

A Survey of College Women  
Regarding Their Knowledge, Perception of Personal  
Susceptibility, and Behaviors About AIDS

by

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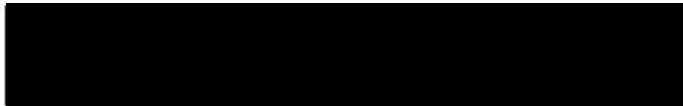


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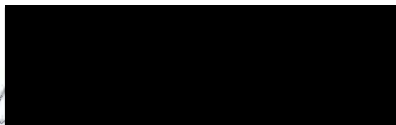
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## CHAPTER I

### Introduction

Acquired immunodeficiency syndrome (AIDS) has emerged as a major public health threat within the past seven years. The causative agent of AIDS is a retrovirus, identified as the human immunodeficiency virus (HIV). Initially the syndrome, which causes irreparable damage to the body's immune and nervous systems, was primarily associated with homosexual men and intravenous drug users (IVDU) (CDC, 1981; Masur et al., 1981). However, heterosexual transmission of HIV has been increasing (CDC, 1985a; Harris, Small, & Klein, 1983) and now presents a substantial potential risk to women.

HIV is transmitted through infected blood, semen, and vaginal and cervical secretions (Biggar, 1987). Although small amounts of the virus have been found in saliva and tears, no instance of transmission via these body fluids has been reported to the Centers for Disease Control (CDC). Currently, it is estimated that 1.5 to 2 million Americans are infected with HIV; 20% to 30% of these are expected to develop AIDS by 1991 (Morgan & Curran, 1986; Ebbesen, 1986). Eight percent of AIDS cases are women; if this rate continues at least 24,000 of the projected AIDS cases in 1991 will be women.

The Oregon State Health Division (OSHD) has estimated that between 8,000 and 16,000 Oregon residents are currently infected with HIV (OSHD, 1987d). As of March 31, 1988, 339 Oregon residents

have been diagnosed with AIDS; eleven of these cases are female (OSHD, 1988). Nationally, the number of cases reported is doubling every 14 months; the doubling interval in Oregon as of March 1988 was 12 months (J. Sampson M.D., personal communication, April 15, 1988). Thus far homosexual/bisexual males and homosexual male IVDU comprise 78% and 11% of the Oregon cases respectively. However, heterosexual transmission of HIV is an increasing concern in Oregon as it is nationwide.

Among women in the United States, AIDS has been reported most commonly in IVDU. The second most common risk factor for women has been heterosexual intercourse with a person at risk for AIDS (Guinan & Hardy, 1987). Additional considerations for women regarding AIDS include a 40 to 60% risk of perinatal transmission of HIV from infected pregnant women to their infants (Lapointe, Michaud, Pekovie, Chausseau, & Dupuy, 1985; Liskin & Blackburn, 1986) and the potential that pregnancy could exacerbate the course of HIV infection (Minkoff, 1986).

Given the data presented and the fact that there is as yet no vaccine or cure for HIV infection, it is imperative that nurses focus on the prevention of AIDS among women. Nurses are in an especially advantageous position to address this problem: they frequently have direct contact with sexually active women in their childbearing years. Successful reduction of women's risks for AIDS depends on an understanding of their knowledge, perceptions, and behaviors regarding AIDS. To date, information regarding AIDS has

primarily been drawn from studies of gay men, resulting in a conspicuous gap in the literature regarding women.

The purpose of this study is to gather descriptive data about the problem of prevention of AIDS among women in a sample of college students. The Health Belief Model (Rosenstock, 1974), which describes factors involved in the adoption of preventive health measures, will provide a framework for examination of the phenomenon of women and AIDS.

The problem of prevention of AIDS among women is too complex to be solved in a single study. However, the data gained regarding the sample's knowledge, perception of personal susceptibility, and behaviors concerning AIDS may contribute to an understanding of the factors involved in primary prevention of AIDS among women.

## CHAPTER II

### Review of the Literature

Despite the relatively recent discovery of AIDS, a large amount of research has been generated. The following review of the literature will include the epidemiology, natural history, psychosocial issues, social policy concerns, recommendations for prevention, and studies of knowledge, perceptions, and behavior regarding AIDS. Also reviewed is literature pertaining to the Health Belief Model (HBM), the conceptual framework chosen for this study. The focus of this review will be on literature relevant to a study of women and AIDS.

#### Epidemiology

##### Routes of Transmission

HIV has been isolated from the following body fluids: blood, semen, vaginal and cervical secretions, breast milk, and saliva (Groopman et al., 1984; Ho et al., 1984; Thiry et al., 1985; Vogt et al., 1986; Wofsy, et al., 1986). Consequently, the primary routes of transmission of HIV involve the exchange of infected body fluids via unprotected sexual intercourse, sharing or reusing contaminated needles, and transfusion of contaminated blood or blood products. The virus has also been transmitted from infected mothers to their fetus or newborn either in utero or during labor and delivery and, in one instance, via breast milk (Liskin & Blackburn, 1986; Mead, Galask, Minkoff, & Schwarz, 1986; Minkoff, 1986; Peterman & Curran, 1986; Ziegler, Cooper, Johnson, & Gold,

1985). However, there is no direct evidence for HIV transmission by saliva (Friedland et al., 1986).

Investigations of nonsexual household members living with persons with AIDS or AIDS-related complex (ARC) have consistently failed to demonstrate casual transmission of HIV (Biggar, 1987; Friedland et al., 1986; Peterman, Stoneburner, Allen, Jaffe, & Curran, 1988). By the end of 1986, only one case of nonsexual household member transmission had been reported to the CDC. This transmission occurred in a mother caring for her infected infant son. Subsequent investigation of the case revealed the mother had been repeatedly exposed to body secretions in the care of her infant and had not taken recommended precautions (CDC, 1986b).

The actual risk of transmission of the AIDS virus per each exposure is unknown. A number of independent investigations indicate that HIV is less likely to be transmitted during a single exposure than some other diseases. For example, the risk of transmitting the Hepatitis B virus via one contaminated needle-stick injury may be as high as 25% versus less than a 1% risk of infection with HIV via a needle-stick injury (Seef et al., 1978; McCray, 1986). Furthermore, in a study of 89 female partners of men who were either infected with HIV or diagnosed with AIDS or AIDS-related complex, a per exposure infectivity rate of .001 was calculated (Padian, 1987). This is in contrast to a 50% rate of transmission of gonorrhea to a woman whose male partner is infected (Platt, Rice, & McCormack, 1983). In another study, the risk of

becoming infected with HIV after several years of unprotected sex with the same infected partner varied from 10% to 45% (Van der Graaf & Diepersloot, 1986).

