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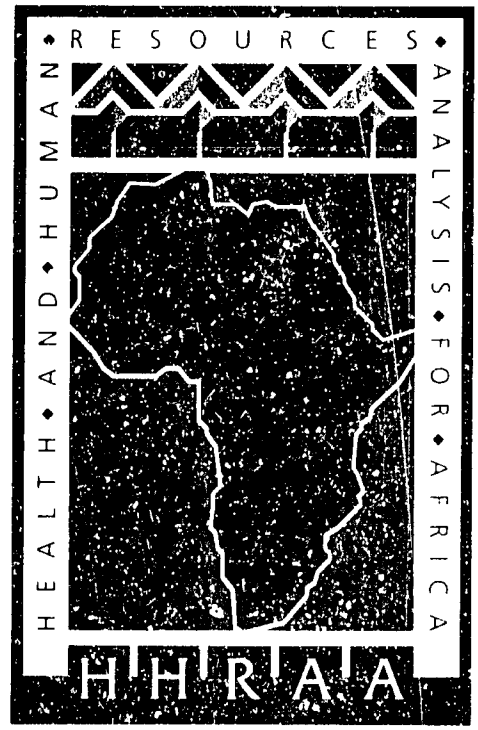
Setting Priorities for Research, Analysis, and Information Dissemination on

HIV/AIDS, STIs, AND TUBERCULOSIS IN AFRICA



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A Strategic Framework for Setting Priorities for Research, Analysis, and Information Dissemination on HIV/AIDS, STI, and Tuberculosis in Africa

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Executive Summary

The human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) pandemic is recognized as a development issue by the U.S. Agency for International Development (USAID). Prevention remains the cornerstone of USAID's HIV/AIDS program and the two thrusts of USAID's program will be:

- achieving impact on the global epidemic by supporting activities focusing primarily on preventing sexual transmission of HIV; and
- identifying and developing innovative and preventive interventions and methods to mitigate impact through a spectrum of activities **including research that will immediately and directly influence the effectiveness of existing programs.**

USAID's Health and Human Resource Analysis for Africa (HHRAA) project: (1) identifies issues of regional significance to African governments, non-governmental organizations, and USAID missions and, (2) supports research, analysis, and information dissemination on these issues—one of which is HIV/AIDS and other sexually transmitted infections (STIs) and tuberculosis (TB), which are inextricably linked to the HIV issue.

Africa is very hard hit by HIV/AIDS and the pandemic will remain a major problem there for the foreseeable future. The strategic framework highlights the areas in which knowledge gaps and research and information needs exist. The framework will also guide HHRAA in selecting research, analysis, and information dissemination activities that will have regional significance and have impact on decision-making for HIV/AIDS programs in Africa, ultimately contributing to the overall reduction of the adverse impact of HIV/AIDS, STIs, and TB in Africa.

The list of research issues is large and daunting. Given the urgent need to use limited funds and resources effectively, research must be well-invested and balanced to improve/increase the potential for existing program impact and to identify new/improved approaches in the area of HIV/AIDS, STIs and TB. Thus, the objectives of the framework are: (1) to identify fundamental information gaps and research needs in key strategic areas; and (2) to prioritize the information gaps and research needs to optimize use of research funds in the development of higher-impact interventions, effective service delivery systems, and better monitoring and evaluation.

The issues identification and prioritization process for the framework development involved: (1) consultations with African researchers and program managers; (2) desk and case study analyses of relevant literature; and (3) consultations with USAID Health, Population and Nutrition staff and their counterparts from USAID field missions in 14 African countries. Based on the results of the issues identification and prioritization process, the key strategic areas that have emerged as priority topics for research, analysis, and information dissemination are:

- information, education, and communication to promote behavior change;
- integrated services: implementation and evaluation;
- policy reform: assessing the impact of the HIV/AIDS epidemic on sectors other than health;
- effectiveness of HIV counseling and testing and community involvement in counseling and testing;
- strengthening STI services;
- monitoring and evaluation; and
- adolescents.

The rationale for selecting these analytic areas for priority research as well as additional research issues in the areas are discussed in Section VI. The discussion of each analytic area in Section VI focuses on three issues: Why is the issue important? What is being done? What remains to be addressed?

Although not prioritized by USAID field staff who participated in the prioritization exercise, Annex A discusses available information on other analytic areas and related research and information needs seen as equally critical (based on USAID's HIV/AIDS strategy focus, relevant literature reviews, and priorities identified by international expert bodies) for the effectiveness of existing HIV/AIDS and STI prevention and control programs. The analytic areas and related research issues discussed include:

- increasing the demand for, access to, and use of condoms;

- targeting;
- women and HIV/AIDS;
- providing a safe blood supply;
- health care and support; and
- addressing tuberculosis.

USAID Africa Bureau's comparative advantage lies in its capacity to do research, analysis, and information dissemination through activities implemented by its cooperating agencies (CAs) and African institutions affiliated with the CAs, by projects such as the AIDS Control and Prevention (AIDSCAP) project; and the Health and Human Resources Analysis for Africa (HHRAA) project, by USAID's interagency support with other U.S. government agencies such as the Department of Health and Human Services, the Centers for Disease Control and Prevention, the National Institutes of Health, and the Bureau of the Census; and by its coordination with multinational organizations, such as the World Health Organization, The World Bank, the African Development Bank, and other UN agencies. Because of the complementary roles played by multilateral and bilateral programs, USAID will now provide support to UN agencies involved in HIV/AIDS prevention as well as directly to selected emphasis countries. Presence of USAID Missions with full-time technical PHN staff in the field also makes USAID well-informed and well-connected at the field level in the implementation of research, analysis, and information dissemination activities.

The strategic framework will be used as a background and reference from which the Health and Human Resources (HHR) Division of the Office of Analysis, Research and Technical Support (ARTS) will select and draft an analytic agenda for research, analysis, and information dissemination each year. Through consultative meetings or regional meetings or conferences, field input will be sought from decision makers and health planners in Africa to refine the framework. And based on new information, recommendations, and demand from the field, the strategic framework will be revised as necessary.

Acronyms

AIDS	acquired immunodeficiency syndrome
AIDSCAP	AIDS Control and Prevention Project
CA	cooperating agency
CAPS	Center for AIDS Prevention Studies (University of California)
CDC	Centers for Disease Control and Prevention
C&T	counseling and testing
CSW	commercial sex workers
DIS	disease intervention specialists
FAO	U.N. Food and Agriculture Organization
FP	family planning
GPA	Global Program on AIDS (WHO)
GUD	genital ulcer disease
HHRAA	Health and Human Resources Analysis for Africa Project
HHR/ARTS	Health and Human Resources Division/Office of Analysis, Research and Technical Support
HIV	human immunodeficiency virus
IEC	information, education, and communication
MIS	management information system
NGO	non-governmental organization
NTP	national tuberculosis program
OC	oral contraceptive

PATH	Program for Appropriate Technology in Health
PPI	priority prevention indicator
PSAPP	Private Sector AIDS Policy Presentation
P/VO	private voluntary organization
/RPR	rapid plasma reagin (rapid serologic test for syphilis)
SARA	Support for Analysis and Research in Africa Project
STIs	sexually transmitted infections
TB	Tuberculosis
USAID	United States Agency for International Development
WHO	World Health Organization

Background

The Situation in Africa

According to the World Health Organization, of an estimated 18 million people infected with the human immunodeficiency virus (HIV) since the global epidemic began in the early 1980s, more than 11 million are Africans. WHO also estimates that of the three to five million who have died so far from AIDS, two to three million were Africans. The number of HIV infections in men and women in the region is more or less equal, with females outnumbering males by six to five. To date, more than 5 million women of childbearing age have been infected. In some urban centers in Africa, more than 25 percent of pregnant women are HIV-infected. Heterosexual transmission has been the predominant mode of transmission in the area, associated with more than 90 percent of all HIV infections; transmission through blood accounted for less than 5 percent of HIV infections; and transmission through injection drug use was associated with a low 0.5 percent (Mann, Tarantola, and Netter 1992).

HIV infection levels continue to increase rapidly throughout Africa. In Zimbabwe it is estimated that more than 600,000 have been infected (World Health Organization 1993). In Nairobi, Kenya, among men attending sexually transmitted infection clinics, HIV sero-prevalence increased eightfold from 3 percent in 1981 to 25 percent in 1991; among pregnant women in Abidjan, HIV-1 infection levels increased from 3 percent in 1986 to 15 percent 1992; and among pregnant women in Nairobi, Kenya, HIV sero-prevalence increased sevenfold from 2 percent in 1985 to 15 percent in 1992 (Mann, Tarantola, and Netter 1992 and U.S. Bureau of Census 1994). And among urban-dwelling adults in many African capital cities, infection rates of 25–30 percent are not uncommon.

HIV is also spreading increasingly into rural Africa, where most of the population lives. For example, in the Zairian province of Bas-Zaire, HIV sero-prevalence in 1989–90 ranged from 7.6 percent in large towns, to 4 percent in small towns, to 2 percent in rural villages (Green et al. 1990). In Côte d'Ivoire, HIV sero-prevalence among rural adults was 2.8 percent, higher than the 1986 sero-prevalence among urban adults in Abidjan (Benoit et al. 1990).

Geographically as well, the HIV/AIDS problem is no longer limited to the countries most severely affected in Eastern, Central, and Southern Africa. Despite earlier data that suggested West Africa was relatively free of HIV infection, reported AIDS cases from West Africa increased steadily during the 1980s. In fact, close to 18,670 cases had been reported from Côte d'Ivoire by February 1994, and Nigeria, once considered an area of minimal spread between the West African and Central African epicenters, is now estimated to have at least 500,000 HIV-infected people (Mann, Tarantola, and Netter 1992).

Implications

Demographic effects. WHO has estimated that between 1985 and 1990, AIDS added 10 percent on average to annual death rates for adults aged 15–49. By the mid-1990s, these rates will increase by an additional 40 percent, and for some age groups, mortality rates could double or even triple. However, contrary to negative growth predictions by some demographic models, AIDS is not expected to lead to a shrinking population in sub-Saharan Africa, where underlying growth rates remain high, although the population structure may be altered. In fact, analysis had shown that national adult HIV seroprevalence of about 50 percent or higher would be required in the sub-Saharan Africa setting to cause population rates to turn negative (Way 1992).

Women, adolescents, and children. Heterosexual transmission has been the overwhelmingly predominant mode of spread since the pandemic began, and as a result, AIDS has struck men and women in this region in an almost even ratio. Infection rates in women aged 15 to 49 have reached as high as 25 percent in some urban areas and high-risk groups (World Health Organization 1989), and AIDS is already the leading cause of death among urban women aged 20 to 40 years (World Bank 1992). Of note is the fact that proportionally more girls and young women in their teens and early twenties are becoming infected than women in any other age group. For example, a 1986 study done in the first 500 AIDS cases diagnosed in Mama Yemo Hospital, Zaire, reported that diagnosed women were on average ten years younger than men, and that there was a sharp peak in AIDS cases in younger women, 20 to 29 years old. Since most of the infected women are of childbearing age, many infants are also at risk as a result of mother-to-child transmission. Of the 1.1 million estimated pediatric HIV infections worldwide (as of January 1992), the vast majority (90 percent) occurred in sub-Saharan Africa. In a study by the International Programs Center of the U.S. Bureau of Census, the projected AIDS epidemic results in a near-doubling of infant mortality in Zam-

bia and Zimbabwe. In countries with more moderate epidemics, the impact is less severe, though still significant. The impact of AIDS on child mortality will be even greater than on infant mortality because many infected children survive more than one year. Furthermore, because of increasing AIDS-related adult mortality, it is estimated that during the 1990s, 10 percent or more of the under-15 year-old population in many African countries will be orphaned.

