2. STD/HIV Screening, Diagnosis and Treatment Within Reproductive Health Programs in Sub-Saharan Africa

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STDs/AIDS and Reproductive Health in Sub-Saharan Africa

In Africa, human immunodeficiency virus infection is largely transmitted through the heterosexual route. Thus sexually active men and women of reproductive age are equally at increased risk of acquiring the infection. HIV infection is best addressed as a sexually transmitted disease in Africa. It is apparent that in most countries in Africa preventive programs for STDs and AIDS have focused mainly on urban high-risk groups, namely commercial sex workers (CSWs), while relatively little attention has been paid to the spread of the infection among the low-risk behavior groups. It is not surprising, however, that infection among CSWs would find its way to low-risk groups through their sex partners. We have shown in Nairobi that women of low-risk behavior (i.e., those reporting few lifetime sex partners and having a low prevalence of common STDs) are experiencing rapid spread of HIV infection (Hunter et al 1994). In this study a prevalence of HIV infection of 5 percent and an incidence of 2.4 per 100 woman-years was found among women attending two family planning clinics, and it was obvious that their risk was related to the behavior of their male partners. A similar finding has been reported in Uganda, where it was noted that having only one sex partner did not provide complete protection from HIV infection (Malamba et al 1994).

In any country it can be expected that there will be more couples of low-risk behavior than those in high-risk groups. There is, therefore, an urgent need to re-orient the current campaigns against the spread of STD/HIV infections in sub-Saharan Africa in order to address these low-risk groups. For example, a prevention strategy based on the promotion of condom use may meet with a certain degree of acceptance among CSWs, but may not be successful with other groups. In Kenya, the demographic and health surveys as well as data we have obtained through interviews with women in family planning clinics in Nairobi (Mati et al 1995) show that the current use of condoms among women visiting family planning clinics is less than 2 percent. This implies that in spite of the large quantities of condoms distributed to men in Nairobi, hardly any are used in stable relationships. Men are likely to be more willing to use condoms with CSWs but not with their regular partners. A study in a peri-urban area of Uganda has shown that between 1987 and 1992 ever-use of male condoms increased from 4 to 10 percent; however, the frequency of those using condoms remained at 1 percent throughout the same period (Konde-Lule, Musagara and Musgrave 1993).

Contraceptive Use and Risk of STDs/AIDS

Another reason for interest in STDs/AIDS among reproductive health programs is the often-debated association between contraceptive behavior and the risk of acquiring these infections. Contraception is practiced by sexually active individuals who are also at risk of coming into contact with STDs/HIV. It therefore becomes difficult to establish a causal relationship between use of a contraceptive and increase in the risk of infection. On the other hand, certain contraceptive methods reduce the risk of infection. Properly used, the male latex condom can provide a barrier against most of the sexually transmitted organisms, including herpes virus and HIV. In practical terms, however, condom effectiveness depends on how frequently it is used and how it is used and this requires the cooperation of the male partner. The female condom may overcome this
problem, although in commercial sex the desire to accommodate the male customer may determine whether or not it is used.

Spermicides have a bactericidal effect and when used alone or in conjunction with barrier methods may provide protection against most of the STDs. The complaint of irritation associated with the use of nonoxynol-9 seems to be a problem only among women who have intercourse several times a day, and has not been found among women in the low-risk groups. In the former situation, breaks in the vaginal epithelium may facilitate entry of the HIV virus (Kreiss et al 1992).

The use of the IUD has been linked to pelvic inflammatory disease, although the evidence for this association is not very strong. Some studies also have linked the method to chlamydia. It is generally advised that women at risk for STDs should be discouraged from using an IUD.

There are some data showing a relationship between oral contraceptive use and occurrence of cervical ectropion and infection with chlamydia. At the same time, other reports have shown some protection against pelvic inflammatory disease (PID) or reduction in the severity of the condition among pill users. More recently, interest has centered on an association between pill use and increased risk of HIV infection. Whereas the evidence appears strong among high-risk women, studies among low-risk groups have failed to demonstrate this association. If the risk does exist, it must be very small (Kapiga et al 1994; Mati et al 1995).

