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5. Author(s)

1. M Potts
PJ Feldblum
2.
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Changing Behavior: Barrier Methods in High-Risk Populations

Malcolm Potts and Paul J. Feldblum

Acquired immune deficiency syndrome (AIDS), viewed from a pathophysiologic perspective, is a relatively simple disease, but, viewed in the human context, AIDS is a complex problem. Since this new infection is sexually transmitted, AIDS appears first in individuals who have the largest number of sexual partners. The paramount problems in this dreaded disease are not virology—the molecular details are understood; nor prevention—the limited choices are starkly simple; nor surveillance—the data are more than sufficient to scare us. Rather, the key issues are institutional, bureaucratic, and political. The patterns of sexual activity that epidemiologists call “variance from the mean” are viewed by some decision-makers as “perversion.”

We face two problems in trying to change the behavior of and provide barrier methods for high-risk populations: 1) understanding the advantages and disadvantages of barrier methods and identifying problems associated with their distribution and acceptance and 2) securing the freedom of action necessary to implement programs of education and service.

SEXUAL BEHAVIOR

It is self-evident that individuals who have many sexual partners are both more likely to acquire human immunodeficiency virus (HIV) infection and to transmit it to others. Epidemiological models show that a given number of sexual acts distributed among a small number

Heterosexual Transmission of AIDS, pages 69-79
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of persons, each with many sexual partners, presents more risk to the individuals involved and to the remaining community than the same number of coital acts distributed among a large number of persons, each with a small number of sexual partners during a lifetime. Thus, the most sexually active persons affect the epidemic in disproportion to their number in the population.

Several computer models of HIV spread [1,2] agree on the following four predictions.

- 1 HIV infection through contaminated blood, although tragic, is not a major factor in the epidemic.
- 2 Casual sexual partnerships may give rise to a self-sustaining epidemic, but spread will be slow.
- 3 Groups with high-risk behaviors will greatly accelerate the spread of HIV infection throughout the remainder of society.
- 4 A reduction of high-risk behaviors not only protects the lives of the individuals involved in those behaviors but has the potential to slow significantly the spread of the epidemic throughout society.

Like other polygamous or promiscuous primates, such as gorillas or chimpanzees, *Homo sapiens* are sexually dimorphic (males are 15% to 20% heavier than females), and the testis/body ratio in males is high, as in other primates that mate frequently, compared with genuinely monogamous apes, such as gibbons [3]. In many societies past and present, most men have more sexual partners during a lifetime than most women. The extra partners for a substantial number of men come from a small number of women who provide sexual services for money. One consequence of this pattern is that men tend to get sexually transmitted diseases (STDs), and by inference AIDS, from casual sexual encounters, whereas most women's infections tend to come from steady partners.

The sexual practices of homosexual men and homosexual women differ greatly. At least until recently, gay men have tended to seek frequent erotic outlets with a large number of partners. Lesbian women tend to establish more stable long-term relationships in which erotic contract is less significant [4].

The distribution of the number of lifetime sexual partners is asymmetrical, with a small number of persons having many partners and a majority of individuals having a few partners (Fig. 1). Recent data [5] from the United Kingdom suggest that, although one-third of women under age 30 years have had one lifetime sexual partner, the

TABLE 1. Factors Influencing Condom Failure Rates^a

	Cigarette smoking by women			χ^2
	Never a smoker	Ex-smoker	Current smoker	
Number of failures	282	92	222	
Crude pregnancy rate per 100 woman-years	2.7	3.6	3.8	15.7 (0.001)
Adjusted rate	2.7	3.5	3.8	16.5 (0.001)

^aReproduced from Vessy et al. [10] with permission of the publisher.

majority of women (85%) have not had more than one new partner in the past year. The same study also suggests that women who begin intercourse under the age of 16 years have more frequent intercourse and more sexual partners as teenagers and through their twenties than do women who begin intercourse after age 16 years.

USE OF BARRIER METHODS

How likely are groups that are at high risk of acquiring and transmitting HIV to use barrier methods? A review of the use of barrier methods as contraceptives may help to answer this question.

Worldwide, an estimated 40 million couples rely on condoms for family planning, only 13 million of whom are in the Third World. Seven times as many men use condoms in Japan as in the whole of Africa, where fewer than one man in 200 uses condoms [6]. However, social marketing programs for condoms are highly successful in Bangladesh, India, and Colombia; they are likely to be the most cost-effective way to reach low-risk populations in Third World countries.