#### Transmission Categories

The identification of transmission routes has resulted in the classification of risk factors by which the prevalence of AIDS is reported. The CDC utilizes the following "transmission categories" for surveillance purposes: homosexual/bisexual male; intravenous drug user (IVDU); homosexual male and IVDU; hemophilia/coagulation disorder; heterosexual cases; transfusion, blood/components; and none of the above/undetermined. The current prevalence of AIDS by transmission categories, both nationwide and in Oregon, is presented in Tables 1 and 2 respectively.

It is important to understand that the numbers of AIDS cases reported here represent only the end stage of HIV infection. The actual prevalence of HIV infection is much greater, but is not known with certainty. The CDC has estimated that between 1.5 to 2 million persons in the United States are currently infected; 25 to 50% of these persons are predicted to develop AIDS within five to ten years (OSHD, 1987a). Projections regarding the incidence of future HIV infection are lacking in the literature. Such estimates will depend upon an assessment of the degree to which preventive behaviors are adopted.

Table 1.

Case Groups: UNITED STATES (Adults, March 28, 1988)

	Males No. (%)	Females No. (%)	Total No. (%)
Homosexual/Bisexual Men	36234 (69)	---	36234 (64)
Intravenous (IV) Drug User	7971 (15)	2221 (51)	10192 (18)
Homosexual/Bisexual and IV Drug User	4226 (8)	---	4226 (7)
Hemophiliac/Coagulation Disorder	548 (1)	23 (1)	571 (1)
Heterosexual Cases	1034 (2)	1251 (29)	2285 (4)
Transfusion, Blood/ Components	896 (2)	479 (11)	1375 (2)
None of the Above/ Undetermined	1404 (3)	375 (9)	1779 (3)
SUBTOTAL	52313 (100)	4349 (100)	56662 (100)

Note. From CDC, 1988.

Table 2.

Case Groups: Oregon (Adults, March 31, 1988)

	Males No. %	Females No. %	Total No. %
Homosexual/Bisexual Men	265 (81)	---	265 (78)
Intravenous (IV) Drug User	9 (3)	3 (27)	12 (4)
Homosexual/Bisexual and IV Drug User	36 (11)	---	36 (11)
Hemophiliac/Coagulation Disorder	9 (3)	---	9 (3)
Heterosexual Cases	---	4 (36)	4 (1)
Transfusion, Blood/ Components	6 (2)	4 (36)	10 (3)
None of the Above/ Undetermined	3 (1)	---	3 (1)
SUBTOTAL	328 (100)	11 (100)	339 (100)

Note. From Oregon State Health Division, 1988.

Homosexual/Bisexual Male. As mentioned earlier, the majority of studies on AIDS have investigated homosexual and bisexual males. The San Francisco Cohort Study (Hessol et al., 1987; Jaffe et al., 1985) has been instrumental in gathering epidemiological data on HIV infection within this transmission category. This cohort study was undertaken with a sample of 6,709 homosexual and bisexual men. These men had participated in a study on Hepatitis B between 1978 and 1980; their blood samples had been preserved and were thus available for use in an HIV prevalence study.

In late 1983, Hessol et al. (1987) began a prospective study with a sample of 719 (11%) men who were randomly chosen from the entire cohort sample. Of these, 63 (9%) were known to have seroconverted (produced antibodies in response to HIV) before the studies began. These 63 men have been followed for a mean of 76 months since their initial seropositive specimen or estimated date of seroconversion: 19 (30%) had AIDS; 30 (48%) had persistent generalized lymphadenopathy (PGL) or AIDS-related Complex (ARC); and 14 (22%) were asymptomatic.

Homosexual and bisexual men continue to account for the highest percentage of reported cases of AIDS, both nationwide and in Oregon (see Tables 1 and 2). Estimates of the prevalence of asymptomatic HIV infection among homosexual men vary. The San Francisco Cohort Study (Hessol et al., 1987) reports that approximately 70% of the entire cohort are currently infected with HIV. In Portland, Oregon, the percent of homosexual men with

asymptomatic infection is estimated to be 20% as compared to 40% in Seattle, Washington (V. Fox, personal communication, May 10, 1987).

Research conducted with homosexual men supports the hypothesis that two factors in particular are associated with a higher risk of transmission: receptive anal intercourse and an increased number of sexual partners (Goedert et al., 1984; Kingsley et al., 1987; Winkelstein et al., 1987). Additional variables associated with AIDS in homosexual men were documented in a nationwide study of 50 AIDS patients and 120 matched male homosexual controls (Jaffe et al., 1983). These variables included a history of treatment for enteric parasites, syphilis, and hepatitis other than hepatitis B, as well as a greater lifetime exposure to amyl and butyl nitrate inhalants.

Unprotected sexual exposure to the HIV among homosexual men does not consistently result in HIV infection. Seage et al. (1987) studied 158 homosexual partners of persons with AIDS, AIDS-related complex, and HIV seropositive and seronegative men. Of the 158 pairs, 63 (40%) were both seronegative, 42 (27%) were both seropositive, and 53 (33%) had discordant HIV antibody test results. None of the 36 discordant partners who returned for a 6 month follow-up had become infected despite the fact that 27 (75%) had engaged in unprotected sexual activities with their infected partners during that time period.

Intravenous Drug User. Persons with a history of intravenous drug use (IVDU) account for the second largest transmission

category nationwide (see Table 1). The prevalence of HIV infection in this group is viewed with particular concern as experts predict that sexual contact with infected IVDU's represents a potentially significant mode of transmission to the general heterosexual population.

New York and New Jersey metropolitan areas have reported the highest numbers of AIDS cases in this transmission category to date (Allen & Curran, 1988). Furthermore, estimates of asymptomatic seroprevalence among IVDU's in New York and New Jersey have ranged as high as 87% (Biggar, 1987; Spira et al., 1984). The New York City Health Department recently reported that AIDS cases among IVDU's outnumbered cases among homosexuals for the first time during the first three months of 1988 ("Drug-abuse", 1988). Currently, twelve cases of AIDS among IVDU in Oregon have been reported; nine are male and three are female (see Table 2).

Transmission among IVDU occurs via the practice of sharing intravenous needles. Several studies have implied that differences in prevalence between geographic areas reflect variances in the practice of needle-sharing among IVDU (Chaisson, Moss, Onishi, Osmond, & Carlson, 1987; Ginzburg, 1984). For example, Chaisson et al. (1987) reported that fewer "shooting galleries" operate in San Francisco as compared to the east coast.

This transmission category holds special implications for women regarding AIDS: a history of IVDU is the most common risk factor for women with AIDS, accounting for 51% of all female cases

nationwide. Furthermore, HIV infection in IVDU is significantly more prevalent in Blacks and Latinas than Whites (CDC, 1986a). Finally, female IVDU infected with HIV are the major source of cases of perinatally acquired HIV infection (Guinan & Hardy, 1987).

