least in part to a change in propensity to report this behaviour. Indeed men may report FSW partners as falling into another category, such as casual partners. In the recent DHS surveys, quite high proportions of men report sex with more than one partner (10%-36%) and extra-marital sex (2%-27%). Much lower rates of these behaviours are reported by women (1%-9% and 0.1%-5%, respectively), while very much higher rates of condom use in extra-marital sex are reported by men than women (from about two to nearly 10-fold) (section 4.4.4). While there may be under-reporting among women, the data suggest that at

least some of these men may in fact be having sex with FSWs, where condom use rates tend to be relatively high (see also section 4.4.4 for other indications of the same social desirability bias from the population-based surveys themselves).

- (2) In surveys among men in high mobility occupations and who spend periods of time away from home in West Africa – police, military, truckers, miners, fishermen, etc. – reported rates of sex with FSWs are usually much higher than in men interviewed in the national population-based surveys. For example, 38% of truckers in Guinea in 2005 reported ever having had sex with a FSW; 9% of policemen in Accra reported sex with a FSW in the last year. While these rates are likely to be higher than among non-mobile men, it has also been suggested that men in BSS studies report commercial sex more accurately than men approached in household-based national surveys.³⁶
- (3) Data collected by Projets SIDA-2 and SIDA-3 among FSWs and their clients in Benin and Ghana also indicate that the number of men visiting FSWs is clearly much higher than reported in population-based surveys.

In Ghana, only 1.2% of men in urban areas reported buying sex in the last year in the GDHS 2003.⁷ However there are an estimated 5,000 female sex workers in Accra, representing 1.1% of the adult female population aged 15-49. These FSWs report between 10 and 20 clients per week. If only 1.2% of the urban adult male population pays for sex as reported in the GDHS 2003, each client would be having sex with a FSW between 10 and 20 times a week! In contrast, male clients of FSWs surveyed in Accra in 2001 actually report a median of 3-5 visits *per year*. The true proportion of men buying sex in Ghana is thus likely to be very much higher than 1.2%.

Using the ‘indirect’ method (section 5.1.2), it was estimated that 30% of the adult male population in Cotonou,^{133,134} Benin and 50% of the adult male population in Accra,¹⁰³ Ghana, are clients of sex workers; and that the PAF of prevalent HIV among men for sexual contact with FSWs was > 75% in both these settings (see case study on Benin in section 5 for more details). In preparing this report, we made similar calculations for the Rufisque and Tambacounda regions in Senegal, where an IBBS was carried out among FSWs and their clients by Projet SIDA-3. Assuming HIV prevalence in the general population of men found in the 2005 Senegal DHS, and a conservative estimate that 0.5% of the population of women aged 15-49 are involved in sex trade,¹⁴⁴ we computed a PAF of 80.5%. This means that, in these locations, over three quarters of prevalent HIV infections in men are directly attributable to sex with FSWs, through outwards first-wave transmission.

- (4) Recent data collected as part of a general population survey carried out in Cotonou in early 2008 using polling booth survey methodology to reduce social desirability bias, provide support for the validity of the above estimates. In this survey, 24% of married men and 16% of unmarried men reported sex with a FSW in the last year (unpublished data).

Evidence is accumulating that **MSM are also an important core group**, although as yet data are lacking in many countries. HIV prevalence varies between 13.5% and 25.3% in different countries (Table 4), and this is much higher than any other group of men considered at high risk. Available behavioural data indicate that they are at high risk of contracting and transmitting HIV, due to high rates of unprotected anal sex and multiple partners. High levels of bisexuality and low levels of condom use with female partners indicate that this population could also act as an important bridging population. In Senegal, where prevalence of 21.5% has been found among MSM in Dakar, and assuming that 3% of the male population engage in male-to-male sex, it has been estimated that 20% of current HIV infections could be due to sex between men.²⁹

The size of the MSM population and the percentage of adult men practicing male-to-male sex in sub-Saharan Africa are unknown. However, in polling booth surveys carried out as part of a recent general population survey conducted in Cotonou in early 2008, 7% of men reported ever having had anal sex with a man (unpublished data).

Amongst West African countries, the problem of **injection drug use** is most frequent in Nigeria. HIV has not yet spread extensively through this route in Nigeria, although there are indications of increasing HIV prevalence among IDU in very small survey samples -- in a recent IBBS, HIV prevalence was 5.6% among Nigeria's IDUs.¹⁰⁴ The potential for HIV spread among IDUs is present and real, and estimation of the size of the IDU population, appropriate HIV surveillance as well as the development of preventive interventions for this population are important, not only in Nigeria, but in all West African countries. It is also important to note that there seems to be a link between sex work and injection drug use in Cape Verde and Sierra Leone.^{100, 145}

The feminisation of the epidemic seen in many general population studies in West Africa is also characteristic of its maturation. Increasing prevalence in women, and increasing female: male HIV prevalence ratios are often seen as indicative of generalization of the epidemic. However, in a context of nearly universal male circumcision (as is the case in West Africa), combined with decreasing HIV incidence among men, such trends could also indicate that the epidemic is in a late concentrated phase.

Female-to-male transmission is greatly reduced when men are circumcised.⁵²⁻⁵⁴ Also, STIs are now less present (see serial IBBS data from Projet SIDA-3 in Table 7) and condom use is quite high in transactional sex. Thus, current incidence among men may have decreased, and may now not be high enough to counterbalance the AIDS-related deaths occurring among them, resulting in a decrease in prevalence. Prevalence has not yet decreased (as much) in women because many women who are currently infected became so after their male partners, and thus survive them.

In summary, the available data suggest that the epidemics in most West African countries: (a) are *largely* concentrated, with, in most cases, the majority of infections in men and women in the general population due to sex with FSWs (and other high risk populations including MSM); and (b) are in a late – plateau or decline – phase.

Taken together, the above data from Benin, Ghana and Senegal, in combination with data from other countries showing very high differentials in prevalence between FSWs and the general population, indicate that outwards transmission of HIV from FSWs to their clients and onwards to women in the general population has contributed disproportionately to the spread of HIV in West Africa. Sexual behaviour data from the DHS and other surveys also indicate that there is potential for transmission of HIV *within* the general population. It thus seems very likely that male circumcision has largely protected West African countries from experiencing generalised epidemics.

The observations made above clearly apply to the following countries: Benin, Cape Verde, The Gambia, Guinea, Liberia, Mali, Niger, Sierra Leone, Togo and Senegal. In these countries, there is clearly a highly disproportionate contribution of core groups to the epidemic, while there is also likely to be some degree of sustained transmission within the general population.

In Côte d'Ivoire, the epidemic is clearly more generalised than in any other West African country. This is likely due to rapid spread among core groups in the second half of the 1980s and the early 1990s, with extremely high prevalence among FSWs and a large FSW population, well-documented in Abidjan, combined with high levels of risky sexual behaviour among men and higher than average levels of risky sexual behaviour among women in the general population. These factors led to an epidemic that can be characterised as generalised with some sustained transmission occurring among members of the general population. However, since substantial transmission also still occurs between core groups and the general population through the bridge, it may be more appropriate to characterise the epidemic as “mixed”..

In Ghana and Burkina Faso (mainly urban Burkina), the epidemic has been substantially fuelled by multiple exchanges with Côte d'Ivoire. In the case of Ghana, this was mainly related to the migration of women from Agomanya district to Côte d'Ivoire, where they became infected through sex work, and subsequently returned home and contributed to the HIV spread in this district of Ghana with the highest prevalence in the country. In the case of Burkina Faso, this was related to the very high number of Burkinabè people who migrate temporarily to Côte d'Ivoire for work.

It is interesting to note that the latter three West African countries with the highest HIV prevalence levels in West Africa, have had lower rates of male circumcision than the other West African countries, where circumcision is almost universally practiced (section 4.1)

The epidemic in Guinea Bissau is hard to characterise, as this country is the historic epicentre of the HIV-2 epidemic and because of the lack of recent epidemiological data.

The situation in Nigeria is also difficult to characterise in the absence of population-based HIV prevalence data. But Nigeria is undoubtedly among the countries with the highest burden of HIV in the world. Given large variations in HIV prevalence among ANC populations across states (ranging from 1.6% in Ekiti state to 10% in Benue state in

2005), it is very likely that some regions of this huge country are facing a generalised epidemic, whereas others are facing a concentrated epidemic.

Finally, extensive serial cross-sectional data from Benin and Abidjan, Cote d'Ivoire, and less extensive data from Burkina Faso, Ghana, Guinea, Niger, Senegal and Togo, indicate that preventive interventions targeted towards FSWs and their clients can have a significant effect on HIV/STI and condom use rates among these populations (section 4.5.1). Mathematical modelling using data from Cotonou, Benin, indicate that such interventions can also have a significant effect on HIV incidence and prevalence in women in the general population in the location. The Projet SIDA-1/2/3 interventions implemented over a 15-year period from 1993 to 2007 could have prevented nearly two thirds of new HIV infections in FSWs and half of new infections in women in the general population in Cotonou (section 5.2.3). These data demonstrate the efficiency of interventions targeted towards core groups in the West African context, where high proportions of HIV infections are due to sex between FSWs and their clients.

7. The response to the epidemic in West Africa

7.1. Introduction

This section presents an overview of the history and current situation of the response to the HIV/AIDS epidemic in West African countries. We first give a brief history of the response since the first AIDS cases were reported in the region. Then we discuss the current situation including an analysis of the key drivers, and the response, including the National Strategic Plans / Frameworks (NSFs) currently in place – their structure, content, budget / funding and implementation status (where information is available). We then present a critical analysis of the response, focusing particularly on whether the structure, content and funding of the current NSFs are appropriate for the epidemiological contexts in which they are being implemented. We then make recommendations for how the design and implementation of the response could be improved.

The brief overview of the history and current situation of the response in West Africa in this section attempts to bring out commonalities in the response and the challenges faced in this region.

We focus our analysis in this section specifically on certain components of, and issues related to, the response which we consider to be key for understanding the degree to which country responses are appropriate in the context of the highly disproportionate contribution of sex with sex workers and other high risk populations to the West African epidemics (section 6). We focus mainly on funding for the response; on prevention programs for populations at high risk of HIV infection; on clinical preventive and treatment responses (VCT, PMTCT, ART); and on surveillance, monitoring and evaluation activities.