Economic impact. AIDS predominantly affects adults in their prime sexual and productive ages. Analyses of large national samples from earlier studies in Zaire, Rwanda, and Zambia demonstrating the relationship between HIV infection and socio-economic status, indicated that the more educated, more productive, and wealthier strata of society tended to be hardest hit by HIV/AIDS (Table 1). Thus, investments in education and training will be squandered as the educated become infected. And given the scale of the epidemic in Africa, it is conceivable that growth in per-capita output will be constrained in hard-hit countries, as the social and economic cadre that accounts for productivity and development are undermined in its most productive years. Furthermore, the U.N. Food and Agriculture Organization (FAO) estimates that one-quarter of the farms in the most affected African countries will fail as a result of AIDS's impact on the agriculture work force.

Table 1: The Relationship between HIV Infection and Socio-economic Status

Country (Date)	Type of Sample (Size)	Indicator of S.E.S.	Level of Socio-economic Status			
			Lower	Middle	Higher	
Zaire (1987)	Employees of urban textile factory (5,951)	Job Category	Worker 2.8%	Foreman 4.6%	Executive 5.3%	
Rwanda (1987)	Urban wives in national sample (1,255)	Education of Husband	0-4 Years 18%	5-7 Years 32%	8+ Years 34%	
		Monthly Income of Husband	None 22%	<10,000* 25%	>10,000* 35%	
		Job of Husband	Farmer 9%	Soldier 22%	Private 32%	Gov't 38%
Zambia (1985)	Patients, blood donors and staff of a hospital (1,078)	Years of Education	0-4 Years 8.0%	5-9 Years 14.7%	10-14 Years 24.1%	14+ Years 33.3%

*=Dollar Equivalents
Sources: Allen et al. (1991), Melbye et al. (1986), Ndilu (1988). In Mead Over. The Macroeconomic Impact of AIDS in Sub-Saharan Africa. World Bank Technical Working Paper.

Health. The provision of health care in developing countries is hampered by too few hospitals and clinics and critical shortages of equipment and supplies. Insufficient numbers of doctors, nurses, and other trained health care workers is another serious problem. Uganda, for example, is estimated to have one doctor for every 21,000 patients, compared with one for every 470 patients in Western Europe (USAID Report to Congress 1992).

Under such conditions the AIDS epidemic is intensifying competition for scarce resources. In some countries where HIV-related illnesses are overwhelming health care systems and workers, half the hospitals beds in the central cities are occupied by AIDS patients (Table 2) and care for other diseases is being compromised.

Table 2: Percentages of hospital beds occupied by patients with HIV-related diseases.

Country	Hospital	% beds occupied
Zaire	Mama Yemo Hospital, Kinshasa	50
Zambia	University Teaching Hospital	40-60
Rwanda	Kigali Central Hospital	60* and 50**
Burundi	Bujumbura Prince Regent Hospital	70*
Uganda/ Zambia	Selected rural district hospitals	10-40

** Pediatric ward

* Medical ward

Source: WHO/GPA 1991 **Progress Report**

The HIV-TB link. The HIV-tuberculosis (TB) link is already having a dramatic impact in developing countries where the majority of people with dual tuberculosis and HIV infection live. Currently, four to five million people are estimated to be co-infected with HIV and TB, with 80 percent of this total living in Africa (K. De Cock 1993). The relationship between HIV and tuberculosis is bi-directional—i.e., HIV increases the infectiousness and severity of tuberculosis while tuberculosis complicates the course and management of HIV infection.

HIV-infected persons who harbor latent tuberculosis infection have a six to thirty times greater risk of developing active tuberculosis disease (Mann, Tarantola, and Netter 1992) than those without HIV. Thus, in areas where TB is already endemic, reactivation of dormant TB in HIV-infected people has led to dramatic increases in TB rates. Dual HIV and TB infection is es-

timated to cause an additional 150,000 to 250,000 cases of TB disease each year in sub-Saharan Africa. In Zaire, for example, the number of hospital admissions for active, clinical TB doubled between 1982 and 1990 and among them, half were found to have HIV as well. Active, clinical tuberculosis is a very common opportunistic infection occurring in HIV-infected people, and because it is more easily transmitted to household members and the community, it is creating a new problem for the African health care system already strained and over-burdened by inadequate resources.

Moreover, tuberculosis is fast becoming the prime cause of death in HIV-infected adults in Africa. For example, in Tanzania the TB mortality rate has nearly tripled from 4 percent before the AIDS pandemic to 11 percent among HIV-infected persons in urban Tanzania.

The HIV-STIs link. Most available data suggest that the susceptibility to HIV infection and the infectiousness of an HIV-infected individual are increased several fold by the presence of other STIs (Piot et al. 1988; Pepin et al. 1989). The clearest evidence of the STI-HIV link involves genital ulcer diseases (GUDs), a group of STIs such as syphilis, chancroid, and genital herpes that can cause genital ulcers. Several recent studies have strongly suggested that genital ulcers are a significant risk factor for the heterosexual spread of HIV. The interaction between GUDs and HIV appears to be bi-directional—i.e., GUDs facilitate HIV transmission by increasing the infectivity of HIV-infected persons or by increasing the susceptibility to HIV infection of non-HIV-infected persons while HIV prolongs and augments the infectiousness of individuals with GUDs by altering the natural course of STIs, including their response to treatment.

While evidence for the role of other STIs is more preliminary, recent studies in Africa have suggested that non-ulcerative STIs such as gonorrhea, chlamydia, and trichomoniasis may also enhance susceptibility to HIV infection. This could have profound implications because these non-ulcerative STIs are far more common than GUDs, and are often asymptomatic in women and thus unrecognized. For example, in Africa prevalence rates of gonorrhea range from 1 to 15 percent in pregnant women and from 20 to 60 percent in commercial sex workers (CSWs), while GUD prevalence rates are comparatively lower, ranging from 0.1 to 2 percent in pregnant women and from 5 to 15 percent in CSWs (Goeman, Meheus and Piot 1991). Table 3 shows the degree to which STIs facilitate transmission of HIV.

Table 3: Role of STIs in HIV Transmission

Syndrome	Risk Estimate	
	Median	Range
Genital ulcers	4.7	3.3-18.2
Syphilis	3.0	2.0-18.2
Genital herpes	3.3	1.9-8.5
Chlamydial infection	4.5	3.2-5.7
Gonorrhea	4.7	3.5-8.9
Trichomoniasis	2.7	?
Anogenital warts	3.7	?

Source: Wasserheit, J. (1992). Epidemiological Synergy: Inter-relationships Between HIV Infection and Other STDs. In *AIDS and Women's Health: Science for Policy and Action.*

Purpose of the Strategic Framework

HIV/AIDS is recognized as a development issue by USAID. USAID's Health and Human Resource Analysis for Africa (HHRAA) project: (1) identifies issues of regional significance to African governments, non-governmental organizations, and USAID missions and; (2) supports research, analysis, and information dissemination on these issues—one of which is HIV/AIDS and sexually transmitted infections and tuberculosis, which are inextricably linked to the HIV issue.

As discussed in the background section, Africa is very hard hit by HIV/AIDS and HIV/AIDS will remain a major problem in Africa for the foreseeable future. The strategic framework will highlight the areas in which knowledge gaps and research and information needs exist. The framework will also guide HHRAA in selecting research, analysis, and information dissemination activities that will have regional significance and will affect decision-making for HIV/AIDS programs in Africa, ultimately contributing to the overall reduction of the adverse impact of HIV/AIDS, STIs, and TB in Africa.

Objectives

Prevention remains the cornerstone of USAID's HIV/AIDS program. The two thrusts of USAID's program will be (1994 USAID HIV/AIDS Working Paper):

- achieving impact on the global epidemic by supporting activities focusing primarily on preventing sexual transmission of HIV; and
- identifying and developing innovative and preventive interventions and methods to mitigate impact through a spectrum of activities **including research that will immediately and directly influence the effectiveness of existing programs.**

The list of research issues is large and daunting. Given the urgent need to use limited funds and resources effectively, research must be well-invested and balanced to improve/increase the potential for existing program impact and to identify new/improved approaches in the area of HIV/AIDS, STIs, and TB.

Thus, the objectives of the framework are:

- to identify fundamental information gaps and research needs in key strategic areas, and
- to prioritize the information gaps and research needs to optimize use of research funds in the development of higher-impact interventions, effective service delivery systems, and better monitoring and evaluation.

Issues Identification and Prioritization Process

This involved: (1) consultations with African researchers and program managers in the field, (2) desk and case study analyses of relevant literature, and (3) consultation with USAID field staff.

Consultations with African Researchers and Program Managers

The first issues identification exercise took place in Yaounde, Cameroon, in 1992 with selected African health professionals attending the VIIth International Conference on AIDS and STIs in Africa. The exercise consisted of reviewing conference presentations and materials to identify information gaps and research needs. This was followed by small brain-

storming sessions and personal communication. The second exercise was conducted in Dakar, Senegal, in 1993 with selected participants attending Africa's Progress in Child Survival Conference. A questionnaire was administered to the participants to identify information gaps and needs for child survival programs including HIV/AIDS as well as STIs and TB, which are linked to the HIV issue. The information needs and research priorities identified from the exercises in Yaounde and Dakar constituted a preliminary list of topics that served as a starting point for development of a draft strategic framework. A number of policy formulation and program management issues were also raised as priorities for research and analysis.

Consultation with USAID Field Staff

Based on the preliminary list of topics identified in Yaounde and Dakar as well as desk and case study analyses of relevant literature, a draft framework was developed. The draft framework was then distributed to participants at USAID's workshop[1] in Marrakech, Morocco (held prior to the VIIIth International Conference on AIDS and STIs in Africa). Through a series of priority-setting exercises, workshop participants were asked to identify high-priority areas for research, analysis, and information dissemination, using the following criteria: Does the issue represent an information gap or need? Is the issue important and a priority for African decision makers? Is the issue of regional significance? Can the issue be translated into a research and analysis question or a product for dissemination? Does the issue have potential for direct impact on decision making at the policy or program level?

Priority Research and Information Needs

Based on the results of the issues identification and prioritization process discussed in Section IV, the seven strategic areas that have emerged as priority topics for research, analysis and information dissemination are:

- information, education, and communication to promote behavior change;
- integrated services: implementation and evaluation;

[1]The Workshop participants were Health, Population, and Nutrition staff and their counterparts from USAID field missions in 14 African countries.

- policy reform: assessing the impact of the HIV/AIDS epidemic on sectors other than health;
- effectiveness of HIV counseling and testing and community involvement in counseling and testing;
- strengthening STI services;
- monitoring and evaluation; and
- adolescents.

Questions formulated and chosen by participants at the USAID Marrakech workshop as priority research and information needs in the key strategic areas follow. (The rationale for selecting these analytic areas as priority research areas as well as additional research issues in the areas are discussed in Framework Rationale: Review of Priority Research and Information Needs.)

Information, Education, and Communication to Promote Behavior Change

- What factors contribute to the effectiveness of IEC methods and interventions in promoting behavior change?
- How do we access target groups with appropriate HIV/AIDS, STIs, and TB prevention messages through IEC?

Integrated Services: Implementation and Evaluation

- How can STI control be integrated effectively into a comprehensive health care package with HIV/AIDS prevention programs and other existing health services, such as primary health care clinics, antenatal/MCH clinics and family planning clinics, to make it more accessible and, particularly for women, more acceptable?
- What strategies are needed to make integrated programs work?
- What impact do integrated services have on quality of care and service use?

- How do integrated programs compare with vertical programs (quality, cost, client and provider satisfaction, etc.)?

Policy Research

- How can the effects of HIV/AIDS on other sectors—e.g., education, agriculture, environmental management—be quantified? What are the implications/impact of HIV/AIDS on other sectors?

- How can the cataloguing of: a) project and pilot effort experiences, and b) policy reform experiences, be improved to identify factors that contribute to program success and replicability?

HIV Counseling and Testing

- Is HIV counseling and testing a cost-effective method of changing HIV risk behaviors? Can counseling and testing induce sustained behavior changes?

- What is the cost effectiveness/efficacy of individual vs. couple vs. group counseling?

- What factors contribute to the effectiveness of counseling and testing?

- Can and how should the community become involved in the care and counseling of sero-positive patients? Should HIV results be shared with the community to improve health care and support of sero-positive individuals (shared confidentiality)?