An analysis of 19,181 AIDS cases reported to the CDC as of April 7, 1986, revealed significant differences in the racial composition of the transmission categories (Bakeman, Lumb, & Smith, 1986): only 14% of Whites with AIDS were in the IVDU category compared to over 42% of Blacks and other nonwhites with AIDS. Furthermore, a subsequent review of women with AIDS revealed that more than 70% of the cases have occurred among Blacks and Hispanics, a figure largely reflecting the IVDU among women in this sample (Guinan & Hardy, 1987).

Two separate studies conducted in San Francisco have documented significant increases in the rate of seroconversion among IVDU within a one year period. Watters (1987) tested 401 IVDU in 1986 and 629 IVDU in 1987 and reported seropositive rates of 9% and 15% respectively. These figures represent a 60% increase in the rate of seroconversion for the year. While there were no significant differences between male and female IVDU in this study, there were differences between Blacks and other ethnic groups, with Blacks at highest risk. In another, as yet unpublished study in San Francisco, female IVDU attending a methadone clinic showed an increase in seropositive results from 8% to over 18% within one year (Oliva, Di Clemente, Purser, & Rutherford, 1987).

Homosexual/Bisexual and IV Drug User. The prevalence of AIDS cases among persons who are both homosexual/bisexual and IVDU in the United States and in Oregon is 7% and 11% respectively (see Tables 1 and 2). The CDC added this category in 1986 to allow more accurate surveillance of AIDS cases.

Hemophiliac/coagulation disorder. Although the total number of cases in this transmission category is small (see Tables 1 and 2) compared to the above groups, AIDS has had profound effects on hemophiliacs and their partners. There are approximately 14,400 persons with either hemophilia A or hemophilia B in the United States (Hardy et al, 1985). Widespread transmission within this group has occurred due to the administration of clotting factors and blood transfusions. Clotting factor concentrates are produced using pooled plasma; each vial can contain material from between 2,500 to 25,000 blood or plasma donors (Levine, 1985) thereby presenting a substantial risk. Indeed, it is estimated that 92% of persons with hemophilia A and 52% of those with hemophilia B are now seropositive (CDC, 1986d). The proportion of HIV infected hemophiliacs who will eventually develop AIDS is unknown. An additional concern regarding hemophiliacs is the risk of infection to their female sexual partners.

Heterosexual Cases. Heterosexual cases include those who have had heterosexual contact with a person with AIDS or at risk of AIDS and those without other identified risks who were born in countries where heterosexual transmission is believed to play a major role

(CDC, 1987f). Heterosexual cases account for 4% of the total cases of AIDS in the United States. As of March 31, 1988, there were four female cases of heterosexually transmitted AIDS in Oregon, representing 36% of female cases in the state.

This transmission category is particularly important with regard to a study of women and AIDS. First, it is the only predominantly female category: nationally, 55% of heterosexual cases as of March 28, 1988 are female. It also represents the most rapidly increasing group of female AIDS cases: between 1982 and 1986 the proportion of women in this category increased from 12% to 26% (Guinan & Hardy, 1987). Furthermore, evidence exists that the risk of heterosexual transmission may vary between men and women. The CDC reports less than 1% of all AIDS cases to be among men whose only known and verified risk factor has been contact with an infected or high risk woman whereas 21% of all AIDS among women has been linked to sexual contact with an infected or high risk man (Guinan & Hardy, 1987). This disproportion is apparent in New York where 30% of all U.S. AIDS cases have occurred: of the 182 heterosexual cases reported in New York City through 1986, 179 are female (Chaisson, Stoneburner, Lekatsas, & Walker, 1987). At least two factors may account for this difference: there is a larger pool of infected men and most sexually transmitted diseases are more readily transmitted from men to women than from women to men (CDC, 1985a). For example, the 50% rate of transmission of Neisseria Gonorrhea to a woman during a single sexual contact with an

infected man is nearly twice that of an infected woman to an uninfected man (Platt et al., 1983).

Among female heterosexual cases, the greatest risk factor reported has been sexual contact with a male IVDU (Guinan & Hardy, 1987). A recent study found this to be a greater risk factor for HIV infection than having a bisexual partner or even multiple sexual contacts with men not in AIDS risk groups or whose risk status was unknown (Cohen, 1987). The latter study also documented a higher risk of HIV infection among women who reported frequently having sexual intercourse during their menses.

One study investigating heterosexual women concluded that penile-anal intercourse posed a greater risk of HIV transmission from an infected man to an uninfected woman than did penile-vaginal intercourse (Padian, 1987). However, this finding has not been supported by other studies.

A comparison of heterosexual women and men with AIDS has revealed differences between age groups affected and geographic distribution (Guinan & Hardy, 1987). Specifically, more female than male cases of AIDS were in the 20 to 29 year age group (32% versus 20%,  $P < .001$ ), and fewer women were in the 40 to 49 year age group (11% versus 18%,  $P < .01$ ). Consequently, the majority of women with AIDS are in their childbearing years and may therefore transmit HIV to their newborns. Regarding geographic distribution, New York reports the highest numbers of both male and female cases of AIDS. New Jersey has the second highest number of female cases

and California reports the second largest number of male cases (Guinan & Hardy, 1987).

Recently, efforts to monitor the prevalence of HIV among the heterosexual population have focused on the assessment of seroprevalence in sexually transmitted disease clinics and prenatal clinics. Findings thus far have included seroprevalence rates of 0.21% among 30,708 childbearing women in Massachusetts (Hoff et al, 1988), 2% among 602 childbearing women in New York City (Landesman, Minkoff, Holman, McCalla, & Sijin, 1987), and 5.2% among 4028 clients attending clinics for sexually transmitted diseases in Baltimore (Quinn et al, 1988).

Transfusion with Blood or Blood Products. The prevalence of AIDS among persons in this transmission category has been relatively low (see Tables 1 and 2). Due to antibody testing of all blood and plasma donated since the spring of 1985 as well as the request that persons with risk factors avoid donating blood, the number of future cases is not expected to be significant. Estimates of the current number of persons with transfusion-associated HIV infection in the United States range from 10,000 to 12,000 cases (CDC, 1987b).

Among transfusion recipients, the risk of infection is greatest if multiple units were transfused and if the blood was collected during the years 1978 - 1984 in an area of high incidence of AIDS (CDC, 1987b). The risk of seroconversion among transfusion

recipients of infected blood appears to be as high as 40 to 60% (OSHD, 1987a).