7.2. Data sources

The amount and quality of information available for analysis of the response to the HIV/AIDS epidemic varied considerably across the countries. In all cases, current and past national strategic frameworks were available, with, however, varying degrees of detail, in particular with respect to financing and budgetary considerations, and monitoring and evaluation (M&E), including indicators and targets. It was challenging and in some cases not possible to obtain the level of detailed information necessary to understand the situation, particularly financing -- the information we have available for characterisation and critical analysis of the response is incomplete. And some data are difficult to compare. This, in addition to covering 10 of the 15 countries in West Africa in this section, necessarily has implications for the completeness of the information presented and the conclusions drawn. Nevertheless, we believe that our analysis is broadly representative of and applicable to the situation in most if not all West African countries.

In addition to interviews with key personnel carried out by in-country consultants, main data sources available for analysis of the response included:

- Current and past National Strategic Frameworks / Plans (normally five-year periods), with overall and component-specific budgetary information where available, including funding by donor, etc.;
- Five and one-year Programs of Work for implementation of NSFs, containing more detail on planned activities, funding secured by budget item, etc.;
- *Ad hoc* publications, periodicals and bulletins published by National AIDS bodies on specific response issues, achievements to date, etc.;
- Various government and external assessments and evaluations of the response;
- Multilateral funding / project documents – Global Fund proposals, President's Emergency Plan for AIDS Relief (PEPFAR) updates, World Bank Multi-Country HIV/AIDS Program (MAP) reports, etc.;
- Country reports on Follow-up to the Declaration of Commitment on HIV/AIDS (UNGASS);
- Data from DHS and similar surveys on screening of pregnant women and access to PMTCT; as well as on HIV testing rates in general.

The discussion of financial and budgetary issues that follows often uses Ghana as an example. This reflects the amount of detailed and publicly available budgetary information available from Ghana, and the quality of its documentation, in comparison to other countries.

7.3. History of the Response

In most countries in West Africa, the first cases of AIDS were reported in the mid-late 1980s. In most cases, this was closely followed by the creation, by national governments, of National AIDS Control Programs (NACP) / Secretariats (NAS) located within the Ministries of Health, as the lead agencies to implement and coordinate national HIV control activities. Short-term (1-2 year) and then medium-term (2-3 year) plans for combating the epidemic were developed. In many cases, however, initially the response to the HIV/AIDS epidemic was not considered a national priority, and the NACPs often had limited funding, influence and ability to act.

Control activities during this period tended to focus on clinical responses to the epidemic, particularly blood safety and iatrogenic transmission, as well as – in some cases - management of STIs; development of laboratory capacity for HIV testing and surveillance; and promotion of safer sex through media and other campaigns directed at the general population.

Challenges, weaknesses and difficulties during this initial period included problems in the medical / clinical response, including absence of official policies on PMTCT; reluctance to treat HIV-positive pregnant women; reluctance to hospitalise people living with HIV/AIDS (PLHIV) due to fear among health workers, weak home-based care, absence of VCT, absence of specific laws to protect the rights of PLHIV; weak M&E and limited surveillance.

7.4. Key developments and the context of the recent / current responses

In the last decade or so, several important events and developments changed the landscape considerably:

In the late 1990s, there was a global shift in characterisation of the HIV/AIDS epidemic as being a developmental rather than a medical / health problem, and the realisation of the consequent need for a multi-sectoral response to the epidemic. Consequently, in the early 2000s, many countries in West Africa set up national coordinating bodies -- National AIDS Commissions or Committees (NACs), under the direct leadership of the countries' Presidents and Prime Ministers, to provide national leadership in the fight against HIV/AIDS. In Côte d'Ivoire, a Ministry for the Fight against HIV/AIDS was set up in 2001. The Permanent / Executive Secretariats of these bodies are tasked with the coordination of all HIV/AIDS activities; promotion and coordination of the multi-sectoral response and its decentralization; mobilization of financial and technical resources; monitoring and evaluation activities; mobilization of civil society, etc. The creation of such bodies, with high-level political commitment and access, represents a strong endorsement of the importance of HIV/AIDS, as hitherto the National AIDS Control Programs / Secretariats had frequently suffered from limited funding, influence and ability to act. The latter bodies now tend to function as technical agencies of the Commissions / sectoral health bodies, providing direction particularly in clinical responses to the epidemic: STI control, VCT, PMTCT and treatment and care of PLHIV.

The national responses are decentralised to varying extents and with varying degrees of success; they are coordinated at the regional, district and community levels through a number of Regional, District and Local AIDS Committees with members drawn from various sectors at the local level as well as from communities. In addition, civil society / Non-Governmental Organisations (NGOs) / community organisations, including PLHIV groups, have become increasingly involved in formulation, planning and implementation of the response.

In the mid-1990s, with the advent of life-prolonging treatment for HIV/AIDS in the form of highly active antiretroviral therapy (HAART) and the formidable reductions in rates of hospitalisations and in mortality and morbidity from AIDS achieved in developed countries with use of this medication, increasingly vociferous calls for making available this extremely costly medication in developing countries were made. During the decade that followed, thanks to the impressive efforts firstly of Brazil, and then South Africa and India, and of treatment activists, in taking on multinational pharmaceutical companies

and manufacturing generic versions of antiretrovirals etc. – as well as the efforts of WHO, UNAIDS and the Clinton Foundation, costs of HAART decreased dramatically from tens of thousands to a few hundred dollars per year. Treatment schedules were significantly simplified for at least some key antiretrovirals, from many to just a few tablets per day. In addition, trials of simple prophylactic ART schedules for PMTCT found them to be effective. Thus, access to antiretrovirals for treatment of AIDS and for PMTCT became more of a possibility for developing countries.

The first large source of funding for HIV/AIDS, the World Bank Multi-Country AIDS Program (MAP), came on stream in 2000,¹⁵¹ and all West African countries except Liberia and Togo have benefited from MAP funds. In addition to country-specific funding, the MAP funded a project for vulnerable populations in the five countries along the Abidjan-Lagos corridor from 2004 to 2007.

In 2001, at the United Nations General Assembly Special Session on HIV/AIDS (UNGASS), heightened political momentum fuelled the vow that the world should pursue a comprehensive, coordinated global response to the AIDS crisis. Member states adopted a powerful Declaration of Commitment and specifically endorsed the call for a global fund, proclaiming that they would “support the establishment, on an urgent basis, of a global HIV/AIDS and health fund to finance an urgent and expanded response to the epidemic based on an integrated approach to prevention, care, support and treatment”.¹⁴⁶ During UNGASS proceedings, the governments of developing countries, including Nigeria and Uganda, pledged millions of dollars of their own resources as a further sign of support for the fund. Pledges from the Bill & Melinda Gates Foundation and other philanthropic organisations were made.

The Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM) was set up in 2002, to be an additional source of funding, and billion of dollars have been pledged by governments, corporations and philanthropic organisations. Funds have been rapidly disbursed through repeated funding application cycles. At the end of 2008, approximately US\$ 6.9 billion had been committed for HIV/AIDS against approved grant proposals in eight funding rounds.

A number of bilateral agencies have diverted some / all of the funding they provide to support HIV/AIDS prevention and care in developing countries away from bilateral projects to multilateral agencies, including, importantly, the GFATM.

Since 2003, very large sums of money have been made available for integrated treatment, care and prevention programs in some developing countries by the United States government. In his State of the Union address on January 28, 2003, President Bush announced the Emergency Plan For AIDS Relief (PEPFAR).¹⁵⁰ PEPFAR is the largest commitment ever by any nation for an international health initiative dedicated to a single disease – a five-year, \$15 billion, multifaceted approach to combating the disease around the world. PEPFAR was reauthorized for another five years in July 2008. The United States now leads the world in its level of support for the fight against HIV/AIDS,

although in West Africa only Nigeria and Côte d'Ivoire are priority 'focus' countries for the PEPFAR initiative.

At the second UNGASS meeting, in September 2003, WHO and UNAIDS declared the lack of treatment in low and middle income countries to be a global public health emergency and launched the "3 by 5" initiative, which aimed to enrol three million people on HAART by the end of 2005.¹⁴⁷ Although it took until 2008 to reach the goal of three million people on ART, it is a formidable achievement.

At the September 2005 World Summit, the UN General Assembly called for the development and implementation of a package for HIV prevention, treatment and care with the aim of coming as close as possible to the goal of **Universal Access** to HIV prevention, treatment and care for all who need it.¹⁴⁸ In June 2006, the General Assembly adopted the Political Declaration on HIV/AIDS, which sets out the requirements for moving countries towards the goal of Universal Access to comprehensive prevention, treatment, care and support by 2010. The commitment to Universal Access is seen as a major milestone on the way to achieving the Millennium Development Goals, in particular Goal 6 - To have halted and begun to reverse the spread of HIV/AIDS by 2015.¹⁴⁹

Finally, partners engaged in the global, national and local response to AIDS agreed on the "Three Ones" principles for making the response to HIV/AIDS more effective – one national AIDS framework, one national AIDS authority and one system for monitoring and evaluation of the response and its impact.¹⁵² The "Three Ones" approach is designed to facilitate complementary and efficient action in support of host nations. The Global Fund, PEPFAR and other major development partners support the multisectoral national responses in host nations through the "Three Ones" principles.

7.5. Current National Strategic Frameworks / Plans

7.5.1. Strengths and weaknesses of the responses to date

After the initial phase of implementation of short- and medium-term plans during the late 1980s and 1990s, and in the context of the major developments discussed above, most countries in the region have produced longer-term, four- or five-year strategic plans / frameworks, and are currently implementing the second (in some cases the first) of these, commencing in 2005/6/7/8 (Table 10).¹⁵³⁻¹⁶²

A number of internal and/or external evaluations and assessments of the implementation of the first NSF / the response to date have been carried out in most countries. Common weaknesses in and obstacles for adequate implementation of the response identified in these assessments include:

- At the structural level, problems in the coordination of the response, including over-complex coordination structures and limited practical use of the "Three

- Ones” principles; inadequate leadership of the coordinating bodies; friction between coordinating bodies and implementation structures (e.g. NAC, old NACP and Health Ministries); insufficient human, material and financial resources to ensure the basic needs of the coordinating bodies at both the central and peripheral levels; high mobility of personnel in the national structures in charge of the response to AIDS; over-centralisation/lack of decentralisation of the response;
- At the financial level, under-budgeting and under-financing of various components of the response; funds not allocated according to evidence-based prioritization;
 - At the level of implementation:
 - a lack of targeting of prevention efforts towards specific populations known to be at high risk of HIV infection, and towards high prevalence areas;
 - over-concentration on general Information, Education and Communication (IEC) and BCC;
 - insufficient monitoring and evaluation;
 - lack and mobility of human resources for program implementation, including for care and support activities;
 - delays in implementing new laws on HIV/AIDS, especially concerning discrimination and stigmatization;
 - persistent stigmatization of FSWs and people living with HIV.