Integrating STD/AIDS Activities in MCH/FP Clinics

Another rationale for linking STD/AIDS control activities to reproductive health services is that most women of childbearing age will visit a maternal-child health and family planning (MCH/FP) clinic either for antenatal care, child growth monitoring and immunization, or family planning services. The MCH/FP clinic thus offers an opportunity to reach these women with regard to STD/AIDS control. A number of questions remain unanswered, however, regarding the extent of family planning clinic involvement in such activities. These include:

- What kind of STD/AIDS activities can be carried out and at what level of health service?
- How effective is counseling in reducing the risk of STD/HIV infection?
- What aspects of STD/AIDS screening may be incorporated into the family planning program activities?
- What is the appropriate (essential) drug list for treating common STDs in family planning clinics?

To answer these questions it will be necessary to study and test models that may be used by family planning programs desirous of widening the scope of their reproductive health care, especially in relation to STDs and AIDS. In developing such models for Africa, it is important to take into consideration that low literacy levels, poverty and poorly developed infrastructure will be important limiting factors. In Nairobi, we have found that there is significant variation in the level of knowledge about different infections and their symptoms and signs among women attending family planning clinics (Garland et al 1993). In general, knowledge was positively associated with level of education of the women, particularly with regard to modes of transmission of HIV. This suggests there is a need to design STD/AIDS prevention activities that are more accessible to, and better understood by, women who have little formal education. It also suggests that education of women increases their ability to appreciate modes of transmission of STDs/AIDS and thereby increases their awareness of the risk and knowledge of ways to protect themselves.

Availability of treatment for STDs in family planning clinics is an important addition to reproductive health care services for women. In addition to being more convenient, treatment at the FP clinic also avoids the embarrassment associated with referrals to special STD clinics. The need to go to a STD clinic often leads to some women going without treatment or subjecting themselves to under-treatment in the hands of non-medical persons within their communities. Furthermore, wider availability of treatment opportunities for ulcerative diseases may have direct benefit for HIV control. Finally, in the course of diagnosis and treatment of STDs, counseling on the importance of behavior change and use of barrier methods to avoid re-infection also would help in reducing the risk of contracting HIV.

Limitations of Linking STD/AIDS Control to MCH/FP Clinics

The main concern about linking STD/AIDS control activities to MCH/FP clinics is that these clinics are not generally attended by men and the youth may shy away from them for fear of meeting their close relatives there. An important reason men do not visit MCH/FP clinics is that they primarily provide only female-oriented contraceptive methods. In general, MCH/FP clinic staff in most countries are not at ease dealing with men, and would require training and sensitization before they could engage men in discussions regarding reproductive health matters. On the other hand, it has been noted that men are interested in discussions related to family planning and STDs/AIDS (Were 1987). The ability to provide this information could attract men to attend MCH/FP clinics.

In the case of the youth, MCH/FP clinics could organize outreach counseling services targeted at schools or special clinics at times when the facilities are not crowded (e.g., late afternoons or during weekends). As shown in Kenya, one of the main needs of the youth is information and education on reproductive health matters and STDs/AIDS (Kiragu 1989). The youth also lack facilities where they can receive sympathetic treatment for the various reproductive health problems they may have. Currently there is little information about the extent of reproductive health problems among the youth, which makes it difficult to identify risk groups to be targeted by programs. If the confidence of the youth can be gained through well-organized educational sessions, it may be expected that they would tell the counselors whatever symptoms and signs of illness they may be having, or have had in the past. This would facilitate referral for early diagnosis and treatment, thereby avoiding immediate or long-term complications associated with reproductive tract infections (RTIs). Records of such episodes of infection also may be useful in identifying adolescents involved in high-risk behavior, and thus target them for specialized counseling.

Magnitude of STDs/AIDS in Sub-Saharan Africa

Available data show that even though STD rates remain much higher in the high-risk populations (commercial sex workers and STD clinic patients), infections are quite prevalent also among women in the low-risk groups, such as women attending family planning or antenatal clinics. **Table 2-1** shows the median prevalence of reproductive tract infections in developing countries grouped in terms of the degree of STD risk in the population.

Table 2-1. Median Prevalence of RTIs in Developing Countries

DISEASE	HIGH-RISK POPULATION		LOW-RISK POPULATION	
	MEDIAN %	RANGE %	MEDIAN %	RANGE %
Chlamydia	14	2–25	8	1–29
Gonorrhea	24	7–66	6	0.3–40
Trichomoniasis	17	4–20	12	3–50
Syphilis	15	4–32	8	0.01–33
Chancroid	9	3–16	N/A	N/A

N/A=not available
Source: Wasserheit and Holmes 1992.