This route of transmission has had significant impact in the state of Oregon: four of the eleven female AIDS cases to date were infected by contaminated blood transfusions (see Table 2). However, the 0.009% seroprevalence of HIV among blood donors in Oregon as of December 1986 is much lower than the 0.04% estimated seroprevalence of United States blood donors (OSHD, 1987a).

None of the above/Undetermined. This transmission category accounts for AIDS cases which have no identified risk factors, as well as those with incomplete information or those who have been lost to follow-up. Approximately one third of the AIDS cases in this category are persons whose single reported risk factor was sexual contact with a female prostitute (Lederman, 1986).

Among prostitutes, the prevalence of HIV infection has been demonstrated to be highly variable between different geographic locations (CDC, 1985a; CDC, 1987a; Padian, Carlson, Browning, Nelson, Grimes, & Marquis, 1987). The CDC (1987a) is currently conducting an ongoing cross-sectional study of prostitutes in seven cities: Atlanta, Colorado Springs, Las Vegas, Los Angeles, Miami, Newark-Jersey City-Paterson, and San Francisco. As of March 27, 1987, the prevalence of HIV infection ranged from zero in Las Vegas to 57% in Newark-Jersey City-Paterson. This data indicates that the prevalence of HIV infection among prostitutes reflects the overall incidence of AIDS in women in these areas.

A more recent study of prostitutes in Nevada (Padian et al., 1987) found no evidence of seroprevalence among 535 prostitutes in three legalized Nevada brothels as compared to a 6% rate among 370 prostitutes incarcerated in Nevada State Prison. Further investigation revealed that only 7% of the brothel sample had shared needles during intravenous drug use during the past five years while everyone in the prison sample had a history of sharing needles. Accordingly, the major risk factor for HIV infection in prostitutes appears to be IVDU.

As of March 31, 1988, there were three male cases of AIDS in Oregon in the "undetermined" category. However, when evaluating AIDS cases by classification, particularly those in the undetermined category, it is necessary to recognize that the cases may be reclassified depending on additional data gained via epidemiological investigation.

Currently, 9% of the female AIDS cases nationwide have no identified risk factor compared to 3% of the male AIDS cases (see table 1). One possible explanation for the higher proportion of women in this category may be that some women were unaware of a sexual partner's risk factors, such as a history of IVDU or bisexuality (Guinan & Hardy, 1987).

Delineation of the preceding transmission categories of AIDS cases demonstrates the primary risk factors for women of HIV infection. However, additional considerations regarding women and AIDS include: perinatal transmission, female-to-female

transmission, risks associated with artificial insemination, and potential exposure of the predominantly female health care workers to HIV infected body fluids.

#### Perinatal Transmission.

The risk of transmission of HIV from an infected woman to her newborn may be as high as 65% (CDC, 1985b). Furthermore, women with a history of perinatal HIV transmission to a previous infant may have an even greater risk of transmitting the virus to a subsequent infant (Minkoff, Nanda, Menez, & Fikrig, 1987). Perinatal transmission accounts for a significant portion of infants with AIDS: nearly 80% of the pediatric cases of AIDS have occurred in the infants of parents who either have, or are at risk for, AIDS (CDC, 1987f). Consequently, the trends in the number of infants with AIDS have reflected the increased cases of AIDS in women at risk, and the majority (54%) of all affected children are Black (Bakeman et al., 1986; CDC, 1987f). To date, there has been one pediatric case of AIDS in Oregon compared to 913 pediatric cases nationwide (CDC, 1987f).

#### Female-to female transmission.

Currently, there has been one documented case of female to female HIV transmission (Marmor et al., 1986). Transmission of HIV appears to have occurred as a result of sexual activity which included oral sex during menstruation, oral-anal contact, and vaginal sex of a nature that produced bleeding in both women. One of the women had a history of IVDU that included sharing needles

and is presumed to have infected her partner who had no other risk factors for exposure to the virus than that sexual contact. While this data does not reveal a new route of HIV transmission, it does underline the importance of safer sex precautions for all persons regardless of their sexual preferences.

#### Artificial Insemination.

An additional concern for women regarding HIV infection is the risk of transmission via artificial insemination. In Australia, four of eight women who received semen donated by one symptomless carrier of HIV are now seropositive (Stewart et al., 1985); three years after insemination one has developed PGL while the others remain asymptomatic. The risk of HIV transmission via artificial insemination persists if precautions, such as using only frozen semen, are not followed (Mascola & Guinan, 1986). Furthermore, it has been suggested that lesbian women may be at a greater risk because of a tendency to choose a gay friend as the semen donor (Mead et al., 1986) or possibly because of a greater use of artificial insemination.

#### Health Care Workers.

The potential risk of HIV infection among health care workers due to exposure to infected body fluids has prompted extensive investigations. One prospective study reported on 270 health care workers at San Francisco General Hospital; these health care workers were described as representing "one of the most highly exposed cohorts in the world" (Gerberding et al., 1987, p.6).

Accidental exposures to HIV, including percutaneous needlestick injuries and splashes on mucous membranes or cutaneous wounds, occurred in 94 (35%) of the sample. In fact, the latter subsample accounted for a total of 342 exposures. No evidence of HIV transmission from occupational exposure was found: none of the sample had antibodies to HIV prior to the study, and none of the 175 subjects retested 10 months later had acquired antibodies.

The preceding results have been substantiated by other ongoing prospective studies of health care workers with both percutaneous and mucus membrane exposures (CDC, 1987f; McCray, 1986). Furthermore, cumulative results from eight different studies indicate that the risk of acquiring HIV after needlestick exposure is far less than 1% (Gerberding et al., 1987).

However, the CDC has emphasized that the increasing prevalence of HIV infection will increase the risk for transmission to health care workers, particularly if recommended body fluid precautions are not followed. As of August 21, 1987, eight health care workers not included in any prospective studies have been reported to have acquired HIV infection: all had provided care to infected patients and denied other risk factors (CDC, 1987c).

### Conclusion

In conclusion, a review of the epidemiological data regarding AIDS suggests several areas of particular concern for women. First, the two major risk factors for HIV infection in women are a history of IVDU and sexual contact with a male IVDU. Second,

minority women have been more affected by AIDS than White women. Third, lesbian women are also at risk through IVDU, artificial insemination, or sexual contact. Fourth, perinatal infection reflects trends in HIV infection among women. Fifth, heterosexually transmitted HIV is projected to increase at a faster rate than other transmission categories. Large scale female cohort studies are lacking at present, but will be necessary to promote understanding of the epidemiology of HIV infection in women.

#### Natural History

Infection with HIV occurs when the virus is transmitted to a new host. Once infection has occurred, the virus initiates events that result in permanent damage to the immune system and causes degeneration of the central and peripheral nervous systems (Gallo & Streicher, 1987).