Strengthening Sexually Transmitted Infection Services

- What factors affect use of STI services?

- What are the comparative roles of the private and public sectors in providing STI services? How can the resources of health providers in the private sector (formal and informal) be mobilized and strengthened to reinforce on-going STI control activities?

- What are successful and cost-effective models for partner notification and referral? How should partner notification be conducted in resource-poor settings? Which strategies of partner notifica-

tion best accomplish prevention, early case detection and/or early treatment? Of particular interest are: (a) different cultural responses to partner notification and possible adverse effects on women who notify their male partners; and (b) measures of efficacy, including reduced re-infection rates and reduced community STI burden.

Program Monitoring and Evaluation

- Can simple and cost-effective surveillance systems be developed to monitor the extent of HIV/AIDS epidemic in disadvantaged settings?

Adolescents

- How can governments/leaders and communities be sensitized to gender/age- specific issues and how can projects be designed to incorporate gender/age- specific issues?

Framework Rationale: Review of Priority Research and Information Needs

This section is a discussion of available information on the seven strategic areas identified as priority topics for research, analysis, and information dissemination in HIV/AIDS control and prevention programs. Discussion of each analytic area focuses around three issues: Why is it important? What is being done? What remains to be addressed? Additional research issues (not addressed in the last section, Priority Research and Information Needs) related to the seven identified strategic areas are also presented in this section. These issues have been identified based on USAID's HIV/AIDS strategy focus, relevant literature reviews, and priorities recognized by international expert bodies as research and information needs and gaps conducive to the effectiveness and success of programs.

Information, Education, and Communication Promote Behavior Change

There is general agreement that until a cure for AIDS becomes available, success in HIV/AIDS programs is based on the ability to effectively influence the behavior of large numbers of individuals through information, education, and communication (IEC). Many approaches have been used in public IEC campaigns—mass media programs, peer educators, theater,

the workplace—to promote safer sexual behavior and behavior modification.

However, HIV/AIDS information, education, and communication is valuable only if it leads to change and adoption of safer sexual practices. A 1991 WHO/GPA-commissioned review of 13 studies carried out in six countries to evaluate general AIDS education programs showed that, although there were significant changes in some types of behavior such as condom use, there were no noteworthy changes due to IEC activities in some patterns of risk behavior such as reducing the number of sex partners (Global Program on AIDS, 1991 Progress Report). Based on information gained and lessons learned from the first decade of the HIV/AIDS pandemic, there is a growing consensus about *increased need for social and behavioral research as essential to the development of higher impact IEC approaches.* Experience with behavioral interventions is limited, especially in developing countries, and hardly any information is available on their efficacy in different societal contexts.

Education through different IEC channels can and does produce significant changes in behavior. But for the interventions to be successful, decisions regarding what needs to be changed and how to accomplish these changes must be assisted and supported not only by adequate information and knowledge on different types of behavioral interventions but by access to the means to prevention as well. For example, Population Services International's mass media project in Zaire, which ran in tandem with its contraceptive social marketing effort, resulted in an increase from 28.9 to 45.7 in the percentage of people who reported they were "becoming mutually faithful." In Kampala, Uganda, an extensive USAID-funded research project is examining socio-cultural factors affecting AIDS prevention in a sample of clients at an HIV testing and counseling center. The study explores how knowledge of sero-status affects client behavior and how cultural values influence condom use and risk reduction practices. Results will be used to develop appropriate HIV counseling and condom promotion messages.

More needs to be learned about adolescent sexuality and sexual behavior as well. For example, in Malawi a USAID-funded behavioral research project is analyzing the level of HIV/AIDS/STI knowledge among adolescent girls in four rural villages, the information about sexuality and sexual health delivered by traditional advisors, and approaches used to communi-

cate with the village girls. Research findings from the Malawi project will be used to design a pilot intervention for adolescent girls using traditional advisors as HIV/AIDS/STI educators.

Fundamental to the development of effective IEC interventions is a thorough knowledge of the behavior patterns that facilitate the epidemic. Knowledge of social and behavioral determinants (in adults as well as in adolescents) with respect to high-risk sexual behaviors and practices as well as health care seeking behaviors will be essential if USAID is to successfully influence behavior change and promote safer sexual practices through IEC efforts in the many socio-cultural settings.

Additional research issues:

- Evaluate and validate on-going behavioral interventions and their population impact in different societal contexts.
- What are: (a) predominant norms and values, and (b) socioeconomic and behavioral determinants influencing sexual decisions, risk perceptions, sexual practices as well as health-seeking behaviors in population subgroups (e.g., adolescents, women, migrant laborers, military personnel)?

Integrated Services

Vertical STI and HIV/AIDS programs offer STI or HIV/AIDS services exclusively, are staffed by personnel with specialized training, and are preferred by specialists. Thus, compared with primary care centers, their geographic accessibility is limited for the general population. And specifically for women, because STIs are often asymptomatic in them, women with an STI will have no particular reason to go to an STI clinic, although they may decide to go to a primary health care facility because of urogenital or abdominal problems. Furthermore, the stigmatizing attitude in many STI clinics prevents women from going to them for care. And when women go to a primary health care clinic to seek treatment for symptoms such as vaginal discharge, genital ulcers, or lower abdominal pain, they are usually referred to a separate STI clinic, to which they may or may not go. Integrating STI services in primary health care centers, prenatal, and MCH clinics and/or family planning clinics will increase access to STI services for the general population, particularly women.

Family planning services are already existing access points to reach a broader community of women and these services can do much for STI and HIV/AIDS control and prevention. By counseling and promoting barrier contraceptives at family planning (FP) clinics, family planning programs can help prevent STIs and reduce sexual transmission of HIV. And providing other STI services such as diagnosing and treating STIs also offers significant opportunities for synergistic effects. For example, helping women have healthy babies by treating STIs and preventing adverse consequences of pregnancy is likely to increase women's acceptance of family planning. Also, FP clinics are the only available facilities that routinely perform genital and pelvic examinations and they may also be the only source of medical care for many young, sexually active women. In the U.S. most FP clinics screen and treat clients for STIs, particularly gonorrhea and syphilis.

Conversely, integrating family planning services in STI clinics and HIV/AIDS testing and counseling centers and outreach activities will also be beneficial. At a Baltimore STI clinic in the U.S., a survey of 516 consecutive clients (males and females) revealed that 63 percent would be interested in receiving contraceptive services at the STI clinic. Only 54 percent were using contraception, and only 26 percent were aware that barrier contraceptives and spermicides protect against STIs although most knew that condoms are protective. Based on the survey, the Baltimore City Health Department has begun family planning services at its STI clinics (Family Planning Perspectives 1988).

Family planning services integrated in HIV/AIDS outreach programs can also be valuable. Such programs generally target youth and men for HIV prevention activities and integrating family planning services in these programs offers an opportunity for family planning programs to reach youth and men (generally neglected in FP programs) with FP information.

A variety of approaches are being tried. Some programs such as the integrated MCH/FP program in Botswana and the Municipal Health programs in Zimbabwe with strong family planning components are already starting to address HIV/AIDS prevention activities through information and distribution of condoms in urban and rural areas. In the Gambia, the Gambia Family Planning Association treats women with candidiasis and trichomoniasis, but refers all other women with STIs to government clinics (Sousou 1992). And a number of USAID cooperative agencies (CAs) working in Kenya on AIDS, family planning, and other health issues are

participating in a collaborative effort with NGOs to identify procedures to integrate STIs and HIV/AIDS activities with family planning. Lessons learned from this collaborative effort will be used to develop strategy recommendations in integration.

Integration entails the need for re-allocation of resources, funding, technical assistance, and educational materials as well as creation of policies. It will be necessary not only to create program linkages at the field levels but also to integrate planning and implementation at the top levels. New responsibilities cannot be added without appropriate training, thus staff training will be imperative. Furthermore, logistics systems for supplies and management information systems will have to be strengthened accordingly, if STI services are to be incorporated into FP or primary health care services.

While integration of family planning and STI services seems natural, there is a need to be aware of hurdles that programs will have to overcome. *The biggest barrier programs will face in bringing the fields together is the fact that the most effective choices to prevent pregnancy are not necessarily the most effective for preventing STIs.* Staff familiar with each field will need to be cross-trained so that they are sensitive to and informed about the other; adequate supervision will also be necessary to ensure that STI patients are correctly counseled in contraception and family planning clients with the highest risks for infection are screened for STIs. Integration will require a shift in the focus of IEC activities to emphasize that contraception would reduce not only the risk of unplanned pregnancy but that of STIs and their aftermath. Establishment of effective referral mechanisms will also be critical in an integration strategy. Since it is unlikely that family planning services will initially by fully capable of providing the complete spectrum of services in the other discipline and vice versa, referral systems must be developed. At a minimum, service providers will need to know where other services are available, as well as a mechanism to monitor and follow-up referred cases.

Some family planning agencies working in areas of low contraceptive acceptance fear that involvement in STI/AIDS-related activities could stigmatize their services and keep potential clients away, while some health personnel feel that the addition of new responsibilities could overwhelm the staff within current structures. And as in the case of Uganda, misconceptions by program leaders related to the importance of the two facets of the program and ambivalence regarding the role of oral contraceptives

(OCs) (the emphasis on OCs by FP programs) and the role of condoms (the emphasis on condoms by HIV/AIDS programs) are but some of the constraints faced in program integration. These constraints indicate *a lack of information on service integration. Models of appropriate integration strategies need to be developed. More studies on impact as well as cost-effectiveness of integrated services need to be done as well.*

Additional research issue:

- What are the economic aspects of integration? Should there be an element of cost-recovery?

Policy Research

Prevention programs and research (operations research, behavioral research) alone will not be able to stem the tide of HIV/AIDS. Gaining the support of key public and private sector policy makers for HIV/AIDS prevention efforts is critical. Research for policy reform and development of policies that will reduce barriers to program effectiveness and create a favorable policy framework must be supported. Within this context, efforts should stress: (a) increasing the awareness of policy makers, (b) increased focus on the private sector, and (c) creating a favorable policy framework.

Increasing the Awareness of Policy Makers

Quantitative and epidemiological research to *increase the awareness of policy makers about the potential impact of HIV/AIDS on development and the impact of development on the spread of the disease* is critical.

1. Modeling. *Modeling the course of the epidemic is one of the major tools used in policy dialogue and reform.* Modeling uses available demographic and epidemiological data to project of the future course of HIV/AIDS for a specific country or region of a country. These presentations increase policy-makers' awareness of the magnitude of the problem and provide a forum for discussions and action. Modeling exercises have already been completed by USAID, through the AIDS Control and Prevention Project (AIDSCAP) in collaboration with USAID field Missions in Côte d'Ivoire, Colombia, and Honduras, and future modeling will be undertaken in Kenya, Jamaica, and Rwanda.

2. Assessing the Impact of AIDS on Development. Another effective policy reform tool is assessing the impact of AIDS on development. *Studies documenting the adverse impact of the epidemic on the community, families/households, agricultural sector, industrial sector, social sector, and political sector will provide important information in the formulation of future development strategies and the integration of HIV prevention activities into other development programs.* A comparative review of five studies on the economic impact of HIV/AIDS in Africa revealed shocking results (Aron and Davis, 1993). For example, the lifetime cost of caring for a person with AIDS ranges (in 1985 U.S. dollars) from $104, the low end of the range in Tanzania, to $1,585, the high end of the range in Zaire. In addition, macroeconomic effects are likely to be seen in the inability to replace skilled and educated workers and on key exports such as agriculture. These assessments highlight HIV/AIDS as a development issue and place the epidemic in a wider socio-economic and inter-sectoral context. To date, AIDSCAP has done economic impact assessments in Honduras and has work planned in Jamaica, Kenya, and Rwanda. USAID's Africa Bureau, through the Health and Human Resources Analysis for Africa (HHRAA) project, has also given a grant to The World Bank to assess the economic impact of fatal adult illness due to HIV/AIDS and other causes. The study is designed to provide answers to the following questions: How does the disease burden in Africa affect the stability and productivity of households, communities, and businesses? What actions or programs can be undertaken to mitigate disease burden?