Before the widespread use of pills and intrauterine devices (IUDs), barrier methods of contraception were the major method of family planning in western countries. In 1959, a Population Investigation Committee survey of a sample of U.K. couples found that 48% had ever used condoms and 36% were current users. In the same survey, one in eight users relied on the diaphragm. In the United States, at the same time, 31% of couples interviewed in the Family Growth in Metropolitan America Study [7] were using condoms. The use of condoms diffused from the upper to lower socioeconomic strata in the first half of the twentieth century in western countries. At the time of maximum post-war condom use in Europe and North America, the method was popular among blue-collar workers and professionals, and often appealed to couples with clearly defined sexual

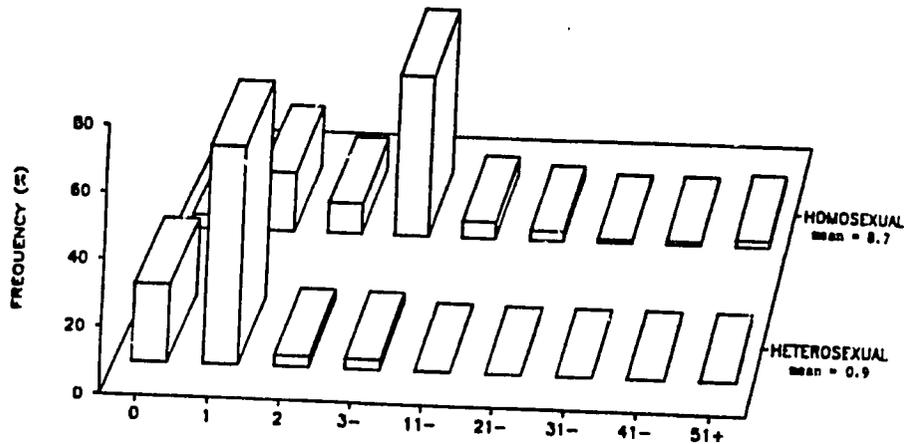


Fig. 1. Mean number of sexual partners per year, April 1986.

roles within marriage [8]. Diaphragms were primarily a middle class method. Among U.S. women using contraception in 1982, 8.3% used a diaphragm, and, interestingly, use was greater among unmarried women (13.4%) than among currently married women (6.7%) [9].

The contraceptive effectiveness of barrier-method use increases with duration of use and probably also correlates with certain aspects of personality (Table 1). For example, users who smoke have a higher failure rate for condoms than non-smoking users [10]. It seems logical that these same characteristics correlate with barrier-method use in the case of HIV or other sexually transmitted disease (STD) transmission.

The harsh reality is that individuals with the largest number of sexual partners—prostitutes and gay men—often live on the fringes of society. Prostitutes, in particular, are caught up in a cycle of poverty. At greatest risk are the poorest, most exploited prostitutes, those who have the most partners in a unit interval of time. Prostitutes often have little education, unstable family lives, and few alternative employment opportunities; they live in substandard, overcrowded housing, often smoke, and sometimes use hard drugs. Indeed, the current U.S. crack epidemic is producing a new type of prostitute who exchanges sex for drugs. Many U.S. women become prostitutes to pay for intravenous drugs, and drug abuse through injection is probably the main way they acquire HIV infection (Shedlin M, personal communication). In short, the target for barrier-

TABLE 2. Epidemiological Characteristics and Changes in Sexual Behavior of Greek Registered Prostitutes (1984-1987)^a

Characteristics	1985	1987
Median age (years)	38.4	37.8
Duration of prostitution (median years)	13.0	8.0
Mean number of sexual contacts per month	1,140.0	960.0
Use of condoms (%)	66.0	97.9
Acceptance of clients from central Africa (%)	6.5	0
Incidence of syphilis (%)	17.1	3.2
Incidence of gonococcal infection (%)	14.0	0

^aReproduced from Papevangelou et al. [16] with permission of the publisher.

method use is precisely those persons who are least likely to use barrier methods of contraception.

PROGRAMS

Important changes can occur in response to realistic interventions. Gay men in the United States and Europe began to educate themselves about AIDS as they became aware of the disease. A slowing of HIV acquisition [11] and a fall in STDs suggest that these gay men are having fewer partners and are using condoms more carefully [12]. In Britain, the mean annual number of partners of homosexual men fell from 10.5 in April, 1986, to 4.8 in January, 1987 [13,14]. At one STD clinic in London, the gonorrhea prevalence rate fell from 15.3% in 1982 to 5.1% in 1986 [15]. The use of persons with AIDS as peer educators seems to have been an important factor in behavior changes among gay men.