As a retrovirus, HIV has the ability to invade cells and integrate its own genetic information into the host cell genetic code. HIV selectively enters several types of immune system cells, primarily a specialized group of white blood cells called T-helper cells, as well as nerve cells. These host cells then contain a copy of the viral genome in addition to their own genetic information. Under certain conditions, host cells are activated to produce new virus which is released from the cell into body fluids. In this way, permanent infection with HIV is established (Gallo & Streicher, 1987).

The major effect of HIV on the immune system is depletion of T-helper cells. T-helper cells play a crucial role in mounting an immune response through stimulation of antibody production and maturation of other immune cell types. Loss of T-helper cells' regulatory activity devastates the host's immune defense, especially against parasitic, fungal, and viral organisms (Liskin & Blackburn, 1986).

In most cases, acquisition of HIV infection is accompanied by antibody production. Although the incubation period between exposure to HIV and detectable serum antibody is unknown for sexual transmission, antibody is usually noted within four to seven weeks after exposure from blood transfusions (Melbye, 1986). This time frame is corroborated by animal studies, which show a period of three to twelve weeks between parenteral exposure and detectable antibody. Interestingly, several cases have been reported in which serum antibody to HIV was not found despite documented viremia (Liskin & Blackburn, 1986).

#### Classification System for HIV Infection

The CDC (1986c) developed a system for clinical classification of HIV infection. The categories are:

Group I. Acute infection. Subsequent to infection with HIV, the majority of individuals show no immediate symptoms. However, within two to five weeks after infection, some develop an acute short-term illness characterized by symptoms similar to influenza or mononucleosis (Biggar, 1987). Acute neurological symptoms such

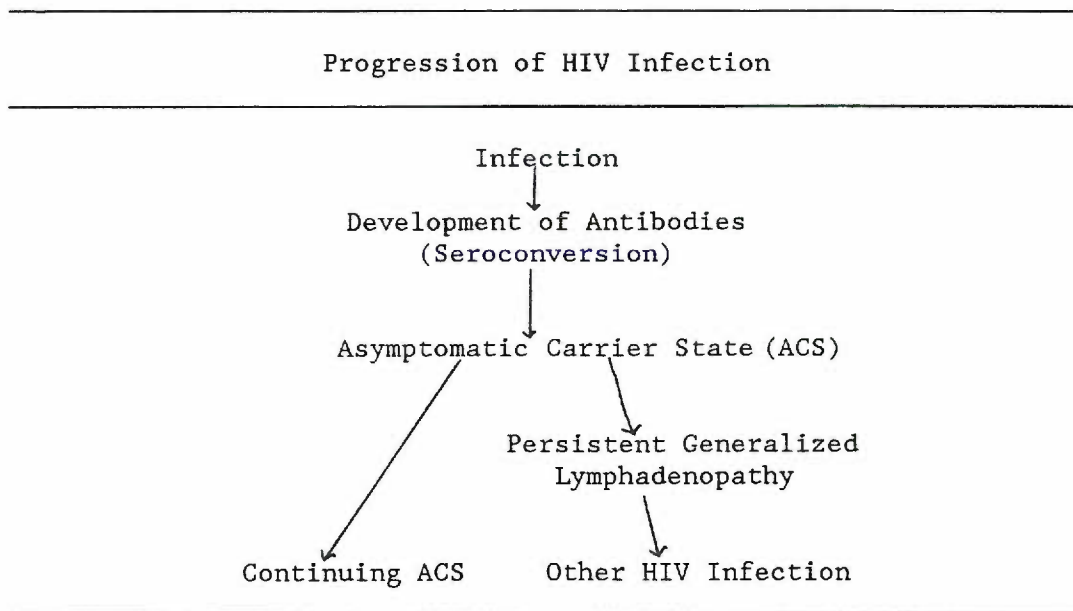
as encephalopathy, generalized seizures, or motor impairment have also been observed to accompany primary HIV infection (Berger & Resnik, 1987). The proportion of those infected who develop symptoms associated with primary infection is unknown, in part because many cases may be too mild to require medical attention. Once the acute infection has resolved, persons in this group may be reclassified into one of the following groups.

Group II. Asymptomatic carrier state (ACS). These individuals have no clinical symptoms of HIV infection but are considered infectious to others. The carrier state can be demonstrated in an asymptomatic person by a positive HIV antibody test or by isolation of virus from body fluids. A person in this category may remain without symptoms or, after an unpredictable latent period, may progress to Group III or IV (see Figure 1).

Group III. Persistent Generalized Lymphadenopathy (PGL). PGL is characterized by swollen lymph nodes of 1 cm or greater in two or more extra-inguinal sites that persist for more than three months in the absence of a concurrent illness to explain the findings. A person with PGL may remain in that category or may eventually progress to Group IV.

Group IV. Other HIV disease. This category includes persons with clinical signs of HIV infection other than, or in addition to, PGL. Therefore Group IV includes AIDS-Related Complex (ARC) and AIDS. ARC is characterized by night sweats, fever, diarrhea, and/or opportunistic infections such as thrush or Herpes Zoster.

Figure 1.



Note. Adapted from Liskin & Blackburn, 1986.

Once considered not to be life-threatening, ARC is now recognized as a serious medical condition that can in some instances lead to death (Groopman, 1987). AIDS, the end stage of HIV infection, is defined as the presence of life-threatening opportunistic infections, such as Pneumocystis carinii pneumonia (PCP), or cancers, such as Kaposi's sarcoma, in people with otherwise unexplained immune system deficits. In addition, the definition of AIDS has recently been expanded to include dementia and emaciation (CDC, 1987d).

As with acute infection, neurological symptoms are frequently seen in persons with secondary HIV infection (Berger & Resnick, 1987) with estimates of incidence ranging from 30% to 63% of

persons with AIDS. In fact, neurological complications may develop prior to the appearance of associated immunological abnormalities. Neurological deficits include cognitive impairment, dementia, and encephalitis (Berger & Resnick, 1987).

The incubation period between infection and the appearance of secondary symptoms is unknown. One early mathematical model based on transfusion-acquired cases estimated that the period prior to appearance of symptoms ranged from four months to ten years, with a mean of four and one half years (Liskin & Blackburn, 1986). A more recent statistical extrapolation suggested a 25-year mean incubation period (Rees, 1987). This data was based on an analysis of 144 transfusion acquired AIDS cases where the exact date of HIV infection was known. If this model is accurate, current predictions about the percentage of individuals who will progress from ACS to PGL or ARC or AIDS may be low. As mentioned earlier, data from the San Francisco Cohort Study on gay men indicated that after 76 months 22% remained asymptomatic, 48% had PGL or ARC, and 30% had developed AIDS as of June 1987 (Hessol et al., 1987). Research is needed to determine the impact, if any, of factors such as nutritional status, pre-existing infections such as Epstein Barr virus or cytomegalovirus, emotional stress, and other variables on the progression of HIV infection (Allen and Curran, 1988).