3. Assessing the Impact of Development on HIV/AIDS. The dynamics of disease may also interact directly with the dynamics of development—i.e., the development process itself can generate adverse health consequences. In areas where male migration is common (to work as migrant laborers in mining projects, construction projects, agriculture projects), the chances of men getting infected through casual contacts with commercial sex workers during their period of separation from spouses and subsequently infecting their spouses, are considerably increased. Similarly, in some areas of Africa where male migration is pervasive and females and children are left behind, economic support from the migrant husband is often not enough, necessitating women to use sexual favors as a means of obtaining economic or social support (Post 1993). A study comparing HIV sero-prevalence data from East, Central, and Southern Africa with patterns of labor migration reveals that sero-prevalence rates were highest in areas to which migrant laborers were attracted and the next highest rates were in areas where they came from ((Hunt 1989). *Little information is yet available on such conditions*

and situations putting men and women at increased risk as a result of the development process. Therefore, it is necessary not only to assess the impact of HIV/AIDS on development but also to assess the impact of development on HIV/AIDS so that policies to minimize vulnerability to HIV infection (e.g., new employment benefits allowing men to bring families with them to their work locations, legal reforms for women to improve their economic opportunities such as credit and land ownership rights) can be identified and developed.

4. Cost-benefit and Cost-effectiveness Analyses. Policy makers and health planners need to know more than the economic impact of the disease. An economic impact assessment providing a total or per average capita cost of disease is only a first step to identify priorities among health problems. For decisions regarding interventions, cost-benefit and cost-effectiveness analyses will be required. Cost-benefit analysis will answer the question: is a particular procedure worth doing? Cost-effectiveness analysis, on the other hand, concerns operational efficiency and deals with the question: of the various interventions for a health problem, which will have the most impact at the lowest cost? Cost-benefit analysis is useful for comparing development strategies across sectors, for example, investment in the health sector or the agriculture sector. On the other hand, cost-effectiveness analysis is used to compare the ability of various interventions to achieve a specified health objective. Thus, *for decisions regarding interventions, policy makers and health planners should always consider carrying out cost-benefit and cost-effectiveness analyses wherever possible.*

Increased Focus on the Private Sector

USAID's Africa Research and Technical Support Division, through the AIDSCAP project Policy Unit, is funding research to develop a policy-oriented HIV/AIDS prevention training package for workplaces called Private Sector AIDS Policy Presentation (PSAPP). PSAPP will demonstrate to private sector managers the financial/business merits of investing in workplace-based HIV/AIDS policies and prevention programs. PSAPP will also provide managers and workers' groups with policy-based information and guidelines (for example, health benefits, medical confidentiality) that will help them to implement appropriate policies and prevention programs in the workplace. The initial needs assessments component of PSAPP is already underway in Kenya and Senegal. Nevertheless, with public sector health budgets already stretched, *research to increase the awareness and role of*

the private sector in HIV/AIDS prevention is now being increasingly recognized as essential to successfully combating HIV/AIDS and more information is still needed in this area.

Creating a Favorable Policy Framework

To create a favorable policy framework, *policy research should be in the dual context of supporting those elements that are effective and modifying those that are obstacles.* Within this framework, a policy research and dialogue area could include *assessing the feasibility of removing or lowering taxes, licensing fees, and import duties on prevention commodities* used in HIV/AIDS programs.

Another policy research and reform target should be influential groups. To create a favorable policy framework, open dialogue with leaders and decision makers is crucial. And to establish open dialogue, *information regarding policies, processes, and concerns of influential organizations and groups regarding HIV/AIDS will be essential.* A number of influential groups (government, non-government, private voluntary) influence formation of policies. These groups play important roles in establishing social norms and ethics. For example, resistance from policy-makers, religious leaders, and media managers has often limited condom promotion. Either through government regulation or broadcasting industry codes, many countries do not permit television and radio advertising of condoms. Thus, organizations and influential groups with policies and processes that impede HIV/AIDS program implementation need to be targeted so that their concerns can be identified and addressed, and approaches can be established to overcome their resistance. Likewise, it is extremely important to identify and support existing institutions, policies, and processes that support HIV/AIDS programs. For example, while some religious groups oppose condom promotion for fear that it encourages sexual permissiveness, other religious groups are supportive and have taken the leadership role in supporting and caring for AIDS patients and orphans. Recognizing this, AIDSCAP is planning studies to examine official religious policies and practices on HIV/AIDS as well as the responses of religious leaders and their constituents to such policies.

Additional research issues:

- **How does the disease burden in Africa affect the stability and productivity of households, communities, and businesses?**

- What strategies have families and communities developed to mitigate the social and economic impact of adult deaths from AIDS and how can they be reinforced? What actions or programs can be undertaken to mitigate disease burden?

- What conditions/situations are putting men and women at increased risk of HIV as a result of the development process? What actions or programs can be undertaken to minimize vulnerability to infection under such circumstances?

- How can public-private partnerships be established and community-based organizations' capacity be strengthened to complement and facilitate the implementation of HIV/AIDS, STIs, and TB control and prevention programs?

- How can the resources and interests of private sector employers be mobilized and strengthened to mitigate the effects of the HIV/AIDS pandemic on the work force?

- How can research results be translated into policy and action to the prevent and control HIV/AIDS, STIs, and TB in Africa?

HIV Counseling Testing

Voluntary counseling and testing (C&T) has been shown to induce behavior change in some high-risk groups in the United States. An evaluation study conducted in Uganda at the AIDS Information Center (a facility offering free voluntary counseling and testing in Kampala), showed that the program was able to induce behavior change among its clients. Clients reported substantial changes in certain risk-reducing behaviors, including monogamy and condom use with regular and non-regular partners. These changes were reported by sero-positive and sero-negative individuals, although sero-positives showed greater increases in condom use than sero-negatives. An increased proportion of sero-positive individuals also reported that they were abstinent after the intervention. On the other hand, sero-negative individuals reported abstinence less often after the intervention (Workshop presentations at the IXth Berlin Conference on AIDS 1993).

Voluntary C&T can play an important role in HIV/AIDS prevention, but *it must be part of a comprehensive program where preventive and supportive measures are available* (easily accessible condoms, referral services in place for clinical, social, and psychological care and support), and where the social environment is informed, educated, and fully supportive and sero-positive persons are not faced with severe psychological distress.

One of the strongest criticisms against C&T concerns their high cost. A randomized controlled trial is now in the planning stages by AIDSCAP to compare the efficacy of C&T, vs. counseling alone, vs. standard health education among STI clinic clients at three sites in the Africa region. Nevertheless, *further research and evaluation is still needed to provide information regarding efficacy, cost-effectiveness, and cost-benefits of HIV counseling and treatment* in inducing behavior change.

Strengthening Sexually Transmitted Infection Services

The strong correlation between STIs and HIV exists not only in the role played by STIs in HIV transmission. The predominant mode of transmission for STIs and HIV is sexual; many of the measures for preventing sexual transmission of STIs and HIV are the same, as are the target audiences for these interventions; and STI clinical services are important access points for diagnosis, treatment, and education of people at high risk of contracting STIs and HIV. Given these facts, public health professionals and donor agencies are increasingly recognizing the importance of strengthening STI services to encourage success of HIV/AIDS control efforts.

Increasing Access to STI Services

Vertical STI services require specialized expertise and equipment. Thus, they are less accessible operationally, geographically, and socially. To increase accessibility and to maximize availability of STI services, *STI services need to be integrated into existing primary health care services, antenatal/MCH clinics, family planning programs, and HIV/AIDS prevention and control programs.* (See Integrated Services.)

Increasing Use of Services

An understanding of the factors influencing use of STI services by clients is critical, because to control STIs, those affected must seek and obtain treatment, and those at high risk must seek preventive health care. A well-known fac-

tor is the role played by clients' knowledge, attitudes, and behavioral patterns in seeking health care services. Equally important is the need to understand provider behavior that can determine health-care seeking behavior.

Knowledge about the disease is essential to provide quality health care. For example, a study in the U.S. found that increased knowledge in health-care providers was related to increased willingness to provide care and to less harsh and judgmental attitudes toward patients with HIV or AIDS (Bailey et al. 1989). Lack of knowledge regarding transmission is associated with negative behaviors due to fear of contagion. Although studies exist concerning provider knowledge and attitudes, the majority focused specifically on HIV and AIDS, and few addressed the status of knowledge about STIs among providers. *Studies assessing factors affecting use of STI services are urgently needed. Also included should be an assessment of knowledge, attitudes, and beliefs regarding STIs among health providers and the consequences of provider attitudes on quality of health care and health-care seeking behavior.*

Increasing STI Prevention Activities

Condom promotion and distribution coupled with behavior modification through IEC activities should be a significant focus of STI prevention efforts. Interventions promoting behavior change should include: (1) counseling for risk reduction (reduced number of non-regular partners, avoidance of high-risk sexual practices); (2) promoting acceptability and correct, consistent use of condoms; (3) encouraging compliance with medical prescriptions; (4) emphasizing partner notification and referral for treatment; and (5) training care providers in symptom recognition, assessing risks, and changing attitudes. *Determination of the cost-effectiveness and cost-benefit of STI prevention interventions and the barriers to effective implementation should be a research priority.*

Screening for Early Detection of STIs

1. Syphilis Screening at Antenatal Clinics. Syphilis screening at antenatal clinics is officially recommended in most developing countries. However, this intervention is implemented very inconsistently, even in countries with a syphilis prevalence of more than 20 percent among pregnant women, due to low awareness of the problem among health care providers, the general population, and policy-makers; unavailability of diagnostic tests or penicillin; and low antenatal clinic attendance rates during early preg-

nancy. However, a project in Zambia showed that it is possible to implement syphilis screening and management into antenatal care, thus providing secondary prevention for syphilis during pregnancy and control of congenital syphilis. The women were also counseled to encourage their sexual partners to attend the clinic for early treatment. These services contributed to a decline in syphilis among pregnant women in Lusaka from 13 percent in 1983, the year before services were introduced, to 8 percent in 1987 (Hira et al. 1990). The cost of each prenatal screening in the Zambia study (with a population prevalence of 10 percent for syphilis) is U.S. $0.60 (including treatment, training, equipment, and health education material), with a cost of U.S. $12 for each case averted (Hira et al. 1990). Given the outcome of prenatal screening (preventing adverse outcomes of pregnancy due to syphilis), *establishment of syphilis screening at prenatal clinics in urban/high-density areas must be strongly considered by program planners. FP clinics are also existing access points to screen a broader community.* Syphilis sentinel surveillance data from prenatal and FP clinics will be useful indicators in monitoring and evaluating the screening activity.

2. Quick, Simple Diagnostics. The availability of quick, simple, inexpensive diagnostics is indispensable for successful screening activities. Recognizing this key program need, an international effort, the STI Diagnostics Initiative (funded primarily by USAID), was established in 1990, through a unique collaboration of donor agencies and health scientists, to identify or develop rapid, accurate diagnostics. Under the Initiative, the Program for Appropriate Technology for Health (PATH) is developing and testing a field culture test using dehydrated media to identify gonococcal cervicitis and oxidase strips to identify gonococcal urethritis. Field testing of the dehydrated media for gonococcal cervicitis is in progress in Mali, Senegal, and Malawi. The oxidase strip for gonococcal urethritis is being compared for cost-effectiveness against standard syndromic diagnosis. A serum separation card for RPR (rapid plasma reagin test for syphilis) test is also being field-tested in Mozambique and Kenya. *Evaluation of the cost-effectiveness of newly-developed field-appropriate diagnostics and dissemination of evaluation results is clearly a priority.*

3. Risk Assessment Protocols and Syndromic Algorithms. In the absence of diagnostics, risk assessment protocols and syndromic algorithms can be used. Risk assessment was used in Tanzania to screen women attending antenatal clinics. The Tanzania study based risk assessment on a number of

factors (age, number of partners in the last year, reported vaginal discharge, and discharge seen at time of examination), and assigned points to each factor. With a score of six or more points, the assessment was considered positive. Among 97 women in the Tanzania study, five STI cases were correctly detected by risk assessment. The results were counter-checked by laboratory tests, and laboratory testing found that seven of the 97 women indeed had chlamydia or gonorrhea (*Population Reports* 1993). Risk assessments may work well in some populations but not in others, and program planners may need to adapt risk assessment factors and scoring, based on specific situations, to improve its predictive value. *More information is needed on the cost-effectiveness and predictive value of syndromic algorithms and risk assessment protocols, compared with laboratory and clinical approaches.*

Improving Management of Cases to Limit Complications

In STI control, the term case management generally includes a spectrum of activities: **counseling, condom** promotion, **correct** treatment and compliance, and tracing and treating sexual **contacts** of STI patients.