National authorities have taken the conclusions of these assessments into account in formulating and implementing the current NSF. This has enabled improvements in the formulation of current plans in some areas, including planning, budgeting and increased operationalisation of the “Three Ones principles”. In general, the current NSFs have incorporated the objectives and principles outlined in the preceding section, often with the support / collaboration of international development partners, importantly UNAIDS and its partners, in their formulation. Thus, to fulfil the global push towards Universal Access to HIV prevention, treatment, care and support by 2010, Universal Access targets have frequently been incorporated into updated, costed and more prioritized national plans.

7.5.2. Structure and content of the current National Strategic Frameworks / Plans

There are a number of similar components / major axes in each of the plans, including, generally: prevention; care and support; impact mitigation; coordination; monitoring and evaluation; research (sometimes grouped with M&E); capacity building; policy and advocacy; and socio-cultural and legal impacts (sometimes placed under care and support) (Table 10). Detailed objectives / goals are defined for each major axis / thematic area, which tend to be framed in terms of reducing new infections / prevalence; promotion of sexual health; mitigation of the impact of the epidemic on individuals, communities and health systems.

Table 10: Strategic axes and budget of the National Strategic Plans / Frameworks of 10 West African countries

Variables	BF	BN	CI	GH	GU	ML	NA	NG	SN	TG
Years	2006-10	2007-11	2006-10	2006-10	2008-12	2006-10	2005-09	2008-12	2007-11	2007-10
Local currency	Franc BCEAO	Franc BCEA	Franc BCEAO	Cedis	Guinea Franc	Franc BCEAO	Naira	Franc BCEAO	Franc BCEAO	Franc BCEAO
Total budget/Local currency (<i>millions</i>)	121,271 ^a	125,058	297,120	4,864,540	Not available ^b	143,690	Not available ^c	28,687	51,833	60,651
Total budget/ US\$ 000*	250,255	258,070	613,135	516,469		296,519		59,200 ^d	106,963	125,159
Budget per capita – US\$	17.96	30.40	32.99	22.92		25.54		4.46	9.09	20.06
Breakdown by strategic axis^e										
Prevention	36.0%	50.4%	23.8%	32.3%	X	33.6%	X	X	37.3%	32.2%
Care (or Care and Support)	20.8%	34.3%	56.7%	30.3%	X	33.8%	X	X	42.3%	48.3%
Support to PLHIV	27.1%	5.1%	-	-	X	-	X	X	-	-
Coordination	10.3%	4.0%	4.7%	3.4%	X	32.6%	X	X	9.4%	9.0%
Monitoring. & Evaluatn	5.8%	3.3%	4.3%	8.5%	- ^f	-	X	X	10.6%	6.4%
Policy, Advocacy, Environ.	-	-	-	2.5%	-	-	X	-	-	-
Mitigation (Orphan care)	-	-	-	-	-	-	X	-	-	-
Human Rights	-	-	-	-	-	-	-	-	-	1.7%
Socio-Polit & Ethic Environ.	-	-	-	22.1%	-	-	-	-	0.4%	-
Capacity building	-	-	7.9%	-	-	-	-	-	-	-
Resource mob. funding	-	-	-	0.9%	-	-	-	-	-	-
Research	-	2.9%	2.6%	-	-	-	X	X	-	2.4%
Funding obtained (vs. budgeted) Global – 5yrs	92.1% As of June 2005	61.0% As of Nov. 07	96.3% As of June 2006	-	-	50.2% As of Feb 2006	-	-	-	-
Funding obtained (vs. budgeted) - by Year	142% 1 st Year	-	-	47.4% 2 nd Year	-	-	-	-	-	-

a) Burkina Faso. Initial budget: 160,602 Billions CFA. A revision in July 2006 proposed a lower budget: 121,271 Billion CFA - \$190US per capita. The breakdown by axis is from the initial budget.

b) The Xs below correspond to the strategic axes of the 2003-2007 National Strategic Plan, as we did not obtain the 2008-2012 document.

c) The Xs below correspond to the strategic axes of the current National Strategic Plan.

d) The breakdown by axis was not available in the preliminary version of the National Strategic Framework document we obtained. The Xs below correspond to the main components of the 2008-2012 National Strategic Framework.

e) The exact title of the axes may differ in country-specific National Strategic Plans. We however judged them as equivalent.

f) There was no specific M&E budget in the Mali National Strategic Plan since M&E for HIV indicators has been integrated into the National Sanitary Information System.

*Exchange rate - 1st July 2007: 1 US dollar = 484.591 Franc BCEAO, 9438.20 Ghanaian Cedi, 3511.30 Guinea Franc, 129.140 Nigerian Naira (Source: Oanda.com – Currency converter)

Table 11: Ghana National HIV/AIDS Strategic Framework 2006-10: Universal Access National Targets for 2008 and 2010

Programmatic area	Indicator	Data sources	Baseline (year)	2008	2010	Data Collection Type
Impact target	HIV prevalence among people aged 15-49 ¹	GHS	2.7% (2005)	2.1%	1.9%	HSS
	HIV prevalence among young people aged 15-24 ¹	GSS	2.2% (2003)	1.4%	1.2%	GDHS
Prevention						
Impact target	% of HIV-infected infants born to HIV-infected mothers	GHS	30% (2004)	22%	15% ²	Program data
Process target	# of centres providing PMTCT services ³	RCC/MOH	135 (2005)	190	238	Program data
Impact target	% of people aged 15-49 who both correctly identify ways of preventing the sexual transmission of HIV and who reject major misconceptions about HIV transmission	GSS	F-33% M-43% (2003)	F-46% M-54% ⁴	F-50% M-60%	GDHS BSS MICS
Treatment						
Impact target	% of women, men and children with advanced HIV infection who are receiving antiretroviral combination therapy	GHS	3.2% (2005)	42%	66%	Program data
Process target	# of centres providing ART services	RCC/GHS	5 (2005)	50	138	Program data
Process target	# of centres providing VCT services	RCC/GHS	145 (2005)	190	238	Program data
Process target	# of clients tested for HIV at VCT sites and receiving their serostatus results in the past 12 months	RCC/GHS	42,206 (2005)	200,000	300,000	Program data
Impact target	% of HIV positive pregnant women who receive a complete course of antiretroviral therapy to prevent mother-to-child transmission in the last 12 months	GHS	0.45% (2005)	5,000 ⁵	10,000 ⁵	Program data
Process target	# of centres providing PMTCT services ³	RCC/MOH	135 (2005)	190	238	Program data
Care and support						
Impact target	Ratio of current school attendance among orphans to that among non-orphans, aged 10-14 ⁶	GSS	0.92 (2003)	0.94	0.95	GDHS
National commitment						
Impact target	Amount of national funds spent on HIV/AIDS	MoF	Cedi 97 billion (2003)			NASA ⁷
Process target	Resource needs estimated to scale up to 2010 targets and goals	GAC/Future s group	N/A	Yes	Yes	Goals model

¹ Prevalence targets to be monitored using HIV Sentinel Surveillance, annually. Demographic Health Survey will be used to complement the analysis.

² Impact target: 50% reduction of the proportion of infants infected with HIV.

³ Process indicator for the impact indicators under both prevention and treatment.

⁴ Target is set by gender, reducing knowledge gap between the genders, increasing positive behaviours, and reducing spread of HIV, stigma and discrimination.

⁵ The denominator (number of pregnant women) will be determined later, which does not allow calculating the indicator target now. However, the numerator (number of HIV+ pregnant women receiving ARVs) has been set and is used as point of reference.

⁶ Despite the roll-out of ART, increasing number of people continue to die of AIDS.

⁷ National AIDS Spending Assessment. Targets cannot be set, however, an increase in national funding is assumed.

Most countries have formulated a Monitoring and Evaluation Framework, with a set of specifically defined targets to be achieved within a set time period (usually the lifetime of the NSF) and corresponding indicators to enable assessment of the impact of the response and the extent to which the major goals are achieved. Many of these targets and indicators are based on Universal Access outcome measures / targets (Table 11). They include the following main components:

- Specific reductions in new HIV infections and/or prevalence in youth and the general population (normally by 25%);
- Increases in knowledge about HIV transmission and prevention among the general population;
- Reductions in the proportion of HIV-positive infants born to HIV-infected mothers;
- Increases in the proportion of people with advanced HIV infection who are receiving HAART.

In some countries, behavioural and/or biological (HIV/STI) targets have also been defined for specific populations at high risk of HIV infection.

Sets of intermediate performance / process indicators for monitoring the implementation of the response have also been formulated, for example, the number of centres providing ART, VCT and PMCTC services; the number of people tested for HIV; the proportion of funds spent on high risk populations; the amount of national funds spent on HIV/AIDS, etc. (Table 11).

7.5.3. Budget and funding of the current NSFs

Table 10 shows the overall estimated budget and the proportion allocated to each component for the countries for which this information is available. Figure 16 shows the budgetary structure grouped / re-grouped by major component.

In most cases, the budget allocated for treatment, care and support represents about 50% of the total (highest at 57% in Côte d'Ivoire), and prevention is allocated about one-third (lowest at less than 25% in Côte d'Ivoire). In all cases, the high proportion of the budget allocated for treatment and care is due to ambitious targets for increasing the numbers of people in need of ART actually receiving it, to over 70% of those eligible for treatment (Table 12), except for Togo where the target was established before the recent revised estimate of people in need of ART, which is much higher at 41,000¹¹⁷ than the previous estimated of 23,000.¹⁶³

Figure 16: Budgetary structure by major components of the National Strategic Plans / Frameworks for seven West African countries with available data

In some instances, the major components were defined by regrouping separate strategic axes (see Table 10) after careful examination of their content. The following axes were regrouped with Care and Support: Support to people with HIV; Mitigation (Orphan care); Socio-political and ethical environment. The following axes were regrouped with Coordination: Policy, advocacy, environment; Capacity building; Resource mobilisation and funding. Research was included in Monitoring & Evaluation. Human rights is included in Prevention. a) There was no specific M&E budget in the Mali National Strategic Plan as M&E for HIV indicators were integrated to the National Sanitary Information System.