So far, AIDS is considered universally fatal. Nevertheless, there is a wide variability in length of survival after diagnosis of AIDS. For example, Rothenberg et al. (1987) studied 5,833 AIDS

cases in New York City. In 11% of this sample, diagnosis occurred at the time of death; 4.2% and 1.4% had survived longer than three years and longer than four years respectively, with the longest survival time being just under nine years. Survival was found to be influenced by manifestation of AIDS at time of diagnosis as well as by age, race, sex, and the route of acquisition of HIV. In a group of hemophiliac AIDS cases, 84% died within one year of diagnosis (Stehr-Green, Holman, Jason, & Evatt, 1988); there were no difference in survival rates based on race. Based on Rothenberg et al.'s sample, the upper limit of the five-year probability of survival after diagnosis of AIDS is estimated to be 15.1%. As new treatments are developed for HIV infection, the duration of survival will most likely increase.

The natural history of HIV infection in women is not well documented; most of the data in the preceding discussion comes from studies of gay men. Nevertheless, the literature does suggest some unique features of the disease in women. For example, there is a much lower incidence of Kaposi's sarcoma in women than in men, although PCP is seen about as frequently (Hauer et al., 1987). Recent work with women infected with HIV, but not necessarily symptomatic, also reveals a higher incidence of cervical and vaginal squamous cell atypia (Schrager et al., 1987).

In addition, HIV infection may progress faster in women than in men. An analysis of 5833 AIDS cases on the basis of race, age, sex, manifestation of AIDS, and risk group showed that being female

adversely affected the probability of survival after diagnosis of AIDS (Rothenberg et al., 1987). The mean survival of women and men following diagnosis was 298 and 374 days respectively. In fact, female Black IVDU's in the sample had a particularly high relative risk, whereas White gay men with Kaposi's sarcoma had the best survival probability. A study of 3661 AIDS cases diagnosed between 1981 and 1987 in San Francisco showed a median survival time after diagnosis of 12.2 months for men and 8.8 months for women although the difference was not statistically significant (Lemp, Barnhart, Rutherford, Temelso, & Werdegar, 1987). These discrepancies require further investigation. For example, based on the epidemiological fact that more women than men with AIDS are IVDU's, it is possible that women with AIDS may be more physically debilitated at the time of diagnosis.

The effect of pregnancy on the course of the disease is another aspect of the natural history of HIV infection that is significant for women. It has been speculated that HIV infection could be more fulminant in pregnancy because of the natural immune suppression that occurs in pregnant women (Liskin & Blackburn, 1986; Minkoff, 1986). This is not supported by recent evidence. Preliminary results from a prospective study failed to demonstrate an increased rate of progression of HIV infection in pregnancy in a sample of pregnant (n=17) and non-pregnant (n=30) IVDU women from a methadone maintenance program (Schoenbaum et al., 1987). In a retrospective analysis of medical records, Minkoff et al. (1987a)

found that only four of a sample of 34 mothers of infants with AIDS or ARC had conditions during pregnancy that could be associated with HIV infection.

The effect of HIV infection on pregnancy outcomes is also of importance to women. A major adverse pregnancy outcome is the significant risk of perinatal transmission of HIV infection previously discussed (CDC, 1985b). Minkoff et al. (1987a) retrospectively studied the pregnancies of the mothers of 34 infants with AIDS or ARC. They found that study infants had lower birthweights than their older siblings, with approximately one third weighing less than 2500 grams at birth. Premature rupture of membranes was also common among these women. These findings suggest adverse fetal outcomes for infected mothers, but may also be explained by socioeconomic status factors in that approximately 80% of the women were either IVDU or Haitian immigrants.

#### Psychosocial Issues

It is clear from the previous discussion that the AIDS epidemic poses a serious threat to physical health. A complete review of the phenomenon of AIDS, however, must also include the effect of the disease on psychosocial health.

A person diagnosed with HIV infection faces a number of serious psychological and social issues (Donlou, Wolcott, Gottlieb & Landsverk, 1985; Hauer, Laurencin, & Pies, 1987). These are:

- having contracted an incurable and infectious disease that poses a threat of death at an early age;

- having a condition associated with a socially stigmatized lifestyle such as homosexuality or illicit drug use;
- the actual emergence of debilitating clinical symptoms;
- decisions regarding what to tell lovers, friends or family members about the illness and/or the lifestyle;
- possible changes in career goals or family, social, and sexual relationships;
- loss of resources such as jobs or health insurance;
- lack of social or medical services;
- loss of friends due to death;
- discrimination against persons with HIV infection because of lifestyle choices, assumptions about lifestyle, or the disease itself.

These psychosocial stressors elicit a variety of emotional responses depending on the individual's resources, personality, and disease status. Available literature is largely based on research or clinical experience with gay or bisexual men diagnosed with AIDS or ARC (Donlou et al., 1985; Morin & Batchelor, 1984). Study findings and clinical observations with these populations confirm the existence of profound emotional and psychological effects on the lives of persons with AIDS or ARC. Among these are dementia, mood disturbances, depression, low self-esteem, decreased social interactions, illness-related stress, anger and shame.

Although these psychosocial issues would have a similar impact on women with HIV infection, there are further considerations that

infected women face (Macks & Maier, 1987; "Women at Risk", 1987).

These include:

1. Childbearing/childrearing issues. As described earlier, a woman with HIV infection has a 40% to 65% chance of transmitting the virus to a fetus in utero. Consequently, a woman who desires children must face a decision to forego pregnancy entirely or risk transmitting the virus to her baby. Furthermore, an asymptomatic woman with HIV infection may progress to a symptomatic status where she would be unable physically or emotionally to care for her children. A woman in this situation would then be faced with the realization that her premature death would leave them either with one parent or alone.

2. Other family issues. Macks and Maier (1987) observed in their work with 26 women with AIDS or ARC in San Francisco that these women often placed the health needs of other family members above their own. This resulted in later diagnosis and/or treatment, as well as the stress of caring for other family members' illness while ignoring their own disease.

3. Isolation. A woman with HIV infection has a condition that is regarded in this country as a male disease. This invisibility can foster a sense of unreality or denial in the woman. It also leads to lack of support services designed to meet the needs of women for housing, financial assistance, and/or childcare.

4. Financial factors. Approximately 50% of women with AIDS contracted the disease because of IV drug use. Furthermore, over 80% of women with AIDS are either Black or Hispanic. Thus, infected women are a very different population from infected men. The economic disadvantages confronting minority women and those with a street drug lifestyle result in fewer financial resources for infected women to pay for medical care, housing, and childcare.