The prevalence of these STDs among women in the lower risk groups is much higher in developing countries than in industrialized countries. The increase in risk has been reported to be in the range of 10 to 15 times in the case of gonorrhea, 2 to 3 times for chlamydia and 10 to 100 times for syphilis. Reasons for this increased risk include:

- a population structure which is weighted in favor of young people;
- rapid process of urbanization with associated breakdown in traditional systems and norms;

- lower social status of women, denying them control of their sexuality;
- lower income and educational status of women;
- certain traditional customs (e.g., polygamy, sanctioned male promiscuity); and
- limited access to health services, especially for diagnosis and treatment of STDs.

Several studies show increased prevalence of HIV and other STDs in recent years in sub-Saharan Africa. Some of the data are given in **Table 2-2 and Table 2-3**, which show that there are more data available on HIV infection than other STDs. Multiple studies in the same country have shown a rising trend in the prevalence of HIV infection. Current surveys in large hospitals in some east and central African countries indicate that HIV prevalence in maternity units exceeds 20 percent.

Fewer studies have addressed the incidence of HIV among previously reported seronegative women. In the followup of 60 percent of seronegative women attending family planning clinics in Nairobi, we calculated an incidence of 2.4 per 100 women years of followup. Data from the Rakai district in Uganda and the Kagera district in Tanzania also have shown high incidence rates ranging from 1.4–6.8 per 100 person years; it was highest in the age group 20 to 24 years.

Table 2-2. Prevalence (%) of HIV in Reproductive Health Settings in Sub-Saharan Africa

COUNTRY	POPULATION	HIV (%)
Rwanda	Antenatal Clinic	9.3
Cameroon	Antenatal Clinic	-
Kenya		
1986–88	Inpatient	2.6
1988	Inpatient	3.0
1990	Antenatal Clinic	7.2
	Antenatal Clinic	-
	Inpatient	-
1991	Family Planning Clinic	4.9
Tanzania 1991	Family Planning Clinic	11.5
Mozambique	Antenatal Clinic	-
Zaire		
1986	Antenatal Clinic/Inpatient	6.7
1989	Antenatal Clinic	5.3
Malawi 1989	Antenatal Clinic	18.6
Uganda		
1987	General	13.5
1989	General	2.4
Zambia	Inpatient	
1987	Inpatient	12.0
1994		25.0
Congo 1988	Antenatal Clinic	3.9

Table 2-3. Prevalence (%) of STDs in Reproductive Health Settings in Sub-Saharan Africa

COUNTRY	POPULATION	N. GONORRHOEAE (%)	C. TRACHOMATIS (%)	SYPHILIS (%)	T. VAGINALIS (%)
Rwanda	Antenatal Clinic	-	-	-	-
Cameroon	Antenatal Clinic	15	-	-	20.6
Kenya					
1986–88	Inpatient	-	-	-	-
1988	Inpatient	-	-	-	-
1990	Antenatal	-	-	-	-
	Clinic	10	8	-	-
	Antenatal	6.4	8.9	-	-
1991	Clinic	3.2	-	1.9	5.2
	Inpatient				
	FP Clinic				
Tanzania 1991	FP Clinic	4.2	-	2.5	14.3
Mozambique	Antenatal Clinic	-	-	9.8	-

Pelvic inflammatory disease, largely resulting from lower genital tract chlamydial and gonococcal infections, is a serious health problem in sub-Saharan Africa. Other causes of PID include septic abortion, puerperal sepsis or iatrogenic introduction during procedures such as IUD insertion. Damage to the fallopian tubes following inadequately treated PID has been shown to be the leading cause of female infertility in Africa, accounting for nearly three quarters of all cases investigated, as shown in **Table 2-4** (Cates et al 1985). Pelvic inflammatory disease also can lead to increased incidence of ectopic pregnancy, which can result in maternal death when ruptures occur where medical attention is not quickly available.

Table 2-4. Percentage* Frequency of Specific Diagnosis in Female Infertility in Africa and Developed Countries

DIAGNOSIS	AFRICA (%)	DEVELOPED COUNTRIES (%)
Tubal factor	85	36
Ovulation factor	17	19
None found	16	40

*Percentages do not add up to 100 because some cases had more than one diagnosis.
Source: Cates et al 1985.