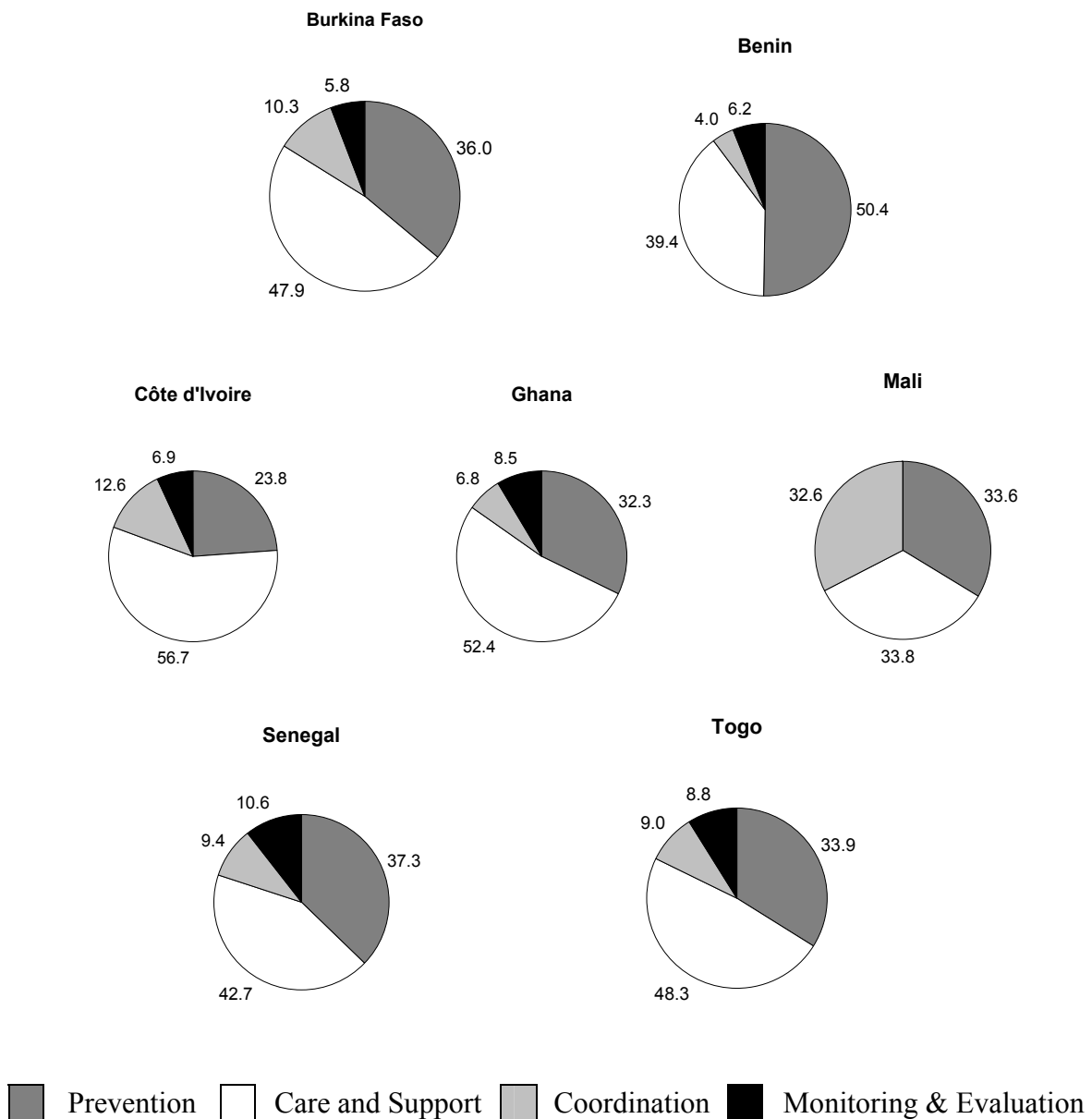


Table 12: Estimated ART coverage in 10 West African countries, at end of 2007

Variables	BF	BN	CI	GH	GU	ML	NA	NG	SN	TG
Estimated no. of people living with HIV ^a	150,000	87,000	750,000	267,000	85,000	130,000	2,900,000	79,000	61,000	110,000
Estimated no. of people in need of treatment ^b	48,000	20,000	190,000	87,000	21,000	30,000	750,000	16,000	12,000	41,000
Estimated no. of people receiving treatment ^b	17,000	9,800	52,000	13,000	5,700	12,000	198,000	1,500	6,700	8,000
Coverage	35.4%	49.0%	27.4%	14.9%	27.1%	40.0%	26.4%	9.4%	55.8%	19.5%
No. of sites of treatment ^c	70 (2007)	43 (2005)	103 (2006)	46 (2006)	14 (2007)	14 (2005) ^d	48 (2006) ^e	11 (2006)	49 (2006)	76 (2006)
Target of no. people receiving treatment ^f	-	14,500 By 2011	104,000 By 2010	66% of PLWHA in need of treatment By 2010	-	-	1,000,000 By 2008-09	80% of PLWHA in need of treatment By 2012	-	11,000 By 2010

a) Source: Country-specific WHO/UNAIDS Epidemiologic Fact Sheets 2006.

b) Source: World Health Organization, UNAIDS, Unicef. Towards universal access. Scaling up priority HIV/AIDS interventions in the health sector. Progress Report 2008; 2008.

c) National Strategic framework/plan of each country, unless otherwise specified.

d) There is no indication of the number of treatment sites in Mali's NSF. These data come from the Mali WHO/UNAIDS Epidemiological Fact Sheet 2006.

e) PEPFAR. 2007 country profile: Nigeria.

f) National Strategic framework of each country.

7.5.3.1. Budget formulation

Countries have made use of various tools developed by UNAIDS, in collaboration with bilateral and multilateral agencies, academic institutions and private organisations, for planning and costing the response. These include the Estimates and Projections and the Spectrum packages, which, based on current prevalence levels and current coverage of prevention and treatment interventions, are used to project HIV prevalence and calculate numbers of new yearly and cumulative infections, numbers of people in need of treatment, and other related variables such as deaths from AIDS, in future years.¹⁶⁴

The budget / costs of implementation of the NSFs have frequently been developed using the Resource Needs Model (RNM). The RNM calculates the total resources needed for prevention, care and orphan support for HIV/AIDS on a national level.^{165, 166} There are three main elements in the methodology of the model: (a) size of population target groups, (b) unit costs, and (c) coverage or access targets. The final expenditure on any program is calculated from these three elements.

The Goals Model, an extension of the RNM, was developed for costing and resource allocation in developing national HIV/AIDS strategic plans, and can be used to see how different patterns of resource allocation would contribute towards program goals.¹⁶⁶ Simulations of the relative cost-effectiveness of specific interventions can support national strategic planning by providing a tool to link program goals, outcomes, and funding.

The Goals Model can be used to estimate the marginal impact of interventions on costs and on the number of HIV infections averted. These data can be combined to calculate the cost per infection averted for each intervention. This can aid governments in making decisions about resource allocation in situations of limited resources and competing needs.

Examples from Ghana of detailed budgets computed using the RNM are shown in Tables 13, 14 and 15.¹⁶⁷ Examples of the application of the Goals Model in Ghana are shown in Table 16 and Figure 17.¹⁶⁸

Figure 17: GHANA: Incremental impact of interventions and incremental budget, Goals Model, 2006-2010

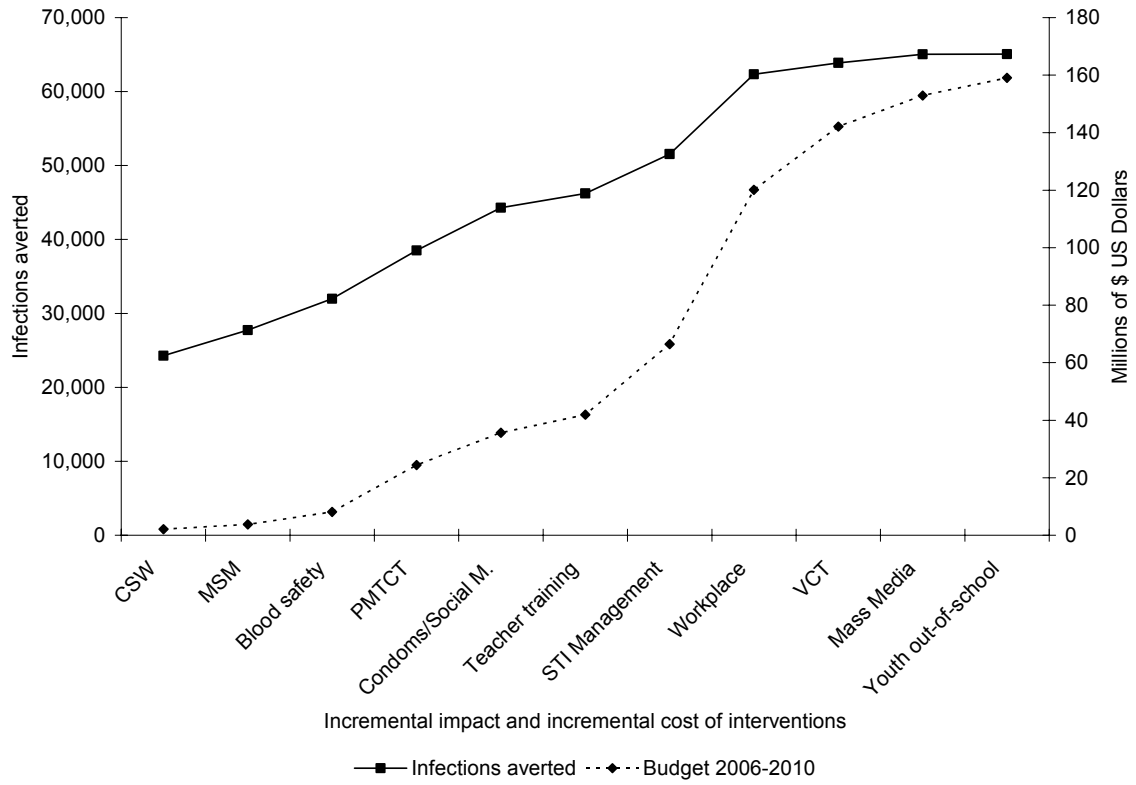


Table 13: Resources needed to implement NSF-II in Ghana 2006-2010 (Resource Needs Model)