Western prostitutes already use condoms quite well. In New York, condom use is widespread for oral and vaginal intercourse, but prostitutes still have unprotected intercourse with their "pimps," who often use drugs. However, interventions to educate and to distribute condoms to prostitutes have changed some behaviors in a relatively short time (Table 2) [16]. North and Chantler (see, respectively, Chapters 23 and 25, this volume) discuss the potential role of spermicides in women at high risk for HIV infection.

Barrier methods must be promoted in all appropriate ways. Persons at highest risk for HIV infection may not read newspapers nor listen to the radio, and prostitutes often work during prime-time television hours. Although conventional promotion (i.e., at clinics or workplace or through social or commercial marketing) is essential to validate the method and is a cost-effective way to reach the most

people, more direct, face-to-face strategies must be pursued among high-risk groups. Every effort must be made to empower prostitutes to take greater control of their lives [17]. Decriminalization of prostitution must be considered.

HIV can spread at a devastating rate among prostitutes. In Nairobi, prevalence jumped from 7% in 1980 to over 80% in 1987. In Tamil Nadu, India, 10 of 102 prostitutes tested were HIV-positive [18]; in Thailand, 23 of 892; and, in the Philippines, only five of 3,500, but in the absence of contradictory evidence, it is prudent to assume that prevalence may increase as it has in Africa.

Relatively few interventions have been made to slow HIV transmission in Third World prostitutes. Health education has been conducted with one group of prostitutes in Nairobi who have been followed for years [19]. The adjusted relative risk of acquiring HIV among prostitutes who claimed to use condoms was 0.11 (Cameron DW, in preparation). Family Health International (FHI) has begun interventions among prostitutes in Ghana; Cameroon; Mali; Burkina Faso; and Juarez, Mexico. One approach to high-risk behavior interventions among prostitutes is to train selected ones to teach their peers about AIDS and about ways to prevent the spread of HIV infection. The preferred approach is to persuade women to give up prostitution, and sometimes this happens. But most prostitutes are poor and support children; they cannot leave the business and must be taught to protect themselves. Some change in prostitute and client behavior can be achieved relatively quickly. Prior to peer counseling and free condom distribution in Yaounde, Cameroon, 53% of 125 prostitutes used condoms with their clients "from time to time" or more frequently. During the intervention, almost all the women accepted condoms, and, when questioned 3 months later, 96% of those available for follow-up reported that they were using condoms "from time to time" or more frequently.

Building on experience already gained, FHI's AIDSTECH program is developing 26 intervention projects with high-risk behavior groups in countries such as Burundi, Kenya, Nigeria, Senegal, Tanzania, Zaire, Zimbabwe, Dominican Republic, eastern Caribbean, Ecuador, El Salvador, Peru, Philippines, and Thailand (as well as those countries mentioned earlier). In most of these countries, high-risk behavior group interventions will begin as small projects, will be reviewed and modified as experience is gained, and will be expanded into large-scale programs and replicated as quickly as resources permit. Planning for program expansion and replication must be an integral part of intervention activities.

Improving the diagnosis and treatment of STDs, especially of gen-

ital ulcers, may also prove to be an effective and important intervention that will reduce HIV transmission. Oral antibiotic treatment for chancroid is relatively straightforward [20].

The objective assessment of interventions with prostitutes will be difficult [21]. Indicators of program success vary from intervention to intervention but commonly include measurement of at least one of the following indicators: improvement in knowledge of AIDS and how it is transmitted, decreased prevalence of STDs among target groups, decreased incidence of HIV infection among target groups, compliance with condom use, and number of referrals or visits to the STD treatment site. Validating the effectiveness of intervention programs with high-risk groups will be important. Prostitutes, in particular, are exploited persons who often respond enthusiastically to genuine offers of help. We suspect that they may overreport condom use to please the project staff.

ISSUES

In the last analysis, the problem may not be as much in education and condom distribution as in obtaining the freedom to act and in generating the political will to initiate programs and replicate successful ones. Barrier methods have their limitations, and effort and patience will be needed to achieve wide use by high-risk populations. A key problem is that unpopular minorities often are at greatest risk of HIV infection, whereas those who control society's resources, whether in a democracy or a more centralized state, intuitively respond to the expressed or implied needs of the majority. This issue is relevant to foundations and to nongovernmental, governmental, and intergovernmental agencies that plan interventions. Therefore, we have a conflict. From one point of view, interventions with high-risk populations are a public health opportunity. HIV is a fragile virus and even a modestly successful program of protection with barrier methods can have a powerful impact. Communities of prostitutes and gay men are primarily urban, concentrated in limited areas, few in number, and easily identified. Offering help to those most likely to acquire and transmit the disease is scientifically conservative.