STDs and Pregnancy Outcome

STDs also have been shown to affect pregnancy outcome negatively. Reproductive tract infections can cause spontaneous abortion, stillbirth, pre-term delivery, low birthweight, congenital syphilis, ophthalmia neonatorum and neonatal pneumonia (see **Table 2-5**).

Table 2-5. Proportion of Pregnant Women Experiencing Adverse Outcomes as a Result of STDs

DIAGNOSIS IN MOTHER	FETAL WASTAGE (%)	LOW BIRTH WEIGHT OR PREMATURITY (%)	CONGENITAL OR PERINATAL INFECTION (%)
Chlamydia	-	10–30	40–70
Gonorrhea	-	11–25	30–68
Early syphilis	20–25	15–50	40–70
Genital herpes			
Primary	7–54	30–35	30–50
Recurrent	-	-	-
Bacterial vaginosis	-	10–25	-
Trichomoniasis	-	11–15	-
No STD	4–10	2–12	N/A

Source: Wasserheit and Hitchcock 1992.

Screening and Diagnosis of STDs/HIV in Sub-Saharan Africa

Facilities for diagnosis of STD and HIV infections in sub-Saharan Africa remain very limited, and most of the reproductive health clinics lack such facilities, especially in the rural areas. Traditionally clients suspected of having STDs were referred to special treatment centers (STCs) which usually are located in urban areas. As a result, no investment was made in equipping other health clinics with adequate diagnostic facilities, nor were appropriate drugs for treatment generally available. Because many RTIs are asymptomatic, many infected persons go without treatment where facilities for screening do not exist. Early diagnosis of asymptomatic infections will not only lead to timely treatment, but also may identify individuals at risk of acquiring HIV infection. Some STDs (e.g., ulcerative infections) may increase the risk of HIV transmission. In addition, several studies have shown significant association between presence of STDs and risk of HIV (Kapiga 1994; Mati et al 1995; Moses et al 1994; Piot et al 1988).Thus the incidence of STDs may be used as an indicator of the level of risk of contracting HIV infection for the individual or community. Changes in the STD prevalence rate in a community also may reflect alterations in behavior, and thus could be used as a measure of success (or otherwise) of an anti-AIDS campaign. Low-cost STD tests offer the opportunity for their use as surrogates to predict risk of HIV transmission.

In setting up a STD screening program, the following constraints, which are discussed in more detail below, should be considered:

- Acceptability by the population to be screened,
- Accessibility by the population to the screening clinics, and
- Appropriateness and affordability (sensitivity and specificity).

Acceptability

In Kenya, it is accepted practice to screen for syphilis in antenatal clinics, usually without specific consent. In our study of women attending family planning clinics in Nairobi (Maggwa et al 1990), more than 90 percent of those receiving pretest counseling agreed to be screened for HIV. Furthermore, there were no significant differences in terms of age, marital status and parity between those who accepted HIV screening and those who declined. Another study from Lusaka (Faxelid et al 1994) has shown that women attending STD clinics were willing to have their sex partners notified of their infection and further agreed to bring them to the clinic. In spite of these findings, we have sensed reluctance among women to be followed up at home with news of their test results because many had not discussed the test with their partners. In general, many issues relating to the acceptability of screening for STDs are not well understood, and further research on acceptability is needed.

Accessibility

Services that are available only in special treatment centers will not be easily accessed by most low-risk groups. STD services already are stigmatized and women often fear being labeled a CSW. In addition, specialty clinics are located only in urban areas, are few and therefore are very over-crowded. Locating service facilities close to the population therefore becomes an important consideration. Providing screening facilities through the network of MCH/FP clinics is a practical option.

Appropriateness and Affordability

Laboratory screening tests for STDs/HIV are expensive and cannot be expected to be available at the primary care level in developing countries for many years. There is an urgent need for simple, accurate and inexpensive tests that can be used at the primary health care level.