<i>Allocation of resource needed</i>	<i>2006-2010</i>	<i>%</i>
<u>Prevention</u>	175,155,790	<u>32.3</u>
<i>Priority populations</i>		
Youth focused interventions	12,505,279	2.3
Sex workers and clients	4,399,840	0.8
Workplace	53,619,409	9.9
Prisoners	413,772	0.1
Migrant Workers	3,772,087	0.7
Truckers	218,160	0.0
Uniform Services	1,311,462	0.2
Refugees	1,278,882	0.2
<i>Service delivery</i>		
Condom provision	11,286,779	2.1
STI management	24,578,521	4.5
VCT	20,783,628	3.8
PMTCT	16,304,305	3.0
Mass media	10,833,333	2.0
<i>Health care</i>		
Blood safety	4,229,065	0.8
Post-exposure prophylaxis	13,231	0.002
Safe injection	-	
Universal precautions	9,608,036	1.8
<u>Care and treatment services</u>	164,091,287	<u>30.3</u>
Home-based care	2,792,670	0.5
Palliative care	2,051,029	0.4
Diagnostic testing	1,168,144	0.2
Treatment of opportunistic infections	2,252,821	0.4
OI prophylaxis	1,218,772	0.2
Lab HAART	8,432,521	1.6
ARV therapy	117,977,131	21.8
Training	10,758,000	2.0
Nutritional support	2,144,853	0.4
Tuberculosis	15,295,347	2.8
<u>Mitigation</u>	119,749,246	<u>22.1</u>
Orphan care	119,749,246	22.1
<u>Policy, advocacy, admin. & research</u>	82,619,338	<u>15.3</u>
TOTAL SUS	541,615,661	100.0
TOTAL Cedis	4,874,540,946,042	

Table 14: Ghana: Breakdown of 2007 work program budget (US \$) by funding source and intervention area

<i>Intervention Areas</i>	<i>Pooled funding</i>	<i>Earmarked funding</i>	<i>Direct funding</i>	<i>Total</i>	<i>Total %</i>	<i>Model needs 2007</i>	<i>% of needs filled</i>
Policy, Advocacy and Enabling Environment	288,694	0	380,000	668,694	1.5	2,330,822	28.7
Coordination & Management of Decentralized Response	2,534,073	1,000,000	1,075,596	4,609,670	10.6	3,107,763	148.3
Mitigating Social, Cultural, Legal, and Economic Impacts	856,230	0	2,530,786	3,387,017	7.8	24,490,304	13.8
Prevention and Behavioural Change	2,078,186	1,170,000	6,042,500	9,290,686	21.4	30,846,257	30.1
Treatment, Care and Support	108,759	0	21,458,540	21,567,300	49.7	22,357,509	96.5
Monitoring and Evaluation, Surveillance and Research	818,397	1,301,189	1,766,161	3,885,747	8.9	7,769,407	50.0
Resource Mobilization and Funding Arrangement	16,549	0	0	16,549	0.04	776,941	2.1
Total	6,700,889	3,471,189	33,253,584	43,425,663	100.0	91,679,003	47.4

Table 15: Ghana: 2007 work program budget (US \$) breakdown for allocation to prevention (communication for behavioural change) activities in most at-risk groups

<i>Prevention</i>	<i>Work program budget</i>	<i>Resource needs model</i>	<i>Gap</i>	<i>% work program total</i>
Prisoners	104,000	79,660	24,340	2.2
Refugees	140,000	233,851	-93,851	2.9
Uniform services	248,538	248,141	397	5.2
MSM	146,500	300,000	-153,500	3.1
Migrant workers	177,373	661,078	-483,705	3.7
Sex workers and clients	715,074	713,025	2,049	15.0
Youth focused interventions	2,101,797	1,935,373	166,424	44.1
Workplace	1,129,934	9,782,320	-8,652,386	23.7
Total	4,763,216	13,953,448	-9,190,232	100.0

Table 16: GHANA: Incremental Impact of HIV interventions in ascending order of unit cost, Goals Model, 2006-2010

Interventions	Infections Averted 2006-2010		Unit cost		Cumulative Impact		Variance		Budget 2006-2010 (\$US millions)		
	Coverage	Targeted	Combined	Targeted	Average	Incidence	Prevalence	Incidence	Prevalence	Targeted	Cumulated
Baseline: No NSF-II						0.32	2.33				
CSW	90	24,285	24,285	85		0.26	2.16	18.80%	7.30%	2.1	2.1
MSM	80	3,602	27,728	489	138	0.25	2.23	21.90%	4.30%	1.8	3.8
Blood safety	96	4,517	31,974	936	252	0.24	2.1	25.00%	9.90%	4.2	8.1
PMTCT	80	6,976	38,515	1,158	533	0.23	2.08	28.10%	10.70%	16.3	24.4
Condoms/Social M.	23	8,410	44,294	1,340	693	0.22	2.04	31.30%	12.40%	11.3	35.6
Teacher training	91	2,616	46,223	2,390	785	0.21	2.02	34.40%	13.30%	6.3	41.9
STI Management	61	8,962	51,545	2,742	1,132	0.2	1.99	37.50%	14.60%	24.6	66.5
Workplace	63	17,906	62,338	2,975	1,725	0.18	1.91	43.80%	18.00%	53.6	120.1
VCT	15	3,381	63,902	6,497	1,996	0.18	1.9	43.80%	18.50%	22	142.1
Mass Media	21	1,490	65,041	7,250	2,114	0.17	1.9	46.90%	18.50%	10.8	152.9
Youth out-of-school	6	117	65,067	52,495	2,199	0.17	1.9	46.90%	18.50%	6.2	159.1

7.5.3.2. Funding of the response

The amount of funding available to support the national response has increased very substantially in recent years, with an emphasis on funding increased access to treatment. Most countries in the region have benefitted from one or more rounds of Global Fund grants, most have World Bank (MAP) and other funding, and Côte d'Ivoire and Nigeria have very large PEPFAR grants which fund the vast majority of their current NSFs. Notable exceptions include Togo which for some time was not eligible for World Bank funding. In general, national governments have committed relatively small proportions - normally between 5% and 10% - of the overall funding needed for the implementation of the NSFs. The private sector generally also only contributes a small proportion of funds.

In addition to the three major funders, bilateral partners from high income countries contribute significant amounts, and large numbers of community organisations and NGOs contribute relatively small amounts of money for specific projects. The African Development Bank is also a contributor in some countries.

Depending on the country and the funder, funds may be given directly to governments; channelled through governments but earmarked for special programs; or given directly to implementing partners.

8. Critical Analysis of the Response

8.1. Is the response appropriate to the prevailing epidemiological conditions and the key epidemic drivers?

Data presented in the preceding sections demonstrate that a high proportion of HIV infections are directly due to sex with female sex workers; and that prevention of transmission outwards from this population could prevent a significant fraction of new infections in FSWs, their clients and other sexual partners, and in the general population. In countries where there is less data available, the very high differential in prevalence between FSWs and the general population, as well as the high number of sex acts reported by FSWs, indicate the disproportionate importance of this population in the epidemic.

Despite this, the key principle underlying the design of the current response in West Africa is Universal Access -- everyone is considered to be at risk, and everyone must be reached by prevention programs. This is laudable, but not epidemiologically sound in epidemics where (a) the risk of becoming infected with or transmitting HIV is *highly unequal* throughout the population; and (b) many health priorities compete for scarce resources.

The RNM, in various forms, was used to estimate the global funding requirements for HIV/AIDS for the United Nations meeting Special Session on HIV/AIDS in June, 2001,

in a context where the HIV epidemics in nearly all countries of West Africa were classified as generalised, and where the target was Universal Access to prevention and treatment. The RNM was applied in costing many of the current NSFs.

In the RNM, interventions targeted to FSWs are included in the response. However, only US \$25 per year per sex worker is allocated for prevention, for interventions solely comprising outreach BCC. Applying the RNM to Ghana, with an estimated 26,000 FSWs and millions of sex acts taking place with clients every year, the total budget allocated to prevention among sex workers *and their clients* over the five years of implementation of the NSF is approximately US \$4 million, or 0.8% of the total budget. This is despite the fact that HIV prevalence is thirteen times higher in FSWs than in the general population, and eleven times higher among clients, and that millions of sex acts take place with sex workers every year. Thus, while epidemiologically sex work may account for as much as three quarters of prevalent infections, the RNM allocates less than 1% of the total NSF budget, and 2.5% of the prevention budget, to prevention of HIV transmission in the sex work milieu. Given an estimated population size of 26,000, this equates to US \$154 per FSW and *all her clients* over the five years of implementation of the NSF. This is only 6.7 times the budget *per capita* for the entire population of Ghana (Table 17).

In the RNM Ghana, priority populations for targeted interventions are defined as youth, sex workers and their clients, the workplace, prisoners, migrant workers, truckers, uniformed services and refugees. This is a very wide definition, and available data indicate that HIV prevalence (and levels of sexual activity / rates of partner change / transmission risk) varies widely across these populations (Table 4, Section 4.4). However this does not seem to be reflected in the RNM, which as stated above is based on the principle of Universal Access. For example, in Ghana, only 0.8% of the total budget (Table 13) and 15% of the BCC budget for priority populations (Table 15) is allocated for FSWs and their clients. Similarly, MSM, with HIV prevalence 17 times higher than the general population of men, are allocated 3.1% of the BCC budget for priority populations; and prisoners, where prevalence is 13 times higher, 2.2%. In contrast, the workplace, where prevalence equates to general population prevalence, is allocated 24% of the budget. Truckers, where HIV prevalence is twice that in the general population, get no specific budget allocation.

In Côte d'Ivoire, where costs were also calculated using the RNM, only 2.5% of the total budget, 10.7% of the prevention budget and 20.6% of the BCC budget is earmarked for FSWs.¹⁶⁹ Similarly in Mali, the proportion of the budget allocated for prevention with FSWs is 0.9%.^{155,170} This equates to US \$126 per FSW *and all her clients* (n=15,591) over the five year period, with a total budget of US \$222 million. This is despite HIV prevalence among FSWs being 27-fold higher than among the general population, and high numbers of weekly reported sex acts with clients.^{5,34,105} Furthermore, this budget is solely for BCC activities, and there is apparently no specific budget provision for clinical services specific to FSWs or other high risk populations. The total share of the prevention budget allocated for FSWs, MSM, men in uniform, prisoners, miners and migrants is 3.7%. Other NSFs do not give details of mechanisms used to formulate their budgets, but are similar in structure and allocation of resources.

Table 17: Ratios relating the budget of the National Strategic Framework of 10 West African countries with some HIV indicators

Variables	BF	BN	CI	GH	GU	ML	NA	NG	SN	TG
Population	13,933,000	8,490,000	18,585,000	22,535,000	9,003,000	11,611,000	141,356,000	13,264,000	11,770,000	6,239,000
Budget HIV per capita US\$	17.96	30.40	32.99	22.92	-	25.54	-	4.46	9.09	20.06
Estimated no. of people living with HIV ^a	150,000	87,000	750,000	267,000	85,000	130,000	2,900,000	79,000	61,000	110,000
Estimated no. of people receiving treatment ^b	17,000	9,800	52,000	13,000	5,700	12,000	198,000	1,500	6,700	8,000
Estimated no. of people in need of treatment ^b	48,000	20,000	190,000	87,000	21,000	30,000	750,000	16,000	12,000	41,000
Ratio budget HIV US \$: estimated no. of people living with HIV	1,667	2,967	818	1,935	-	2,281	-	877	1,753	1,138
Ratio budget Care & Support axis: estimated no. of people receiving treatment	7,051	10,375	6,685	20,817	-	8,351	-	-	6,817	7,557
Ratio budget Care & Support axis: estimated no. of people in need of treatment	2,497	5,084	1,830	3,110	-	3,341	-	-	3,806	1,474
Ratio budget Prevention axis per capita	6.46	15.32	7.85	7.40	-	8.58	-	-	3.39	6.80

a) Source: Country-specific WHO/UNAIDS Epidemiologic Fact Sheets 2006.

b) : WHO, UNAIDS, Unicef. Towards universal access. Scaling up priority HIV/AIDS interventions in the health sector. Progress Report 2008; 2008.