5. Pre-existing psychosocial factors. Macks and Maier (1987) observed that many participants in a support group for women with AIDS/ARC had a history of sexual or physical abuse and substance dependency as well as low self-esteem. The diagnosis of HIV infection could thereby exacerbate the other pre-existing psychosocial factors. For example, regarding IVDU, these factors could include: day-to-day survival issues, a sense of social alienation and expendability, and isolation due to severing of family ties.

6. Cultural factors. Psychosocial issues arising from the high number of women with AIDS who are Black or Hispanic could relate to cultural variables such as the relative importance of extended family ties or religious beliefs.

The psychosocial impact of AIDS reverberates beyond the ill individual. Family members, friends, and sexual partners of the person with HIV infection are seen to experience distress, grief, avoidance, and other painful emotional reactions to the diagnosis in a loved one (Morin & Batchelor, 1984).

Health care workers are not immune to the psychosocial stress associated with AIDS. In addition, health care workers, many of whom are women, are placed at some risk of exposure to the virus through accidental parenteral or mucous membrane exposure to HIV while caring for an infected person. This risk has produced much understandable anxiety and fear. Furthermore, health care or social service providers may find themselves overextended in trying to meet the multiple physical and psychosocial needs of persons with HIV infection (Morin & Batchelor, 1984; Poole, Fahrner, Hirdler, Maier, & Blackman, 1987).

#### Social Policy Concerns

Due to widespread concern about AIDS, public policy has been developed to guide appropriate response to the problem of HIV infection (Institute of Medicine, 1986; MacDonald, 1986). Controversy has arisen over many issues involved in public policy; the challenge is to protect the public health while respecting individual rights.

In broad terms, social policy concerns involve education, research, and services. Education of the public about AIDS is considered essential and will be discussed later. Although research about HIV infection has burgeoned since 1981, much remains to be done. Further research into the virology and immunology of HIV, the natural history and epidemiology of HIV infection, animal models and development of antiviral agents, medical treatments, and vaccines is needed. Research in the social sciences is also

necessary to design educational programs and assess their effectiveness, to understand sexual behavior and drug use, and to assess and respond to the psychosocial needs of persons infected with HIV. Essential services for infected persons include medical/nursing care, counseling, support groups, information and referral, respite care, dependent services, and housing (Institute of Medicine, 1986).

### Prevention

Because effective vaccine and drug therapies are not yet available, primary prevention is the only way to combat the spread of HIV infection. Public policy regarding prevention includes several components. Perhaps the most important is a nationwide educational campaign to inform the public about the facts of HIV infection and preventive measures. Although a consensus exists about the necessity of educational programs, there is controversy regarding their content. Some advocate a variety of options for sexually active persons including teaching safer sex practices. Others take a more conservative approach by advocating abstinence or monogamy as the only moral choices. Regardless, educational programs must be culturally sensitive and targeted for high risk groups as well as for the general public (MacDonald, 1986).

Recommendations for prevention involve minimizing the risk of transmitting the virus via contaminated body fluids. For sexually active women, adoption of "safer sex" practices will reduce the chance of infection. Specifically, "safer sex" avoids the exchange

of body fluids. This can be accomplished by the use of barriers during sexual activity to prevent exchange of semen, blood, or vaginal secretions. Laboratory tests have shown condoms to be impermeable to high concentrations of HIV and thus are being promoted as an important preventive measure (Conant, Hardy, Sernatinger, Spicer, & Levy, 1986). The use of condoms as a barrier has been linked to reduction of HIV transmission (Mann et al., 1987). Furthermore, Nonoxynol-9, a common spermicide, is known to kill HIV in vitro and may be used with condoms as protection in case of condom failure (Hicks et al., 1986). However, since testing of Nonoxynol-9 has been conducted only in vitro, current recommendations are that spermicide should not be used in place of condoms. Safer sex recommendations also include reducing the number of sexual partners, practicing abstinence, or having a mutually monogamous relationship (Koop, 1986).

For IVDU, infection can be avoided by ceasing street drug use, by not sharing drug injection equipment with other users, or by using effective needle cleaning procedures. Implementation of this recommendation involves making sterile, disposable needles and syringes readily accessible to IVDU as well as designing effective educational programs to reach a population often mistrustful of authority (MacDonald, 1986).

Transmission via the administration of infected blood or blood products can be avoided by continuing the policy implemented in 1985 of testing all donated blood for HIV antibody and requesting

that members of high risk groups refrain from donating (MacDonald, 1986). Pre-banking of one's blood prior to elective surgery is another way for non-infected individuals to reduce this risk (Mead et al., 1986).

For perinatal transmission, it is recommended that women in high risk groups be counseled about the risk of infecting a child. HIV antibody testing and first trimester abortion services would need to be available to support women's reproductive choices (CDC, 1985b).

### Testing

Another component of prevention is the availability since early 1985 of a reliable test for the HIV antibody (Liskin & Blackburn, 1986). There are several important issues involved: confidentiality, anonymity, sexual contact notification, and mandatory versus voluntary testing for certain groups. At present, the Public Health Service does not recommend widespread mandatory testing. In fact, Surgeon General Koop (1986) stated that "compulsory testing is unnecessary, unfeasible, and cost-prohibitive." Instead, persons in high risk groups are encouraged to be tested and to contact their past and present sexual partners if the test results indicate HIV infection (MacDonald, 1986). Counseling about the limitations of the test, the psychosocial effects of knowing one's antibody status, and preventive measures to minimize risk of transmitting or acquiring the virus is a

necessary component of any testing program (Goldblum & Seymour, 1987).

In conclusion, curtailing the spread of HIV infection at present relies on individual behavior changes that are encouraged and supported by public policy and funding. For women, especially those with known risk factors, this means adopting safer sex practices or changing drug use patterns to reduce the risk of infection. In addition, because of the large number of asymptomatic carriers, all women need to identify and reduce their risk of HIV infection.

#### Knowledge, Perceptions, and Behaviors

This section will review current research into knowledge, perceptions, and behaviors about AIDS. For convenience, the literature will be divided into studies with five groups: gay men, high school or college adolescents, mixed-gender adult population, IVDU, and women.

##### Homosexual Men

Studies with homosexual men reveal that this high-risk population is well-informed about AIDS and CDC recommended preventive measures. Calabrese, Harris, Easley, and Proffitt (1986) found a high majority of the sample of 305 gay men had knowledge of safer sex practices. Other research confirms these findings (CDC, 1985d; Handsfield, 1985; Schechter et al., 1984).