1. Counseling. Counseling (face-to-face communication between health provider and client) should be a high priority in STI services, but in practice, STI providers often neglect counseling. For example, in a U.S. study involving 60 STI patients, one-quarter received no counseling/information about preventing STIs (*Population Reports* 1993). One of the major constraints cited by health care providers was lack of time. To counsel well and get the messages across may take as much as 15 to 20 minutes and few providers can spend that much time with each patient. Under such circumstances, it may be beneficial to have specially trained counselors talk to patients after they have seen a doctor or nurse. A study in Nigeria tested the effect of reinforcing a social worker's counseling with a doctor's counseling. All patients who received expanded counseling returned for their follow-up visit. Of those who did not receive the extra counseling, only three-quarters returned (*Population Reports* 1993). Research may be needed *to evaluate and validate existing counseling activities in STI clinic settings to identify barriers to counseling and parameters that have been associated with success or failure of counseling services and their impact on different audiences.*

2. Condom Promotion and Motivating Male Participation. Condom promotion in the mass media and social marketing programs have successfully increased condom use in a number of countries. Nevertheless, research is

still needed to promote domestic use of condoms and motivate male participation. Because condoms are so often linked with infidelity, many men and women hesitate to use them with a steady or permanent partner. To many, using condoms in a long-term relationship implies distrust of one's partner and suggesting condom use is harder for women, especially for married women. In sub-Saharan Africa, as in most emerging nations, women are fully dependent on their partners their economic well-being and for their status in society. They usually do not negotiate sexual behaviors and most would not dare ask their partners to use a condom. There is *a need to increase domestic condom promotion and motivate male participation to increase male involvement/use of barrier methods.* This will require: (1) increased emphasis on promoting a positive image of condom use; (2) developing culture-sensitive, appropriate condom negotiating skills (to be taught in counseling sessions); and (3) identifying innovative approaches to encourage and motivate greater participation by men to share responsibility for decisions and behavior.

3. Correct Treatment. Providing correct treatment based on correct diagnosis at the point of first encounter with the health system is the cornerstone of STI control.

i) Syndromic Treatment. The syndromic approach is not new and can be done by primary health care workers using step-by-step instructions provided in algorithms. The disadvantages of the syndromic approach are: (1) failure to diagnose and treat asymptomatic infections (as many as 50 percent of infected women have no symptoms); and (2) waste of drugs because providers may need to treat for several STIs (causing a particular syndrome) at the same time. *Evaluation/validation of syndrome management of STIs (especially for use in women) is critical.* Syndrome validation studies are already in progress by AIDSCAP project (in Tanzania, Malawi, and Mali) and more studies are planned. WHO is also planning to compare the cost-effectiveness of syndromic diagnosis with laboratory and clinical diagnosis.

ii) Mass Treatment. Mass treatment or empiric, periodic treatment was recommended as a high priority by the STI technical advisory group in 1993. In this approach, treatment is provided on a periodic basis to all members of a population in which repeated transmission occurs (whether a person shows symptoms or not). Mass treatment campaigns are rare, but not new. For example, between 1976 and 1977, a mass treatment campaign was implemented in the U.S., focusing on migrant farm

workers and prostitutes. The campaign resulted in a 27 percent decline in reported syphilis among the farm workers and a 51 percent decline among prostitutes from one year to the next (Jaffe et al. 1979). Several mass treatment protocols have been developed by the AIDSCAP project and are being discussed and reviewed together with potential in-country collaborators. Nevertheless, *further research and analysis is needed on the cost-effectiveness of mass treatment of core groups and to compare and evaluate selective mass treatment vs. total mass treatment.*

iii) Treatment by Private Providers. Private providers treat many people with STIs. These providers may be private clinics and pharmacies in the formal private sector, or they may be market vendors, street vendors, and traditional sources of medical care in the informal private sector. There is *a need to identify the various levels of private providers and mobilize and strengthen these resources to reinforce on-going STI activities.* For example, in Zimbabwe private practitioners receive publications of the essential drug program, including STI treatment guidelines. In Senegal pharmacists are studying STI management. In Tanzania workshops for pharmacists have emphasized STI treatment in accordance with national guidelines. And in Cameroon, in an innovative AIDSCAP project, staff from about 200 pharmacies are being trained to sell an STI treatment package containing antibiotics, informational brochures with general STI information, partner referral cards, and condoms with instructions. These packages will be sold in pharmacies without prescriptions and this approach to pre-packaged antibiotic therapy will be thoroughly evaluated using indicators such as consumer acceptance, user compliance, use of partner referral cards, etc.

4. Contact (Partner) Notification and Referral. STI control cannot be achieved merely by treating people presenting at health facilities with signs or symptoms. Partner notification is essential in which the partners of those who are identified and are being treated for an STI are traced, informed of their probable exposure to infection, and offered medical and counseling services.

Partner notification has long been one of the most important services managed by the Division of STI/HIV Prevention of the U.S. Centers for Disease Control and Prevention. For more than 30 years, CDC has been training disease intervention specialists (DIS) in partner notification and tracing contacts. In developing countries, however, partner notification is rarely implemented or emphasized in STI control programs because of socio-cul-

tural barriers concerning STIs and sex in general and because of a lack of health care providers trained in partner notification.

Partner notification may be accomplished by: (1) patient referral through direct referral of partners by infected individuals; (2) provider referral through the mediation of health care providers/workers trained to confidentially trace and notify the partner(s) based on information provided by the infected patient; and (3) patient and provider referral in which the provider asks for names and addresses of partners, but gives patients one week's time to refer them. If the patient's partners do not appear, providers attempt to contact them. Patient referral is the least expensive and the least effective approach: generally fewer than one-third of partners appear for treatment. Provider referral can bring up to three times as many partners for treatment, but concerns such as cost-effectiveness and the potential to invade privacy have frequently been voiced. The last approach, patient and provider referral, may deter people from seeking care. People may stay away from a clinic that requires patients to give the names and addresses of partners. Partner referral strategies remain incompletely evaluated, and *there is a need to evaluate and compare different partner referral strategies.* Partner referral is more important for women, because in the absence of routine screening for women, the only way to identify asymptomatic women may be through their male sexual partners. For gonorrhea and chlamydia specifically, partner notification can lead to treatment of asymptomatic infected female partners of men with proven infection, preventing complications in women such as pelvic inflammatory disease, infertility, or ectopic inflammation.

Improved Surveillance

Improved surveillance of STIs is needed to track trends over time as well as geographic trends. *More information is needed on the prevalence of different STIs (particularly in women and adolescents), as well as their antibiotic resistance patterns.*

Random or cluster sampling should be conducted not only in the high risk "core" population but in samples representative of the general population of sexually active men, women and adolescents (MCH clients, family planning clients, blood donors, health care providers). In women and adolescents, surveillance on incidence/prevalence of certain selected STIs can be conducted; this data will be useful in defining program directions and in

monitoring the effectiveness of program interventions. *Identification and development of the best methodologies to rapidly assess the overall current STI situation and thereby provide guidance for more targeted research and intervention priorities is a necessity.* (See also Program Monitoring and Evaluation.)

Additional research issues related to strengthening STI services:

- How can existing community-level STI services be reorganized and strengthened to treat and prevent classic STIs and prevent sexual transmission of HIV?
- What role do provider knowledge, attitudes, and practices play in use and quality of care in STI services?
- Determine the cost-effectiveness and cost-benefit of existing STI prevention interventions and the barriers to effective implementation.
- Evaluate the cost and impact of syphilis screening, treatment, and counseling of pregnant women attending antenatal clinics.
- Evaluate newly-developed diagnostic methods (feasibility, quality, costs, benefits) to improve STI diagnosis in field settings.
- What barriers exist to counseling in STI clinic settings? What parameters are associated with success or failure of STI counseling services? What is the impact of STI counseling on different audiences?
- What are the determinants (social norms, perception of condoms, barriers to use) for domestic use of condoms between regular partners? (Domestic condom promotion may be especially effective in situations where women may be at increased risk for STIs because of the sexual behavior of their regular partners.)
- What are the most effective strategies to increase male use of barrier methods?
- How do diagnosis and treatment of STIs using syndromic algorithms and risk assessment protocols compare with laboratory and

clinical approaches, particularly for female patients, in terms of acceptability and cost-effectiveness?

- Mass treatment of core groups: Are these approaches cost-effective? Should mass treatment be given when rates of ulcerative STIs exceed a certain level of prevalence (e.g., 50 percent of antenatal clinic attendees with gonorrhea)? Compare selective mass treatment vs. total mass treatment.

- What are the best methodologies to rapidly assess the overall current STI situation and thereby provide guidance for more targeted research and intervention priorities?

Program Monitoring and Evaluation

Program monitoring and evaluation are an integral part of program delivery and essential to building appropriate modifications into ongoing programs and determining whether programs achieve their objectives. Monitoring and evaluation both require information to link program interventions with program outcome. Monitoring accepts the program design as given, and may rely on data from management information systems or surveillance activities. Evaluation, on the other hand, provides information and status of progress toward achievement of objectives and is fortified by the existence of strong monitoring systems. Moreover, evaluation provides information about the program's future direction—for example, expansion or modification of interventions. Evaluation may also examine cross-cutting issues such as comparative cost-effectiveness of different interventions with the same objective, effectiveness of vertical vs. integrated services, for example. In addition to impact assessments and economic analyses (discussed under Policy Research above), a number of tools exist to monitor and evaluate programs.

Surveillance Systems

Surveillance of HIV/AIDS is critical to track the epidemic's trends over time and geographic trends and to monitor the magnitude. The HIV/AIDS Surveillance Database, initiated and funded by USAID through the International Programs Center of the U.S. Bureau of the Census, is a model of efficient surveillance. The database tracks international data on HIV infection rates and AIDS cases from all published and unpublished reports, surveys, and all available data sources. It has been used extensively to

design technical assistance projects. It has also provided important epidemiologic information that has been used to indicate priorities for resource allocation in HIV/AIDS programs in Africa. A similar database is being developed by the Bureau of the Census for STIs.

Surveillance should be a high priority not only because of lack of data but also because surveillance can serve as a powerful tool to: a) bring health planners' and decision makers' attention to the devastating effects of HIV/AIDS, STIs, and tuberculosis on the stability and productivity of households, communities, and businesses; b) identify specific control targets (core group or the general public); and c) identify and establish specific interventions. It is also important that information from surveillance be used effectively. *Too often, information is collected laboriously, but is not analysed or used for decision-making processes.* "Reasons for this presumably include the lack of expertise in data analysis and information systems as well as a lack of epidemiological skills" (Ronald and Aral 1992). To overcome this, professionals need to be recruited and trained in epidemiological skills. One such training program is the Centers for Disease Control and Prevention (CDC) Global Epidemic Intelligence Training Program, which recruits and trains developing country health ministry physicians in epidemiology. *Support of in-country training for field-oriented and clinically based epidemiologists is a high priority.*

There is also a need to further expand and improve existing national surveillance systems. For example, more information is needed about the *incidence of STIs and HIV/AIDS among women in the general population as well as their antibiotic resistance patterns.* Clinical and epidemiological predictors of STIs in women must be refined to develop better management algorithms for symptomatic and asymptomatic infection. Information about the *incidence of STIs and HIV/AIDS in adolescents* should also be a high priority. Monitoring of tuberculosis drug resistance in HIV-infected patients should not be overlooked either. It is not known how much of an impact HIV infection is having on the development and propagation of multi-drug-resistant tuberculosis in sub-Saharan Africa. *Systemic drug resistance surveillance in HIV-infected TB patients* will need to be instituted in national surveillance systems to monitor this problem.