BF: Burkina Faso, BN: Benin, CI: Côte Ivoire, GH: Ghana, GU: Guinea, ML: Mali, NA: Nigeria, NG: Niger, SN: Senegal, TG: Togo

All the NSFs include a list of priority / target / vulnerable populations, which tend to include youth, women, truckers, prisoners, PLHIV, migrants, orphans and other vulnerable children. In Côte d'Ivoire, for example, the priority target populations include: children (0-15 years), AIDS orphans (0-18 years), youth (15-24 years), women and girls, policemen and soldiers, sex workers, migrants and truck drivers, teachers, PLHIV, IDUs, MSM, sero-discordant couples, the work force (in both the public and private sectors), the rural population, and prisoners.¹⁶¹

There is some blurring of the boundaries between sub-groups who are highly socio-economically / culturally *vulnerable* to infection and/or its consequences, and *may* engage in behaviours that put them at risk of HIV infection; and those who are at *much higher risk* of contracting and transmitting HIV than others in the population, and are thus central to the transmission dynamics of the epidemic. These are the key issues that need to be considered when designing a prevention response to the epidemic with limited resources. Thus, in *preventing continuing HIV transmission* within the population, the key issues to consider are: (a) HIV prevalence and sexual contact rates among population sub-groups, and thus (b) what proportion of HIV infections may be due to sex with / among members of population sub-groups, and thus (c) what proportion of infections are likely to be prevented by reducing transmission within / outwards from these groups.

FSWs are always in the lists of priority / target / vulnerable populations, but (except for Senegal where FSWs, MSM and STI patients are defined as 'key most exposed populations'¹⁶⁰), are listed with an equal priority to many other groups, that may represent nearly the entire population. And, in most countries, apart from in this list, the only place where they are specifically mentioned within NSF activities is in the BCC component of prevention. They are infrequently mentioned in the STI treatment component, and in none of the NSFs are they mentioned in the VCT or ART treatment components.

It might be argued – theoretically at least – that in addition to the BCC component specifically allocated for sex workers and their clients, funding for all other aspects of prevention and care among FSWs is included in the allocations for other components, including VCT, STI treatment, ART, PMTCT, etc., and thus that the actual proportion of the budget allocated to FSW is higher than 0.8%. But due to the specific needs of FSWs and also to the highly stigmatised nature of sex work, catering for sex workers in facilities used by the 'general population' has often been found to be unsuccessful. FSWs are unlikely to attend services frequented by the 'general population', in part due to lack of specific training and therefore ability of healthcare workers to attend to their needs in a non-stigmatizing and sensitive manner, or even refusal to treat them if they identify as SW. It is in the interests of HIV prevention and public health to make services for SW as accessible and user-friendly as possible. The best models provide specialised comprehensive services, including peer field outreach, BCC and condom distribution, linked to accessible user-friendly clinical services including STI treatment, other general medical services, VCT, treatment and care for HIV-positive FSWs including ART, and intensive positive prevention with HIV-positive sex workers who choose to go on practising their profession.

The same applies to MSM. The RNM allocates US \$20 per year per MSM for outreach BCC prevention activities. However, where data are available, HIV prevalence is also extremely high in MSM (Table 4). High levels of bisexuality and marriage are reported in available studies, high levels of unprotected anal sex and low levels of awareness of HIV risks among this highly stigmatised and hidden population,¹⁷¹ as well as frequent exchange of sex for goods / money with men and women. There are no published data from West Africa on the proportion of the male population that is likely to engage in homosexual sex, but, in a very recent study carried out in a population-based sample of the adult population of Cotonou, 7% of the men interviewed using a polling booth survey methodology (see Section 5 above for details) reported ever having had anal sex with a man, a figure relatively similar to the commonly cited 5% for high income countries. Even if the actual proportion were to be slightly lower, the combination of risks suggests that substantial HIV transmission could be occurring among and outwards from this population. Despite this, MSM are often not specifically mentioned as targets of prevention activities.

In many countries of West Africa, evaluations / assessments of the early response were critical of the lack of targeting of the response to population sub-groups and geographical areas with high HIV prevalence. In the current NSFs, in general, there continues to be insufficient targeting of resources to high risk populations; and the design of the current response is not wholly appropriate to the prevailing epidemiological situation.

8.2. Are all the necessary components of the response present in order to contain the epidemic?

The overall structure and content of the NSFs are broadly similar. They have been formulated, often with the collaboration of international development partners, primarily WHO, UNAIDS and partners, on the basis of a number of key guiding principles, including the goal of Universal Access to prevention, care and treatment, the Three Ones principles, the need for a decentralised, multisectoral response, and the need for strategic planning, including adequate costing and budgeting of the response. Thus in theory, and in practice if fully implemented in a timely manner with adequate funding, overall the plans contain the necessary elements of a comprehensive response to the HIV/AIDS epidemic. However, while the necessary components are present, as discussed above, due to classification of the epidemics as generalised, there is frequently insufficient targeting of prevention resources for high risk populations. In addition, in many cases there are key elements missing from the planned prevention responses. Notably, HIV-positive people are often missing from the list of priority target populations, and 'positive prevention' is usually given little attention. Where PLHIV are listed among the priority populations, it is usually as people in need of treatment and psychosocial and economic support, rather than as priority populations for prevention efforts.

In addition, and as discussed in more detail in the sections below, a number of issues potentially compromise the full implementation of the NSFs:

- Many countries have not secured sufficient funding to cover the full budget (including Ghana, Benin, Mali, Table 10).
- In these situations, but also even in situations where commitments to providing the full budget have been secured (e.g. Côte d'Ivoire), the treatment, care and support components tend to be sufficiently if not over-funded, and the prevention component tends to be under-funded. This is almost universally the case. In some cases, the M&E and the coordination components are also significantly under-funded;
- Even with funds committed, there are problems with disbursement at various levels in many countries;
- Problems of coordination and inadequate human resources exist in many countries, which may pose challenges for the successful implementation of planned activities.

Overall, significant advances appear to be being made in provision of VCT, PMTCT and HAART, and targets are being met or are on their way to being met. However lack of funding means that some key components of planned prevention activities, notably BCC, are being partially implemented only, since they are the areas which are under-funded. For example, in the Ghana 2007 Annual Programme of Work, due to insufficient funding for prevention, MSM, refugees, migrants and the workplace receive very small amounts of funding falling far short of the amounts that adequate implementation of planned interventions is estimated to cost (even using the RNM discussed above which costs only BCC activities).¹⁷²

The inevitable consequence of a lack of funding for and therefore implementation of planned prevention responses will be increased numbers of new HIV infections, and therefore increases in treatment and care costs. This will further jeopardise the attainment of Universal Access targets.

8.3. Is the structure of the NSF organized in such a way as to ensure efficient implementation of priority interventions?

As discussed above, one of the problems with the current NSFs in West Africa is the lack of definition of, and sufficient funding provision for, a comprehensive response to the HIV epidemic among FSWs and other high risk populations. When budgets are specifically allocated for FSWs, it is very frequently only for BCC through peer outreach activities. Even within the BCC component, there is not always a specific part of the budget allocated for activities targeting FSWs. Funding for other activities, including condom provision, clinical services, HIV testing, treatment and care, is not usually allocated to FSWs or to any other specific target group.

Funding for STI care is specifically allocated to high risk populations, including FSW, in Benin, Burkina Faso, Guinea and Senegal. In Senegal, free STI treatment and care has

been offered to registered FSWs (who are thought to make up about one third of FSWs) within public STI reference centres since the beginning of the epidemic.

Even where funding is specifically allocated for FSWs, it is not allocated in an integrated fashion. In Benin for example, there is a specific division within the NACP for interventions directed towards high risk populations, which is primarily involved with provision of appropriately adapted STI services, principally for FSWs. However, in the current NSF, FSWs are targeted under two different specific objectives: objective 2 which is related to BCC, and objective 4 which is related to STI care. The latter is implemented by the NACP whereas the former is under the coordination of the NAC and is carried out by NGOs who respond to requests for proposals (RFP). The integration of BCC, empowerment activities and clinical care – which was one of the strengths of the recently-terminated *Projet SIDA* which had been implementing interventions among FSWs in Benin since 1992 – is thus not a reality in the field in Benin anymore. This is regrettable, especially given that the model developed by *Projet SIDA-3-Benin* received a best-practice award from the AWARE-HIV/AIDS Project, the West Africa regional project of USAID, and since the latter project has been funding activities to replicate this best practice in other West African countries over the last four years.

Some countries have funding for specific projects dedicated to integrated preventive / care services for FSWs, including the PAPO-HV project in Abidjan, Côte d'Ivoire, projects funded by *Projet SIDA-3* in Burkina Faso (this project was listed in the NSF commencing in 2006, when funding in fact ended), the United Nations Population Fund (UNFPA) and the World Bank in Burkina Faso; the World Bank in Guinea, etc. There may be other projects of this type of which we are not aware. However such projects tend to be small-scale, and do not meet the need for country-wide coverage of FSWs with prevention and care services.

8.4. Is the response adequately funded? Does the budgetary allocation reflect the epidemiological situation and the key drivers in the epidemics?

8.4.1. Estimated budgets

The estimated budget for the implementation of the current five-year NSFs varies between US \$59 million in Niger and US \$613 million in Côte d'Ivoire (budget not available for Nigeria or Guinea) (Table 10). This represents a *per capita* budget ranging from US \$4.46 in Niger to US \$32.99 in Côte d'Ivoire (Table 10).

Table 17 analyses NSF budgets in relation to some HIV indicators. The estimated number of PLHIV varies from 61,000 to 2.9 million. Benin, Burkina Faso, Guinea, Niger, Senegal and Togo all have estimates of $\leq 150,000$ people infected. Ghana has 267,000; Côte d'Ivoire 750,000 and Nigeria 2.9 million.¹¹⁷ One might expect that the total budget allocated for the response would reflect the severity of the epidemic in each country, as reflected in HIV prevalence or numbers of people infected. However, the size of the total

budget relative to the estimated number of adults living with HIV varies considerably, from less than US \$900 per PLHIV in Niger to nearly US \$3,000 in Benin.