In 1991 the World Health Organization (WHO) advocated the use of algorithms based on symptoms and signs of common STDs in order to encourage earlier diagnosis and treatment at the primary health care level. Braddick et al (1990) studied pregnant women in Nairobi to determine the sensitivity and positive predictive value of two independent characteristics predictive of cervical infection with *N. gonorrhoeae* and *C. trachomatis* (presence of endocervical mucopus and induced endocervical bleeding) and a history of more than one sex partner during current pregnancy. They reported that when one or more of these markers were present the test had a sensitivity of 68 percent (95 percent confidence intervals 51–85) and a positive predictive value of 0.35 (0.22–0.47).

Another study in Zaire (Vuylsteke et al 1993) has evaluated the applicability of the WHO algorithm for screening for chlamydia and gonorrhea in antenatal and family planning clinics. They found that where microscopy and speculum examination were not available, use of the WHO algorithm to screen pregnant women for *N. gonorrhoeae* and *C. trachomatis* had a sensitivity of 48 percent and specificity of 75 percent. The addition of speculum examination and microscopy reduced sensitivity to 29 percent but increased specificity to 85 percent.

Using study data from women attending family planning clinics in Nairobi we attempted to construct diagnostic algorithms using those significant risk factors for STDs which are most readily accessible (i.e., history, physical examination and laboratory findings). The resulting algorithm gave lower sensitivities and positive predictive values, although specificities remained high. In the case of gonorrhea, the highest sensitivity of 38 percent was found for any combination of unmarried status, more than one sex partner in the previous year and evidence of vaginal discharge or cervicitis, but the specificity and positive predictive value were low (76 percent and 5 percent respectively) (Costello et al 1994).

In summary, it is obvious that although using risk factors as the basis for diagnostic testing or empirical treatment may be the best option at the primary health care level in most sub-Saharan African countries, it will miss a significant number of cases in low-risk populations.

Treatment of STDs in Reproductive Health Settings

There are several constraints to providing effective treatment of STDs in reproductive health settings in Africa, including:

- delayed seeking of health care, especially among rural populations;
- inadequate diagnostic facilities; and
- lack of appropriate drugs.

In Africa, sexual matters are a sensitive issue and women hesitate to report symptoms related to their genital tracts. It is necessary, therefore, for gynecologists and other health care workers to include direct questions related to genital tract infections in their history taking. Because of the stigmatization of STDs, symptomatic women will hesitate to seek help, fearing confirmation of infection. Alternatively, they will opt for self-medication or seek help from traditional doctors. A serious situation exists when patients receive antibiotics in inadequate dosages from unscrupulous health workers. This situation has contributed to the occurrence of infections which are resistant to affordable drugs such as penicillin. One

of the strategies to de-stigmatize STDs is to integrate their diagnostic and treatment facilities into primary health care services, including reproductive health programs.

Uncertainties remain as to what to recommend in situations where the diagnostic facilities are weak (see above). It would seem that training of health workers, especially nurses, who are the mainstay of primary level care, is crucial. They need to be trained in the techniques of obtaining better client history as well as performing adequate speculum examination and recognizing abnormalities related to infections. Empirical treatment provided for 1 to 2 weeks may serve as an additional diagnostic tool, with cases not showing a response referred to a higher level for laboratory tests. Development of simple laboratory tests which can be performed in field conditions should be a priority research area.

Counseling is another much needed skill in STD/HIV programs and training of health workers is urgently needed. Since most family planning programs include counseling training for their staff, STD/HIV counseling could be added to the existing curriculum.

Conclusion

STD and HIV infections in sub-Saharan Africa pose a major reproductive health burden. Diagnosis and treatment services need to be included in all reproductive health programs. Obviously the ease with which it will be possible to introduce STD/AIDS activities will vary depending on the resources available at the various levels of health care. Certainly inclusion of STD/AIDS information, education and counseling should be possible at all levels. The high cost of laboratory testing means that these services will remain beyond the reach of most people in the rural areas. All efforts need to be made to develop, test and introduce affordable diagnostic modalities which may be used under field conditions. Experience with syndromic approaches in screening for STDs has not been entirely satisfactory, but in the absence of laboratory facilities these will remain the most practical approach for many outlying clinics in sub-Saharan Africa. Training of staff, particularly nurses, in taking adequate histories and performing speculum examinations may assist in increasing the efficiency of syndromic algorithms. Finally, there is a need to ensure supplies of essential drugs for the treatment of common STDs at the primary level. This will permit early initiation of treatment and thus avoid complications such as pelvic inflammatory disease and its consequences.

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