Management Information Systems

Management information systems (MIS) are an integral component of the monitoring and evaluation process and are designed to facilitate information flow. All successful programs need to have timely flows of information—upward to aid program managers in planning, operation, evaluation, supervision, and management and downward to staff and clients for feedback. Recognizing the lack of well-developed monitoring and information systems in developing countries, WHO/GPA developed a basic management information system prototype that would be flexible enough to be adapted to a variety of countries and regions. The MIS prototype covers four areas—planning and monitoring, logistics systems for condoms and HIV test kits, financial accounting and reporting, and reporting on priority indicators of program implementation and effectiveness—and all information from the MIS will be incorporated into the main computer system at GPA headquarters. The software developed is being field-tested, prior to provision to national AIDS programs.

The AIDSCAP Management Information System is another example. The AIDSCAP MIS facilitates the flow of information within the AIDSCAP project and functions as a central point for coordinating evaluation data collected by subprojects and for country evaluation. The MIS is linked to AIDSCAP regional offices and their computer facilities, and provides country offices with fast feedback and inter-region comparisons.

MISs are extremely effective management and monitoring tools and ***developing and/or strengthening management information systems in all countries lacking an adequate national MIS should be a high priority.***

Priority Prevention Indicators (PPIs)

A collaborative effort by USAID, WHO/GPA, and CDC has resulted in development of priority prevention indicators (PPIs), a set of core indicators for countries to include in their national MIS and report on to WHO through a global MIS. This minimum set of indicators was developed to provide a standardized protocol for program monitoring and evaluation that will allow cross-national comparisons. The PPIs include process and outcome measures. They were selected for their usefulness for program monitoring, relative ease of measurement, and quantifiability. While the PPIs will enable cross-national comparisons, they are not intended to provide all the information necessary to monitor program activities and mea-

sure impact of specific components (subprojects) of individual country programs. However, they can be used as guides to develop larger sets of specific country and subproject indicators.

The five major areas covered by the FPIs are: (1) knowledge of preventive practices; (2) sexual behavior (reported non-regular sex partners, reported condom use in most recent risk relationship); (3) incidence and clinical and preventive case management of STIs (self-reported STI incidence in men, STI clinic clients assessed and treated according to national guidelines, STI clinic clients who received condoms and instructions in their use in addition to treatment, STI clinic clients who received counseling in partner notification and partner treatment); (4) condom availability (condom availability at central level and condom accessibility at peripheral level); (5) STI/HIV prevalence in women (syphilis sero-prevalence and HIV sero-prevalence in women 15 to 24 presenting at antenatal clinics). The major data collection methods adopted to measure the priority prevention indicators will be population/community surveys, health facility surveys, condom outlet records reviews and assessments, and cross-sectional sero-surveys conducted in antenatal clinics.

Evaluation/validation of the PPIs will be critical to confirm the reliability and validity of the measurement techniques and their acceptability to the community. The cost of data collection should be monitored as well.

Other Indicators

In addition to the core prevention indicators, countries will need to select other process and outcome prevention indicators specific to their programs. Some examples include process and outcome indicators to monitor STI case management, STI facility management, indicators for HIV prevention in the workplace, indicators for HIV counseling and testing and indicators for capacity building or institutional development. To assist in the selection of specific national indicators, AIDSCAP has developed "AIDSCAP Evaluation Tools." Nevertheless, *further research is needed to identify and develop additional country-specific prevention indicators and measurement methods to get reliable and valid data for program monitoring and evaluation, as well as indicators and measurement methods in care and alleviation of the pandemic's socio-economic impact.*

Additional research issues:

- What is the magnitude of the HIV/AIDS epidemic in Africa?
- How can better surveillance systems be established: (1) to monitor the prevalence of STIs and their microbial spectrum and to track STI-related trends in the general population, particularly in adolescents and women; (2) to monitor the prevalence of HIV infection and to track HIV-related trends in the general population; and (3) to monitor systemic drug resistance in HIV-infected TB patients?
- How can management information systems be strengthened to effectively assist program managers in planning, operation, evaluation, supervision, management, and decision-making processes?
- What are the best measures of HIV/AIDS program impact in Africa? Validate priority prevention indicators for: (a) reliability and validity of measurement techniques; (b) acceptability to the community; and (3) cost of data collection.
- Identify and develop country-specific prevention indicators and measurement methods to assist in program monitoring and evaluation.
- Identify and develop indicators and measurement methods in care and alleviation of the pandemic's socio-economic impact.

Focusing on Adolescents

The increasing incidence of AIDS among youth lends urgency to the need for effective HIV prevention programs focusing on adolescents. WHO estimates that half of those infected with HIV are under the age of 25, and about one-fifth of people with AIDS are in their twenties—a large proportion of whom became infected in their teens (WHO/GPA 1991 Progress Report). AIDS education programs for young adolescents have been controversial. When should they start? How explicit should they be? Some believe that teaching adolescents about family life/sexuality and condoms will promote promiscuity. A number of studies show that it is not so, however. In fact, one plenary presentation at the IXth Berlin Conference on AIDS held in June 1993 overwhelmingly refuted the notion that early sexu-

ality education leads to increased promiscuity. Sexuality education programs for young people need to make safer behavior attractive. Skills training—such as teaching girls to say no—is also very important. Skills training must focus on approaches that allow a young adolescent to practice ways to say no *before* an uncomfortable situation arises.

HIV/AIDS prevention programs have targeted two categories of young people—in-school and out-of-school—through school-based, peer education, and outreach programs. Some school-based programs use specially developed HIV/AIDS curricula with accompanying teaching materials. For example, an educational kit developed in Uganda with support from UNICEF was so successful that it has been adapted for other African countries (*Population Reports* 1990). In peer education programs, many approaches have been used: youth teach youth through anti-AIDS clubs, through theater, and in some Caribbean countries, debates by youth on HIV/AIDS in parliamentary chambers are nationally televised. For out-of-school youth, outreach communication strategies through peer education, media, and theater are being tried.

It has been noted that the most common goal of HIV prevention programs targeting youth is raising awareness; and the least common is peer support, which is among the most effective approaches to raising awareness, initiating behavior change, and providing support to help practice safer behavior. A study to develop and evaluate a peer and community mobilizing approach to educate and promote safer sexual practices among out-of-school youth is underway in Jamaica. This study, a collaborative effort of AIDSCAP, the Center for AIDS Prevention Studies (CAPS) of the University of California, San Francisco, and the Jamaican Ministry of Health, provides insights into ways to generate peer-supported behavioral and social change among high-risk, out-of-school youth. And in Botswana, WHO/GPA in collaboration with the Young Women's Christian Association (YWCA) is supporting the design and evaluation of a project using 110 trained peer educators to reach approximately 5,000 13 to 19-year-olds in secondary schools. This project examines the effectiveness, sustainability, and potential reach of peer education in youth. Approximately 60 percent of the developing countries surveyed by *AIDS in the World* (Mann, Tarantola and Netter 1992) reported in- and out-of-school programs, but in most programs, activities are undertaken without an evaluation component. For example, anti-AIDS clubs organized by adults for youth are becoming quite widespread in anglophone Africa. While these clubs have been very suc-

cessful in attracting large numbers of adolescents, to date their effectiveness has not been evaluated. There is *a need to compare and evaluate the effectiveness of different health promotion strategies targeted at youth and adolescents in educational settings as well as those out-of-school. The effectiveness of school-based approaches to reduce the incidence of adolescent STIs needs to be assessed as well.* A major constraint of school-based approaches has been that teacher training—which is crucial to promote effective learning—has been insufficient or inappropriate in AIDS education.

Equally important is *research on adolescent sexuality and sexual behavior and condom use.* Awareness of HIV among adolescents is generally high, but personal perception of risk is usually low. Research has shown that low risk perception among adolescents has been associated with higher-risk activities (Koopman et al. 1990). Furthermore, there is also a negative attitude among youth toward condoms (Baffi et al. 1989).

More *information is also needed about the predominant norms and values and the socio-economic and behavioral determinants influencing the issue of adolescents providing sexual favors to older people* in return for financial support.

Additional research issues:

- Which strategies are the most effective in reaching youth in educational settings and out-of-school youth?
- Assess and evaluate on-going school-based approaches. Are school-based approaches effective in reducing incidence of adolescent STIs?
- What mechanisms and patterns (educational, socio-cultural, religious, financial) determine adolescents' role as recipients of infection? What are the implications of these mechanisms for HIV/AIDS intervention and control?
- What predominant norms and values and socio-economic and behavioral determinants influence sexual decisions, risk perceptions, sexual practices, and health-seeking behaviors in adolescents?

Implementation of Research, Analysis, and Information Dissemination Activities

USAID is uniquely qualified to conduct research, analysis, and information dissemination activities related to the development of effective HIV/AIDS prevention and control programs and to support policy formulation. The umbrella project of USAID's HIV/AIDS prevention strategy, the AIDS Control and Prevention (AIDSCAP) project, has more than 85 AIDSCAP subprojects underway worldwide, of which 30 are in Africa. AIDSCAP, in collaboration with USAID field missions, works with local governments, NGOs, the private sector, and community groups. The more recently developed Health and Human Resources Analysis for Africa (HHRAA) project supports research, analysis, and information dissemination on regional issues of highest priority. A number of USAID cooperating agencies (Tulane University of Public Health, the Academy for Educational Development to name a few) have access to networks of African institutions, researchers, and program managers who are already very active in HIV/AIDS-related activities. USAID also plays a key role in working with other U.S. government agencies, such as the Department of Health and Human Services, the Centers for Disease Control and Prevention, the National Institutes of Health, and the U.S. Bureau of the Census, involved in HIV/AIDS prevention and control activities.

Thus, USAID Africa Bureau's comparative advantage lies in its capacity to do research, analysis, and information dissemination and provide technical, intervention-oriented assistance through activities implemented by its cooperating agencies (CAs) and African institutions affiliated to the CAs; by projects such as AIDSCAP and HHRAA; by USAID's interagency support with other U.S. government agencies; and by its coordination with multinational organizations, such as WHO, The World Bank, and the African Development Bank. Because of the complementary roles played by multilateral and bilateral programs, USAID will now provide support to UN agencies involved in HIV/AIDS prevention as well as directly to selected emphasis countries.

Presence of USAID Missions with full-time technical PHN staff in the field also makes USAID well-informed and well-connected at the field level. In addition, field presence of USAID Missions provides adaptability to design interventions and research that meet local needs and to change them as circumstances dictate.

USAID's long experience in institution building with private voluntary organizations (PVOs), non-governmental organizations (NGOs), and universities providing technical assistance and training is another area in which the Agency has comparative advantage. USAID's strong private sector emphasis also gives the Agency an advantage over other organizations: for example, USAID pioneered the private sector AIDS-in-the workplace approach to HIV/AIDS prevention. The very successful condom social marketing program in Zaire is another example of USAID's strong private sector emphasis.

Through consultative meetings, through regional meetings, conferences, field inputs will be sought from decision makers and health planners in Africa to refine the framework. And based on new information, recommendations, and demand from the field, the strategic framework will be revised as necessary.

The strategic framework will be used as background and reference from which AFR/ARTS/ HHR will select and draft an analytic agenda for research, analysis, and information dissemination. The agenda will include research, analysis, and information dissemination activities from a selected analytic area; a preliminary timetable; a rough budget; and identification of potential resources for carrying out the activities. Once an ARTS/HHR agenda is set for an analytic area, research proposals will be sought to address and implement the specific analytic agenda activity. Each proposal for an agenda activity should have a monitoring and evaluation plan with clearly selected process and impact indicators to monitor progress and assess impact. Each research and analysis finding will be disseminated in a variety of ways to ensure maximum exposure.