The prevention budget *per capita* (total population) clusters around US \$7 *per capita*, being low in Senegal at US \$3.39 and high in Benin at US \$15.32 *per capita* (data not available for Guinea, Nigeria and Niger). This is despite significant differences in HIV prevalence and thus severity of the epidemic in the different countries. For example, Côte d'Ivoire, with HIV prevalence four-fold higher than in Benin, budgets half the amount *per capita* on prevention (Table 17).

The care and support budget component relative to the *estimated number of people in need of treatment* is in the order of magnitude of US \$3,000 per person in most countries, except for Benin, where it is higher at around US \$5,000, and Togo and Côte d'Ivoire where it is less than US \$2,000 per person in need of treatment.

8.4.2. Securing funds for estimated budgets

Due to the large increases in funding available for the response to HIV/AIDS in recent years, with an emphasis on increasing access to treatment, some countries have been able to secure assurances of sufficient or nearly sufficient funding to cover the estimated costs of implementation of their entire 5-year NFS (Table 10). However this is not the case for many countries (Table 10). For example, in Ghana, only 50% of the estimated overall funding required was secured for implementation of the 2006 and 2007 Programmes of Work, and this looked set to continue for the rest of the lifetime of the NSF.¹⁷² In Benin, only 61% of the budget had been secured as of end November 2007,¹⁷³ and in Mali, 50% as of February 2006.^{155, 170}

Furthermore, looking more closely at individual components, and where data are available, it is often the case that funds committed are sufficient to fund the treatment and care components (in some cases these components are significantly over-funded in terms of commitments), whereas funds committed to the prevention components are insufficient to cover needs. In Ghana for example, for 2007, 50% of the *overall* budget required had been secured. However 96% of the budget for treatment and care was secured, but only 30% of the budget for prevention (Table 14). Similarly, in Benin, as of the end of November 2007, funding to cover 61% of the overall budget of the NSF 2007-2011 was identified. The highest proportions of budget identified were for care and support (70%), while the lowest were for M&E (36%) and prevention (54%).

In Côte d'Ivoire, 96% of the overall budget has been secured: nevertheless, only 66% of the prevention budget has been secured, compared to 90% of the care and support budget. Within the prevention axis, the VCT and PMTCT components are massively over-funded (360% and 248% respectively), while only 35% of the necessary budget for BCC has been secured; less than 10% of the budget for positive prevention; 43% for condom provision; and less than 1% for STI control.¹⁶⁹

Two other axes which, depending on the country, are frequently under-funded, are coordination, and research / monitoring and evaluation.

The prevention component of the response is therefore, in general, both under-budgeted and under-funded, while the treatment component tends to be adequately and frequently even over-funded.

8.4.3. Disbursement of funds

Problems can occur with disbursement of funds by funding agencies, and with redistribution of funds, once received, by national authorities to implementing agencies / NGOs.

For example, in Benin, the Global Fund budget was identified as the main contributor to interventions targeting FSWs (while awaiting MAP-II which was delayed to 2008). There have been major disbursement problems so far. Indeed, an RFP requested NGOs to apply in April 2007 for BCC projects targeting FSWs, but the grants were still not awarded at the beginning of May 2008. Furthermore, despite the fact that the NACP requested, in June 2007, already budgeted funds from the Global Fund to cover the salaries of the core personnel of the STI clinic (DIST), which remains the reference clinic and training centre for FSW interventions in Benin, disbursement was delayed and there was no funding available to pay these highly skilled personnel from January 1st, 2008, onwards. Fortunately, the salary problem for the reference clinic staff was solved in May 2008. Such disbursement problems could jeopardize the future of FSW interventions in Benin.

Delays in the implementation of such projects are very damaging, if they result in the loss of highly trained and experienced personnel, and since trust between project implementers and their hard-to-reach, highly stigmatized populations is easily lost.

Problems also occur at the level of actual spending of funds allocated for the response. For example, in Côte d'Ivoire, during the course of the current NSF, whereas 34.5 billion FCFA were committed for the 2006 activities of the NSF (93.4% of the 36.9 billion FCFA budget), only 17.2 billion were actually disbursed (about 50% of the commitment).

8.5. What is the status of implementation of the NSFs: what coverage levels have been reached by the various components of the response?

ART: Table 12 shows progress in reaching targets for access to ART. We have used estimates of the number of people in need of treatment and of those actually treated from the 2008 universal access progress report compiled by WHO, UNAIDS and UNICEF.¹¹⁷

The number of people receiving treatment varies between 1,500 in Niger and 198,000 in Nigeria. End of NSF coverage targets are generally ambitious: two-thirds of those in need in Ghana and Benin, 80% in Niger; and 133% in Nigeria. The apparently more modest targets for Côte d'Ivoire and Togo are related to the fact that the very recent estimate of

people in need of treatment is much higher than the estimate available when the NSF targets were set.

Countries can be divided into three groups according to coverage levels: those where coverage is around one half: Benin and Senegal; those where coverage is between 25 and 40%: Burkina Faso, Côte d'Ivoire, Guinea, Mali, and Nigeria; and those where coverage is lower than 20%: Ghana, Niger and Togo.

In general, there has been an impressively rapid increase in numbers of sites offering HAART and in coverage of those in need in West African countries in recent years, particularly in Benin. It should be noted that people considered as eligible for treatment are those with clinical AIDS and/or a CD4 count of < 200 cells/ μ l.

VCT: Increasing numbers of people are being tested for HIV, and there has also been a rapid scale-up in availability of voluntary counselling and testing centres in West African countries.

Where data are available, HIV prevalence from VCT centres varies considerably among countries, and more so than ANC or population prevalence – indicating variations in risk profile among people getting tested. It would be interesting to investigate the reasons for this further.

Data from the DHS surveys (Table 5) indicate that the proportions of men and women who have ever had an HIV test remain low, varying among men between 3.9% in Niger (2006) and 13.6% in Nigeria (2003); and among women between 1.9% in Niger and 15.1% in Benin. Interestingly, while it might be expected that, due to PMTCT services, more women than men are tested, the ratio of women to men tested in these survey data actually varies between 0.35:1 (Guinea, 2005) and 2.1:1 in Nigeria (2003).

Another very important related issue is people's awareness of their status, particularly HIV-positive people. Among couples participating in the DHS surveys (Table 6), the proportion of HIV-positive men and women who knew their status varied between 5 and 24%.

The rapid expansion of VCT treatment sites has not been without problems. In Benin, a recent study on HIV testing practices indicated that VCT protocols were not appropriately followed in 50% of cases and that 40% of the clientele at VCT centres found waiting times too long and transport costs to the sites too expensive.¹⁷⁴ Overall the proportion of the population tested remains low in most countries.

PMTCT: Data usually available for assessment of implementation and coverage include the number of sites offering HIV testing and PMTCT to pregnant women, the number of pregnant women counselled and tested, and the number who received ART. It is clear that there has been a rapid recent scale-up in most countries in the number of centres and

numbers of women tested and treated. Targets in the NSFs are usually defined in terms either of reductions in the proportion of HIV-positive children born to HIV-positive mothers and/or the proportion of HIV-positive women given PMTCT, with the denominator (number of HIV-positive women) estimated from antenatal clinic data or using an estimation model.

The DHS surveys (Table 5) provide useful data on coverage for at least some countries. They show that overall at the country level, the proportion of women who gave birth in the two years preceding the survey who were counselled and tested for HIV is low, varying from less than 1% in Guinea to 12% in Benin (not available for Burkina Faso, Nigeria, Senegal or Togo). However, these figures are from 2005 or 2006 surveys, and in the case of Ghana from 2003, so coverage is likely to have increased since then, as revealed in the recently published 2008 Universal Access Progress Report.¹¹⁷

FSWs: In most countries, data concerning coverage of interventions for FSWs, or indeed any other population at high risk of contracting and transmitting HIV, are not available. Indeed even during Projet SIDA-3 which implemented FSW interventions in a number of countries, coverage data were available only for intervention sites, if at all.

The denominator data necessary for estimating coverage – the size of the FSW population – is generally only known in the capital / major city if at all. An exception is Benin, where the Projet SIDA-3 intervention was expanded to six major cities / towns covering 70% of all FSWs enumerated in Benin. A country-wide mapping exercise is currently underway to update estimates. A number of mapping studies have also been carried out in Ghana, although the estimates obtained vary widely.

The RNM requires estimates of the number of FSWs (and other high risk populations) in a country for budgeting. It also defines a coverage target – this is often extremely high for FSWs at 90 – 95%. However these estimates are often based solely on expert opinion or guesswork, or using data from one city only, and so are not useful for planning and assessing coverage.

In general, with some exceptions including Benin and Senegal to some extent, there is little evidence of a strategic approach to mapping, size estimation, planning and monitoring of the coverage of interventions targeted towards FSWs. Given the importance of sex work in the transmission dynamics of HIV, such approaches are of the utmost importance.

In most countries, coverage targets are not defined for FSWs in the NSFs (exceptions include Senegal which defines targets for coverage of both FSW and MSM populations). What can be said however is that, due to under-funding of the prevention component of the majority of NSFs, there will necessarily be under-funding of prevention interventions, including, it is likely, those for FSWs (even given the inadequate amount budgeted for these populations, see above). Of note is Ghana, where detailed costing of the BCC component has been carried out in the context of reduced availability of funding for this

component, and BCC for sex workers and their clients has been prioritised over other target groups initially envisaged (Table 15).¹⁷² We do not have information concerning the situation in the other countries.

8.6. Will it be possible to assess the impact of the response with the current M&E plan and surveillance mechanisms?

In many countries, the main process and outcome indicators in the NSFs are based on Universal Access target indicators (Table 11), and address youth and the general population. Indeed, the set of indicators recommended in the context of UNGASS in 2005 was not the same for countries with concentrated epidemics as for countries with generalised epidemics. For the latter, there were no specific indicators for high risk populations.¹³ As the HIV epidemic is still considered as generalised in most West African countries, this largely explains the lack of indicators for high risk populations in most NSFs reviewed for the present report. However, for the data to be collected in 2008, the UNGASS indicators were revised to be the same for all countries, irrespective of the epidemic state and they now cover most of the relevant population sub-groups,⁹⁴ thus recognizing the disproportionate contribution of core and bridging groups to HIV transmission even in generalised epidemics. This new approach is reflected in the indicators proposed by some of the NSFs that were designed most recently.