From another viewpoint, such interventions are a policy maker's nightmare. The accusation that a foundation or tax money is promoting prostitution or a gay lifestyle is discomfoting to even the most concerned member of a national AIDS committee or the most experienced administrator of international aid. Some decision makers either want to deny certain lifestyles or are reluctant to recognize

that these lifestyles spread the disease. The attention given to cleaning up the blood supply reflects a counterpoint: contaminated blood endangers society in general, so all of society responds enthusiastically. Indeed, people who get AIDS through blood transfusion are perceived as innocent.

In many ways, experience with AIDS is a speeded-up rerun of the global family planning experience. For 10-15 years, some nations denied they had a population problem. As a consequence, population growth is out of control today in countries as different as China and Kenya. Similarly, Uganda, Zaire, the United States, and many other countries denied for 12-36 months that they had an AIDS problem. Consequently, the problem today is more difficult and more expensive.

CONCLUSIONS

The World Health Organization (WHO) leadership in this area is appropriately called the Global Programme on AIDS. Important support is available from the European economic community and a number of bilateral programs, including the Agency for International Development (A.I.D.) and the AIDSTECH/AIDSCOM programs supported by A.I.D.

Enough is known about intervention with prostitutes and gay men to begin to replicate interventions in every exposed group. Although attention must be paid to parts of India, Southeast Asia, and Latin America, emphasis in the next 12 months should be on Africa. We must set up a global strategy even though we need more information about the most acceptable and cost-effective way of making such interventions available.

In reality, most interventions are in the pilot project stage. Any intervention, particularly in the Third World, takes time to start. Therefore, we must begin the necessary initiatives in the next 12 months, and expect to modify them as we gain experience from the earlier pilot projects. The behavior of our institutions must change if we are to succeed in changing the behavior of high-risk groups. The international community has made available more than \$60 million for AIDS programs in the Third World (Bialy G, personal communication). A modest part of these resources probably can cover high-risk groups in much of the world. The success or failure of the use of available resources can be determined by how many cases of HIV transmission are prevented.

The vast majority of people, even prostitutes, worldwide are not infected with AIDS. Barrier methods are the closest thing we have to

a "vaccine." The public health policies used to distribute vaccines must be applied to the distribution of barrier methods to populations at high risk. To eliminate smallpox, the world needed a well managed global program that tracked down the disease in the most remote parts of the poorest countries. To slow the spread of AIDS, we must have a similar global strategy that is comprehensive in its plan and well managed in its execution and that covers all groups with high-risk behaviors.

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DISCUSSION

DR. PADL.N: I was wondering if you could comment on using prostitutes as educators? I have read several articles lately that talk about the importance of instituting prevention programs among prostitutes. Because prostitutes themselves are effective educators, they could be used to disseminate information on methods to prevent transmission.

DR. POTTS: I think that is very true. After all, condoms have been around since the sixteenth century, and they were initially used for protection against STDs. They then got into family planning and contraceptive use.

We have to empower prostitutes, first of all, to work as units. We want situations where every prostitute in a brothel says, "You cannot have sex unless you use a condom." Then I think we can get rapid change. And men who use condoms in those situations may also learn that it is not a totally bad or difficult thing to use a condom.

I would like to think we can have educational programs for the clients of prostitutes, but they are so diffuse; they are between 10% and 50% of all men, and are difficult to reach. So, with limited resources, I suggest targeting the women, educating them, and giving them the necessary supplies; we should not make them scapegoats, but, in my opinion, this is the most effective thing that the virus is telling us we can do in 1989.

DR. WILLIAMSON: I want to make a comment comparing working with prostitutes in the United States and in the developing world. I think it is easier to work with prostitutes in the developing world because they do not have the tangle of pathologies that you sometimes find in the United States. They are not drug users. They are not partners of drug users. They are not as stigmatized as in the United States. They are not minorities. Very often they are widows. They are women with children, and, I think, they are more receptive to health education than U.S. prostitutes. Nevertheless, there have been successes with prostitutes in the United States. But I think the work we have done shows that prostitutes in developing countries are very receptive to these education programs, and we have not encountered the obstacles that people said we would encounter.

DR. POTTS: I agree entirely. My wife and I were in a brothel 2 weeks ago in Mexico; the women were so receptive. They said, "Thank you for coming." They came from extended families, and they had not been raped when they were 9 years old, or sexually abused in some terrible way. They were really very responsive. Although this is a difficult area, I have every confidence that now is the time to move out in a global program, and that this is, I believe, the best use of our resources. I think that this meeting is going to refine how we do those things. I am merely saying that the program implementors should start working with prostitutes; they should be wise and realize that we are going to make a lot of mistakes and that we are probably going to get some political flak, but, in my experience, not as much as people believe.