Annex: Other Research and Information Needs

Although not prioritized by USAID field staff who participated in the Marrakech workshop, the following is a discussion of available information on other analytic areas and related research and information needs regarded as equally critical (based on USAID's HIV/AIDS strategy focus, relevant literature reviews; and priorities identified by international expert bodies) for the effectiveness of existing HIV/AIDS and STI prevention and control programs.

Increasing Demand for, Access to, and Use of Condoms

The AIDS epidemic ushered in a new era of condom promotion. Strong evidence exists that condom use protects against HIV infection. The more consistently condoms are used, the more protection they provide. In a Kenyan study none of the prostitutes who used condoms consistently was infected, compared with 56 percent of those using condoms less than half of the time and 72 percent of non-users (Ngugi et al. 1988). A study in Zaire followed the sexual partners of 144 people with HIV infection for an average of six months. Among the 85 percent who used condoms regularly, only one partner became infected. In contrast, three of the 15 percent who did not use condoms regularly became infected (Kamenga et al. 1989). And data from the University Teaching Hospital in Lusaka, Zambia (unpublished), showed an HIV-infection rate of 3.5 per 100 couple-years among couples who reported using condoms every time they had intercourse; among less consistent condom users, the infection rate was 10.1 per 100.

Experience has shown that informed people do choose to limit risky behaviors and aggressive condom promotion. This, combined with information and education to reinforce prevention messages, can increase condom use. Condom social marketing programs have emerged as an approach to HIV/AIDS prevention that holds great promise. For years, social marketing programs have helped make condoms a major family planning method. Such programs operate in about 40 developing countries and sell more than 500 million condoms a year. Today social marketing programs are focusing not only on family planning but also on AIDS, and some new programs are specifically aimed at AIDS. These programs are placing their sales outlets where high-risk people are concentrated: red-light districts, military installations, universities, colleges, seaports, bus and train stations, truck stops,

and stopovers along major transportation roads. Such programs increase the acceptability of and access to condoms at affordable prices through existing outlets and distribution systems, using communication and marketing skills and techniques. Because significant levels of demand can be created very rapidly through promotion campaigns and social marketing efforts, the challenge ahead lies in increasing condom accessibility and availability, and ensuring sustainable condom supply mechanisms. Thus, programs will need to identify ways to increase accessibility to condoms, decrease condom costs, and design sustainable condom programs.

Increasing accessibility by distribution through new channels

As the demand increases, the number and types of distribution outlets will have to grow to reach more users. Several efforts have already begun to identify new channels, including public-private sector partnerships for marketing and provision of condoms. In addition to social marketing, new channels for condom distribution might include new outlets (e.g., through food store chains and discount mass merchandise stores in Mexico); community-based distribution (CBD) programs (e.g., a project in Nairobi, Kenya, found that community health education meetings and condom distribution by community health workers helped to increase condom use among commercial sex workers who did not attend STI clinics); workplace distribution programs (e.g., the Ugandan Workplace project conducted by the Federation of Ugandan Employers, which distributes condoms at work sites of major employers throughout the country); and distribution through existing family planning programs.

Decreasing Costs

Costs can be decreased by policy reform as well as by manufacturing locally. Policy changes such as lowering licensing fees, taxes, and import duties on condoms can help decrease condom costs. Condom prices are high in most developing countries because condoms are imported and are subjected to import duties, taxes, and licensing fees, which can increase the price by 35 to 100 percent (Kitchener 1990). The cost in revenue to the government would be a small price to pay for more condom sales and the resulting health benefits. Recognizing this, Mexico reduced import duties

on condoms from 45 to 25 percent in 1988, to 15 percent in 1989, and to 10 percent by 1991, thus encouraging commercial distribution of condoms (*Population Reports* 1990). This was positively reflected in the retail purchase price for condoms in Mexico compared with other selected countries in the same region: $28 per 100 condoms in Mexico compared with $79 in Venezuela and $70 in Brazil (World Bank 1993). The support of government and policy makers is vital. Programs will need to identify ways to achieve policy reform where required. They may need to use data and research findings and develop modeling and projection tools to graphically portray the implications of AIDS to prioritize policy options.

Manufacturing Locally

Manufacturing locally can also decrease costs. Producing condoms in developing countries can be less expensive than producing them in developed countries because of lower labor costs. Currently, however, few developing countries meet the market and structural conditions for establishing condom industries and still fewer would be able to produce reliable products. On the contrary, testing and packaging condoms require much less capital investment than condom production. In Mexico, Grupo Profam, a private social marketing agency, has been testing and packaging bulk condoms imported from the U.S. since the early 1980s. Grupo Profam pays about U.S. $.03 apiece for tested condoms and about $.024 cents for untested condoms that it then tests and packages. The final cost to Grupo Profam is less than the production costs of the U.S. manufacturers (De La Macorra 1990; PATH 1990). Based on specific country settings, studies will be required for programs to determine how much emphasis should be placed on local production compared with other approaches such as policy reform through lowering barriers to imports.

Research issues to be addressed:

- What mix of distribution channels (private and public) will effectively increase access to condoms?
- Can policy changes such as lowering taxes, licensing fees, and import duties be pursued to lower the costs of condoms? Is condom

production in Africa economically and politically feasible? How much emphasis should be placed on local condom production vs. other approaches such as policy changes?

- How sustainable are the condom social marketing programs in sub-Saharan Africa?

- Evaluate condom supply operations from estimating needs to managing supplies and monitoring condom quality in the field. Recommendations and lessons learned from the evaluation can be used to strengthen and improve condom programs.

Targeting

Interventions targeting core groups are likely to be particularly cost-effective because they may have an amplifying effect. In a 1990 study, after it was estimated that one female commercial sex worker (CSW) with HIV infection was the source of 12 cases of HIV infection in the general population, a targeted STI prevention program was implemented in a Nairobi CSW population. The program demonstrated that targeted STI diagnosis and treatment in combination with condom promotion reduced the mean annual incidence of gonorrhea from 2.85 cases per CSW in 1986 to 0.66 cases per CSW in 1989 and markedly reduced the incidence of other STIs including HIV infection. Through targeting, it was estimated that the program prevented 6,000 to 10,000 new cases of HIV infection, at a cost of approximately U.S. $8 to U.S. $12 per HIV infection averted (Moses et al. 1991).

The emphasis and approach of STI and HIV/AIDS control and prevention programs need to vary according to the population at greatest risk. Where funding is very limited, programs have been targeted at "core groups." It has been documented that control programs targeted at core groups are the most cost-effective and will ultimately have the highest impact on public health—for example, an intervention in the core group will have ten times the effect or more, than one implemented in a non-core group (World Bank 1993). Core groups are defined as groups of people who are disproportionately responsible for disease transmission in the population. They are the reservoir for many STIs and their frequent change of partners permits STI pathogens to persist in a community or to increase rapidly. They usually include commercial sex workers (CSWs), clients of CSWs, and

those in society who are likely to have multiple sexual partners such as migrant laborers, truck drivers, and members of the military. Most programs for high-risk populations currently focus on CSWs. A 1991 WHO/GPA review of prevention programs focusing on high-risk populations in 38 developing countries found that 50 of the 83 HIV/AIDS prevention programs reviewed worked exclusively with CSWs. 28 worked with both CSWs and clients or with clients alone, mainly truck drivers and the military. But as the prevalence of STIs and HIV/AIDS in the general population increases, the wisdom of depending primarily on interventions targeted exclusively at core groups leaving transmission in the general population unaddressed becomes questionable. For instance, those in the population who are not targeted may perceive themselves as "safe," although they may be at increased risk because of high-risk behavior.

The ideal situation would be to have adequate resources to develop prevention and control programs to meet the needs of all population groups, however, this is not yet possible. It is crucial to balance prevention and control efforts so that all resources are not targeted exclusively at "core groups" perceived to be at high risk. Thus, there is a need for information on the impact and cost-effectiveness of interventions targeting "core groups" vs. interventions implemented for non-core groups, to assist health planners and program managers in selecting interventions for HIV/AIDS control and prevention programs.

Research issues to be addressed:

- How can we identify target groups? What are the criteria for selecting and prioritizing target groups, especially in areas with low but increasing incidence of HIV infection?
- What are the social and cultural consequences of targeting?
- How can programs best access target groups? Do program targets reflect the perceived needs of the community?
- Based on existing and on-going studies and relevant literature, analyze and disseminate information on the impact and cost-effectiveness of interventions targeting core groups vs. interventions implemented for non-core groups.

Women and HIV/AIDS

In many parts of Africa the incidence of HIV/AIDS in women is increasing at a faster rate than in men. A study in Zaire found four times more infection in women in the 15 to 30 age group, than in men in the same age group (Panos Institute 1989). Studies in Ethiopia and Zimbabwe also revealed dramatic differences in the sex distribution of AIDS, particularly in adolescents aged 15 to 19: the studies showed that adolescent girls are three to five times more likely to be infected than males in the same age group (Werk-Zewdie 1993).

The implications of these data are that women in general and younger women in particular are susceptible to infection. Women are biologically more vulnerable to HIV and other STIs than men. Furthermore, in most societies there is a significant power differential between men and women, in society at large and within the family. The social status of women in a society and the predominant gender power relations influence women's vulnerability to HIV/AIDS and STIs in important ways. In societies where a woman's status is defined only in terms of her relationships to men--wife, mother—women tend to be less educated and economically and socially dependent on men, they lack power in interpersonal relationships, and they are at increased risk for HIV/AIDS because of the sexual behavior of their partners. Thus, **the importance of gender/age specific issues should be recognized and initiatives to adjust gender power relations need to be incorporated** into HIV/AIDS policies and programs.

In this context, raising women's status is increasingly being recognized as an essential strategy, if programs for HIV/AIDS are to be effective. Raising women's status would involve focusing on women's education and vocational training to enhance women's economic independence. It would also entail reducing women's economic dependence through measures such as increased labor force participation and access to income, land, and credit. With funding from USAID, the International Center for Research on Women (ICRW) is conducting a research program that supports 17 projects throughout the developing world. The studies from this program have highlighted opportunities for educating and empowering women through support and discussion groups and by using powerful women as sources of influence in communities. Empowerment strategies already proven effective will need to be identified, assessed, and applied in the

context of HIV/AIDS and further research on strategies to raise women's status and promote empowerment of women should be a high priority.

To date, the focus of research has primarily been on (1) commercial sex workers and transmission from them to their male partners, and (2) pregnant women and transmission from them to their offspring. Because women already carry a heavy work load, in the work force and in the home as wives, mothers, and care-givers caring for the sick, elderly, and orphans, women appear to be disproportionately affected by the burden that HIV/AIDS imposes on the communities. The second decade of HIV/AIDS research work needs to shift focus from the concept of women as transmitters of infection. More information on HIV/AIDS reproductive age women in the general population, their susceptibility to infection, and the means that would enable them to protect themselves is needed. A thorough knowledge of the many dominant and subordinate social and behavioral mechanisms and patterns (educational, socio-cultural, religious, financial, role in sexual negotiation, women's reluctance to inhibit childbearing as a resistance to condom use, etc.) that determine women's role as recipients of infection and their implications is fundamental if effective interventions for the support and empowerment of women are to be developed. Research is also required to gain a clearer understanding of the social and economic needs of women infected and affected by the HIV/AIDS epidemic.

Research to identify or develop prevention technologies specifically adapted for use in developing countries is equally important. For example, technology research to develop female-controlled preventive technology must continue to be a high priority. The female condom, "Reality," is already on the market, but simpler, less expensive female condoms are needed. It should also be recognized that female condoms are most likely to reach and be used only by those women who are already in a position to control their sexual relations and, therefore, most probably already in a position to insist that their partners use condoms. Research is also being carried out to assess the safety of vaginal virucides with anti-HIV activity. If successful, these microbicides would be a major breakthrough because they would allow women to protect themselves from HIV infection by applying a vaginal cream or jelly. Studies to assess the acceptability and effectiveness of female-controlled barrier methods and identify approaches to make the barrier methods more easily available and accessible are crucial.