Specific behavioural and prevalence/incidence targets are often not set for most populations identified as priority targets (apart from youth), including not for FSWs. An exception is Senegal, where specific coverage, behavioural and prevalence targets for FSWs are set for 2011: 75% coverage target for FSW interventions; maintenance of HIV prevalence among FSWs at $\leq 20\%$, rates of condom use with different types of clients; reducing STI rates in FSWs, including from 4 to 2% for gonorrhoea and from 20 to 10% for syphilis. HIV prevalence and condom use targets are also set for MSM. These are probably the most comprehensive of the targets set for high risk populations among the countries studied. In Benin, targets are set for condom use and STI rates. In Guinea in the 2003-7 NSF, a behavioural target is set: 90% of FSWs to have used a condom at last sex.

In a number of other countries, however, targets are not set for high risk populations. In some cases, general population surveys are defined as the sources of data to track changes in prevalence / behaviour in high risk populations. This could make it very difficult to accurately assess the implementation and impact of the response in at least some West African countries. Targets for reductions in prevalence and/or incidence among youth and the general population appear to have been set somewhat arbitrarily at 25% in the majority of cases. There are so many factors that can contribute to overall prevalence, complicating interpretation of either increases or decreases, that it seems a blunt (and given low prevalence, insensitive) instrument by which to measure success. In particular, if significantly more PLHIV are put on HAART within the next few years, there could be an increase in prevalence, even if incidence decreases. Furthermore, given that the majority of HIV transmission is occurring among and outwards from high risk populations, changes in prevalence among the general population, as measured by

population-based surveys (Table 11), may not be accurate, since participation rates, particularly among men in urban areas, who may be those most at risk, are unacceptably low.

Prevalence in pregnant women 15-24 years of age is useful as a proxy for HIV incidence as most infections occurring in this group are likely to be quite recent. However, sentinel sites must be stable over time, and sample size sufficiently large, for such data to be useful.

Assessment of the size and characteristics of the FSW population, introduction of specific process and impact indicators (coverage levels of interventions, behavioural and STI/HIV prevalence) and targets for FSWs and other high risk priority populations would be highly appropriate in all countries, given the importance of these populations in West African epidemics. In order to increase the usefulness of the information and ability to understand the evolution of HIV risk, indicators / targets should be defined for key behaviours and STIs. Studies on HIV incidence would be very useful where possible. Without regular studies of HIV/STI prevalence and behaviour among samples of vulnerable and at-risk populations, such as FSWs, their clients, MSM and prisoners, as well as other potentially at-risk populations such as truckers, it will not be possible either to define and track the role of core group populations in HIV transmission dynamics in West Africa, or to understand the impact of preventive interventions.

9. Recommendations

9.1. Recommendations concerning surveillance and prevention research needs

In light of the analysis of the HIV epidemiological situation in West Africa, we recommend the following course of action:

1. **ANC surveillance** - Expand the number of ANC sentinel sites in many countries where this has not yet been done, including extension to rural areas, to ensure that ANC sentinel surveillance is more representative.
2. **Population-based surveys** - Conduct surveys on HIV prevalence, knowledge, attitudes and sexual and HIV testing behaviour in countries where such studies are yet to be conducted; Repeat such surveys at five-year intervals; Include a component on HIV test results and access to treatment; and Specifically monitor sexual behaviours of PLHIV.
3. **Integrated Biological and Behavioural Surveys** - Carry out systematic IBBS every 2-3 years, which include at least initially a STI component, among:
 - **FSW and their clients** (national coverage);
 - **MSM** (initially in urban areas or locations where this population is reachable, with a view to expanding coverage over time);
 - **Other higher risk populations** including prisoners, the uniformed services, and other groups depending on the specific country.
4. **Specific research studies** - Conduct studies on:
 - **Identification and enumeration of FSWs** including a description of the typology of sex work, the relative contribution of different forms of sex work to the volume of transactional sex overall, and the sexual networks of FSWs comprising different types of paying and non-paying partners (these data are essential for understanding the transmission dynamics of the HIV epidemics and the contribution of sex work to the epidemic over time; and for planning and monitoring the response);
 - **Characterization of the MSM population** including size estimations and operational research on how best to reach this population for preventive interventions;
 - **Assessment of the extent of injection drug use** and its potential contribution to the HIV epidemics;
 - **Men's use of commercial sex and other forms of transactional sex** including the adoption of qualitative and new quantitative interview methods to produce more accurate estimates;

- **Young people** as a key group for monitoring HIV prevalence and sexual behaviour, and investigate the potential increase in transactional sex activity in this group.
5. **Secondary data analysis** – Analyse DHS and other general population HIV prevalence data in more depth to provide a better understanding of the determinants of prevalent HIV infection in the general population.
 6. **Measuring methodology** – Improve the tracking of the epidemics by:
 - **Refining and expanding the 2008 UNGASS behavioural indicators** to ensure that they represent the most appropriate measures of risky behaviour (this would include refining and re-specifying the definition of ‘condom use during higher-risk sex’, adding indicators for extra-marital sex and sex with FSWs, and defining national level coverage targets based on estimates of the size of the high risk population in question), and to ensure that they track the proportion of the NSF budget spent on specific high risk populations;
 - **In areas with established programs for FSWs and other high risk populations, develop a monitoring system with more refined indicators** including an assessment of population denominators for coverage estimates, and a system for tracking the number of people exposed to field interventions, numbers attending clinics for STI management and HIV screening, and the frequency of these activities per individual;
 - **Estimating HIV incidence in high risk populations** by using new testing methodology for measuring recent HIV infections (the ‘detuned’ assay), once this methodology has been well-adapted to the African context.

9.2. Recommendations concerning the response to the epidemic

In the light of the analysis of the response to the HIV epidemic in 10 countries of West Africa, we make the following recommendations:

7. **Recognise the importance of prevention** - Advocate at all levels for increased interest in and funding for prevention initiatives (most countries for which data are available are under-budgeted and under-funded for their prevention component, and over-funded for their treatment component).

High risk populations

8. **Priority groups for prevention** - Define and prioritise target groups for prevention on the basis of relative HIV prevalence and likely contribution to the epidemic:
 - **Core groups** that should be targeted in addition to FSWs include MSM, prisoners and potentially IDUs;

- **Bridging populations** with higher than average prevalence include FSW clients, non-paying partners of FSW including regular partners and men involved in the sex trade, men in uniform, truckers and other mobile men;
 - **Target appropriate BCC to these populations**, as well as making STI treatment and condoms easily available;
 - **Promote HIV testing among males**, particularly when presenting with an STI.
9. **Evidence-informed allocation of resources** – Apportion funding for prevention activities on the basis of the likely relative effect of preventing infections within priority populations:
- **Prioritise funding for prevention activities among FSWs and their clients**, given that a considerable proportion of HIV infections in most West African countries are the result of first-wave transmission outwards from FSWs, and that reducing onwards transmission of HIV from FSWs can have very significant effects on HIV prevalence among the general population;
 - **Fund interventions for higher risk populations in an holistic, coordinated manner**, under one rubric, including a defined minimum package of free-of-charge integrated services (this would include outreach and BCC in collaboration with NGOs, using peer educators; training and support for NGO and peer educators in BCC, empowerment, etc; free condom provision, STI care, VCT and HIV care and support components);
 - **Budget for mapping activities** to estimate the size of higher risk priority populations at country level;
 - **Budget for monitoring and evaluation of the interventions** and the levels of coverage they achieve;
 - **Re-calculate the cost *per capita* of the integrated interventions** and incorporate these more realistic costings into financial costing models used for strategic planning and costing of the response, including the RNM.
10. **Scaling up “what works”** - Interventions for FSWs and other key high risk populations should be scaled up to national or provincial level. Encourage frequent HIV screening among FSWs as well as facilitated access to HAART. Apart from some activities in Senegal, prevention programs for FSWs appear to be small scale and not necessarily strategic. In order to be maximally effective, prevention programs should attempt to cover significant proportions of FSWs throughout the country, using FSW size estimates in a given jurisdiction for planning and monitoring purposes. There are excellent models in West Africa on which to base scaling-up of FSW interventions, such as SIDA-3, PAPO-HV in Côte d’Ivoire, and the Yerelon Initiative in Burkina Faso. There are also models from elsewhere in the world of successful scaling-up of FSW interventions, e.g. the Avahan Initiative in India where coverage of 125,000 different FSWs was achieved within two years.¹⁷⁵

11. **Structural interventions** - In conjunction with directly intervening with the target group, structural interventions including work with police to reduce violence and raids, with men involved in the sex trade (e.g. pimps, brothel owners and personnel, security men, etc) to gain their support, etc., should also be included as part of the package of key interventions for FSWs and other highly marginalised and stigmatised populations, in order to reduce stigma and violence, avoid negative consequences, provide support and protection and create an enabling environment allowing the interventions to function optimally. This is also of great importance for MSM, an extremely stigmatised population in Africa.¹⁷¹

The general population

12. **Strongly link HIV testing, treatment and care with prevention, in an attempt to reduce onward transmission** - The massive expansion of VCT, PMTCT and AIDS treatment services represents a huge opportunity to link care and prevention:

- **Implement couple-oriented services for HIV testing**, with appropriate culturally-specific counselling and support services to avoid negative repercussions of positive diagnoses within couples (violence, etc.). This is particularly important given data from many countries indicating that most HIV infections in couples are in discordant couples (i.e. one partner is positive and the other negative);
- **Strongly encourage pregnant women to be simultaneously tested with their partners;**
- **Promote partner reduction in BCC interventions;**
- Make all possible efforts – at the individual and societal level (media, etc.) – to **reduce the stigma associated with HIV**, increase knowledge and understanding, and encourage and support disclosure of status and adoption of safer sex behaviours by PLHIV;
- **Link VCT services to preventive education for HIV-negative individuals**, using the imparting of a negative test to reinforce continuing safe sex practices;
- **Make efforts to ensure high quality of VCT services** -- pre- and post-test counselling, waiting times, etc.;
- **Link preventive interventions to PLHIV treatment and care activities** in order to **limit onwards transmission of HIV** (PLHIV should be defined as key targets of prevention activities);
- **Link STI treatment services with VCT** - People presenting with STI symptoms (men with urethritis, men and women with genital ulcers, however *not* women with vaginal discharge) should be strongly encouraged to undergo HIV testing. Having an STI is an indication of recent high risk behaviour, and the likelihood of being in HIV primary infection is higher in people with an STI. HIV testing of people seeking care for STIs is thus a prime opportunity to identify new HIV infections and limit onwards transmission.

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