Research issues to be addressed:

- What factors need to be addressed to adjust gender power relations and raise women's status?
- What can be learned from existing models of empowerment of women that could increase women's capacity to protect themselves from STIs and HIV/AIDS? Identify and assess the empowerment strategies already proven effective.
- What mechanisms and patterns (educational, socio-cultural, religious, financial, role in sexual negotiation, women's reluctance to inhibit childbearing as a resistance to condom use, etc.) influence women's role as recipients of infection? What are the implications of these mechanisms for HIV/AIDS intervention and control?
- What social and economic support is most needed to enable women to cope with the HIV/AIDS pandemic?
- Assess the acceptability, use, and effectiveness of barrier methods under female control (e.g., female condoms and vaginal microbicides). Identify approaches to make the female condom more available and accessible.

Providing a Safe Blood Supply

Studies have shown that early treatment of conditions that predispose individuals to severe anemia and educating health care providers about the risks of blood transfusions and establishing guidelines for transfusions can reduce transfusions by more than 50 percent (World Bank 1993). In addition, because paid blood donors tend to have a higher risk of HIV, donor payment should be eliminated where possible. For example, in Mexico a significant number of cases due to blood transfusion were noted, compared with other subregions in Latin America. However, with the implementation of legal measures prohibiting payment of blood donors, cases associated with blood transfusion have declined significantly (PAHO 1992 AIDS/HIV/STD Annual Surveillance Report).

But when transfusions are absolutely necessary, it is imperative to provide a screened, safe blood supply. Proven technologies exist for screening blood

but they are not rapid, are costly, and require a large number of blood samples to justify the expense of the equipment and required training. In areas where blood banks and laboratories exist, screening blood donors adds only about 5 percent to the overall cost of transfused blood (World Bank 1993). But in parts of the developing world where no blood banks exist, transfusions are often done on an emergency basis directly from donor to recipient. In such circumstances, rapid test strategies for HIV are urgently needed. An example is the HIV dipstick developed by the Program for Appropriate Technology for Health. The dipstick test takes 20 minutes, requires only three simple steps, has a similar sensitivity and specificity to commercially available tests, and costs less than U.S. $0.40 (World Bank 1993). WHO/GPA-supported-research is also continuing into the technical feasibility and cost-effectiveness of testing batches of pooled blood specimen. If the analysis of pooled samples is as sensitive as the testing of single samples, this technique of blood-pooling will provide a cost-effective way of screening blood and will lessen the strain on limited laboratory resources. However, cost-effectiveness very much depends on the HIV prevalence in a population: if prevalence is high, the cost-effectiveness analysis may prove that screening is still warranted.

There are a number of WHO/GPA studies and reviews related to the prevention of HIV transmission through blood or blood products, but none focused on blood screening programs. Since prevention is the cornerstone of USAID's HIV/AIDS program, if prevention of HIV through blood transmission is to be achieved, routine screening of donated blood should be implemented more widely. Thus, more information on blood screening programs, such as constraints faced by the programs, the sustainability of screening programs, and the cost-effectiveness of blood screening compared with other preventive interventions will be important.

Research issues to be addressed:

- **What constraints are faced by blood screening programs in Africa? How sustainable are the existing screening programs?**
- **How cost-effective is blood screening compared with other modes of preventive interventions?**

Health Care and Support

Humane and dignified care of AIDS patients is expensive. Such patients are even now using resources formerly used to treat other important diseases, some of which already have cost-effective treatment profiles. The harsh reality is that antivirals or antibiotic therapies for AIDS-related opportunistic infections are not going to be available soon in developing countries. Nevertheless, these conditions can no longer be ignored and rational plans and protocols need to be identified and developed to provide health care and support to AIDS patients so that the rising burden of HIV-related illnesses does not displace the treatment of other diseases with cost-effective profiles. Research will be essential to assess the needs and managerial capacity of health care systems to provide services to deal with the influx of HIV/AIDS-related cases without compromising other diseases with proven cost-effective profiles.

At the community level, a feasible solution is home and community-based programs formed and supported by neighborhood associations, women's groups, professional associations, unions, religious groups—some with more outreach, some with stronger links to hospitals, some from the public sector, some delivered by NGOs—people from all sectors of the community, from all walks of life, sharing the responsibility and the burden of care.

These home and community-based programs are critical if developing countries are to afford care and support not only for those with AIDS but also for the orphans and elderly left behind. There is no standard model for home and community care. Different models of care will be needed for different societies and communities. However, the basic idea is to provide services—basic medical and nursing care, counseling, and material support—to HIV-infected persons, people with AIDS, and their families through home visits. For example, in Uganda The AIDS Support Organization (TASO), formed by community volunteers, has helped many Ugandans to live positively through counseling, information, care, and other assistance. Trained TASO counselors (many of whom are HIV-positive) visit clients at home or meet them at TASO's day center for counseling and support. Basic medication is also provided free to clients as are material assistance such as milk powder and eggs. Also in Uganda another community-based program developed by a voluntary Christian group, Meeting Point, formed a self-help group for families and friends with HIV infection

or AIDS. This group offers home visits and care to anybody in need in the community. In Rwanda, under the Rwanda Red Cross Home Care Project, Red Cross volunteers have found a new role: teaching families in their own communities how to care for people with AIDS. No formal studies have been reported on these programs, however, and much remains to be learned about the different models of home and community care, factors complementing and enhancing community response capacities, the impact and costs of different strategies, and their replicability as well as their expandibility.

Research issues to be addressed:

- How can existing health systems be strengthened (human resource training, improving decision-making and management, improving the pharmaceutical system and logistics, etc.) to enable them to provide relevant services to deal with the influx of HIV/AIDS-related-illnesses without compromising other diseases with existing cost-effective profiles?

- What different models of home and community care programs exist to address care and support for AIDS patients and AIDS orphans? What is the impact and cost of such programs?

- How can the success of well-conceived, small-scale home care programs and community-based programs be expanded?

- What effective strategies exist for coping with or addressing the increasing number of orphans due to AIDS?

- What factors enhance adaptive community response capacities?

Addressing Tuberculosis

Trends in case notification from sub-Saharan Africa are sufficiently consistent to indicate that a tuberculosis epidemic is growing alongside the HIV/AIDS pandemic. For example, in Tanzania, although an effective tuberculosis control program had successfully reduced the incidence of tuberculosis prior to the HIV epidemic, the spread of HIV since 1983 brought a significant increase in tuberculosis incidence. By 1989, it was estimated that the number of new cases of tuberculosis in Tanzania was twice the

number that would have occurred in the absence of HIV (Pallangyo and Laing 1990).

Worldwide, one in every three people is infected with the TB bacterium, and in people harboring the bacterium, HIV infection is a strong risk factor for reactivation of subclinical tuberculosis infection and the development of active, clinical disease. Currently, an estimated four to five million people are co-infected with HIV and TB, with 80 percent of them living in Africa (De Cock 1993). It is also estimated that about half of all dually infected people will develop active, clinical tuberculosis and be capable of spreading the disease to any susceptible individual in the community (World Health Organization 1993).

Research is needed in many areas—epidemiology, diagnosis, treatment, and prevention—and a number of studies are already underway. However, the public health implications of combined TB/HIV infection are so serious that research in the following specific areas will deserve priority attention in countries where both are endemic.

Early diagnosis of tuberculosis in HIV-infected persons presenting at health facilities

Diagnosis of tuberculosis is more difficult in HIV-infected patients because of decreases in smear positivity, atypical X-rays, and increased false positive X-rays. Early and correct diagnosis of tuberculosis in HIV-infected persons is essential because people infected with HIV have a six to thirty times greater risk of developing active, clinical tuberculosis compared with people who are not HIV-infected. Methods of diagnosing tuberculosis must be substantially improved. For example, one study in Malawi to evaluate the usefulness and cost-effectiveness of initial screening of suspect cases by miniature radiography has been proposed by WHO. Nevertheless, more studies to assess and improve the sensitivity and specificity of diagnostic methods in field settings will be needed to reduce delays in treatment initiation and, accordingly, prevent spread of disease to the general population.

HIV counseling and testing of patients with tuberculosis

Little is yet known about the cost and impact of HIV counseling and testing of patients with tuberculosis. Studies to assess the cost and the impact of counseling and testing specifically on the post-test use of tuberculosis ser-

vices, care provided, treatment outcome, and patient compliance, as well as the ethical ramifications of testing should be considered.

Preventive chemotherapy for tuberculosis

Studies to assess the efficacy and identify the most efficacious drug combinations have been and are being conducted. For example, a study at a voluntary HIV testing site in Uganda, assesses the feasibility of six months of isoniazid preventive therapy among dually infected persons. Preliminary results recorded no adverse reactions and no cases of tuberculosis have developed among those on preventive therapy. In Kenya, a double-blind study is in preparation to assess the efficacy of isoniazid preventive therapy in a cohort of HIV seropositive women being followed in Nairobi. In Zambia, where six months of isoniazid or placebo was given to HIV-infected patients without prior tuberculin testing, preliminary data show a reduction of the subsequent tuberculosis risk by almost 90 percent, although no reduction in mortality was observed in the study (World Health Organization 1992). Preventive chemotherapy for tuberculosis may be the only means available to reduce the risk of clinical tuberculosis in the individual with dual infection; it may also have an impact on the transmission of tuberculosis in the community. Studies are urgently needed to evaluate the feasibility and economics with preventive chemotherapy as well as to determine optimal methods of implementing preventive chemotherapy programs in various settings. The potential for increasing compliance with preventive chemotherapy through home-based/community care should also be assessed.

Strengthening and improving existing national tuberculosis programs (NTPs).

Priority must be placed on strengthening and improving NTPs in addition to research. Existing NTPs should be evaluated and studied extensively at all levels (diagnosis, treatment strategies, monitoring and supervision of patients for compliance, prevention strategies) to determine which aspects of their programs are the most effective and which are the least. The findings of these studies should be widely disseminated and used to restructure, strengthen, and improve existing NTPs to bring the resurgence of tuberculosis in Africa under control. Initial efforts must focus on programs in areas with high rates of HIV infection and drug-resistant tuberculosis.

Monitoring of tuberculosis drug resistance in HIV-infected patients

It is not known how much of an impact HIV infection is having on the development and propagation of multi-drug-resistant tuberculosis in sub-Saharan Africa. Systemic drug resistance surveillance will need to be instituted in NTPs to monitor this problem.

Coordination of TB and HIV/AIDS prevention activities

The TB/HIV co-epidemic warrants close cooperation between tuberculosis and HIV/AIDS control programs. How to coordinate with or integrate HIV/AIDS prevention activities into existing national tuberculosis programs must be assessed. An assessment of how to cross-train health care workers in TB and HIV/AIDS programs should also be included.

Research issues to be addressed:

- How can tuberculosis be diagnosed (early and correctly) in HIV-infected persons presenting at health facilities? Assess diagnostic methods (quality, costs, benefits) to improve TB diagnosis of HIV-infected persons in field settings.

- Assess the cost and impact (use of tuberculosis services, care provided, treatment outcome, patient compliance, social consequences) of HIV counseling and testing in patients with tuberculosis.

- What are optimal methods of implementing preventive chemotherapy programs in various settings? Assess the feasibility and economics of preventive chemotherapy programs. Included an assessment of how home- and community-based programs can contribute to improved compliance with preventive chemotherapy of TB patients.

- How can existing tuberculosis programs be strengthened and improved at all levels (diagnosis, treatment strategies, monitoring and supervision of patients for compliance, prevention strategies) for effective control of TB in areas with high rates of HIV infection and drug-resistant tuberculosis?

- How can HIV/AIDS prevention activities be coordinated within existing national tuberculosis control programs?

- Using tuberculin surveys, assess the annual risk of infection to determine whether high HIV prevalence in the community is associated with increased transmission of *M. tuberculosis.*

- Study health-seeking behaviors and compliance with treatment in HIV-infected patients, and how these are influenced by cultural, social, and health-care-system-related factors. This is important for developing strategies to diagnose TB/HIV at an earlier stage.

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