Several studies also provide evidence of risk-reduction behavior changes. A subset of 126 participants in the San

Francisco cohort study showed dramatic decreases in the number of nonsteady sexual partners and in the frequency of anal intercourse during the period 1978 to 1985 (CDC, 1987e). Further evidence comes from McKusick et al. (1985) who found substantial changes in reported high risk sexual behavior among 454 gay men, including a decrease in the number of partners and frequency of anal intercourse without condoms.

Although this data suggests that knowledge and high-risk behavior in gay men has changed, there is also evidence that unsafe sexual behavior persists. Two studies of sexual behavior in areas of low AIDS incidence showed low rates of consistent condom use. Studies in Ohio (Calabrese et al., 1986) and New Mexico (Jones et al., 1987) reported rates of regular condom use among gay men of 22% and less than 10% respectively.

#### Adolescents

Price et al. (1985) examined a convenience sample of 250 high school students' perceptions about AIDS. Students were found to have limited knowledge of AIDS with males appearing more knowledgeable than females. One hundred percent of females were found to be personally worried about AIDS, as compared to only 58% of males. The media was the primary source of information regarding AIDS; physicians were cited least often.

Strunin and Hingson (1987) studied the knowledge, attitudes, and behaviors of a random sample of 860 adolescents (16-19 years old) in Massachusetts. They found that adolescents knew that

transmission of AIDS occurs via certain body fluids; for example, 93% and 98% respectively identified blood transfusion and sex between men as a means of transmission. However, 60% and 37% respectively identified donating blood and sharing eating utensils as risk factors. They also found that 8% did not know that AIDS could be heterosexually transmitted. Although 55% said they were sexually active, only 15% had changed their behavior due to concern about AIDS. Of those, only 20% used effective preventive methods such as condoms or abstinence. Fifty-four percent reported not worrying at all about getting AIDS, with 61% thinking it not at all likely they would get AIDS in their lifetime.

Atkinson, Ktsanes, and Hassig (1987) randomly sampled by mail 967 college students in Louisiana whose mean age was 18.5 years. They found a high level of information regarding AIDS: over 90% were able to identify gay men and IVDU's as being at high risk for AIDS. However, 83% and 88% respectively believed that donating blood and being in class with a person with AIDS were means of transmitting AIDS. Eighty-six percent knew that avoiding IV drug use was a preventive measure and over 90% believed that abstinence or monogamy reduced their risk. Because of their knowledge about AIDS, 59% of the sample reported altering their sexual behavior either by their choice of sex partners or by decreasing the number of partners. There were no differences based on sex.

A survey of 1326 adolescents in San Francisco revealed varying knowledge about AIDS (DiClemente, Zorn, & Temoshok, 1986). Sexual

intercourse, sharing IV drug equipment, and transfusion with infected blood were identified as modes of transmission by 92%, 81%, and 84% respectively. Only 60% knew that condoms could be protective. Nearly 70% were unaware that casual contact was not a mode of transmission. Almost 75% indicated they were worried about contracting AIDS. A breakdown by sex of these results was not available.

#### General Population Surveys

A 1985 Gallup Poll (CDC, 1985c) sampled 2,586 adults and found a good level of awareness of AIDS and specific factors. For example, 80% knew that AIDS is not transmitted by handshaking and 84% knew that IVDU are at risk. This poll did not address perceptions or behaviors.

In a national random digit dialing poll of 1256 adults (Bausell, Damrosch, Parks & Soeken, 1986), participants were asked if they felt personally at risk for contracting AIDS and whether they took special steps to avoid infection. Results showed that 10% felt they were at risk. Forty-one percent indicated that they took special precautions to avoid AIDS, with higher percentages of Black, Hispanic, and persons under 30 years of age reporting precautions.

A study that included knowledge and behavior in a heterosexual population was a San Francisco telephone survey (Puckett, 1986). Respondents were asked to evaluate the impact AIDS has had on their sexual behavior on a scale of 1 to 10, with 10 indicating a high

degree of change. Two-thirds gave a rating of 5 or less, and 33% stated that AIDS has had no impact on their sexual behavior. Results about respondents' knowledge level were equally disturbing: only 7% knew that sex partners of high-risk persons were also at risk for HIV infection.

#### Intravenous Drug Users

In Sacramento, a study of 150 IVDU found a majority of the sample was aware of IV drug use and sexual intercourse as sources of HIV infection ("AIDS Awareness", 1987). While 95% believed they were at risk for HIV infection, they reported sharing needles 77% of the time. In fact, 87% had shared from 1 to 50 times in the previous month. Although 87% reported cleaning needles between users, the primary method of cleaning involved water alone.

A preliminary report on the effectiveness of a street-based AIDS prevention program revealed changes in needle-cleaning and sharing behavior among IVDU's in San Francisco (Watters, 1987). The percentage of IVDU's who reported "always" using a needle-cleaning procedure rose from 53% to 66% over a one-year period between 1986 and 1987. Of these, the use of "possibly safe" procedures (bleach, peroxide, etc.) rose from 37% to 76% over the same period. Watters also reported an increased use of safer sex practices, although to a lesser extent than safer IVDU practices. Although the effectiveness of this outreach program cannot be ascertained because there was no comparison group, these results do

underline the ability of persons at risk to make appropriate changes.

### Women

An unpublished survey of women's knowledge, attitudes, and risk of HIV infection was conducted in San Francisco family planning clinics by Oliva et al. (1987). The preliminary sample of 219 women had a mean age of 27 and was composed of 39.7% White, 32.4% Black, 10.5% Hispanic, 6.4% Chinese, 7.3% Filipina, and 3% other.

The primary sources of information were the media (64%) and health-related sources (21%). Knowledge level about AIDS varied, with 90% correctly identifying sex with a bisexual, sharing needles, having a blood transfusion, and perinatal transmission as routes of infection. In contrast, 41.8% did not know that heterosexual sex was a mode of transmission, and 25.6% did not think transmission was possible via sex with an IVDU. Furthermore, only 33% were able to identify two or more sexual practices as being high risk. For example, 90% thought sex without a condom was safe (Oliva et al., 1987). Women in this sample were also misinformed about casual contact as a source of infection; 31% thought sharing hot tubs was a mode of transmission.

In terms of personal behaviors, 37.1% reported one or more risk factors for HIV infection including IV drug use and/or sex with an IVDU or bisexual male. Although 76.6% agreed condoms were protective, 73.9% reported rarely or never using condoms. Other

risk reduction behavior changes were not evaluated by this study. Regarding perceived risk, 43% stated they were worried or very worried about acquiring HIV infection (Oliva et al., 1987).

#### Summary

The purpose of the majority of these studies was to assess current knowledge, attitudes, and behaviors in the target groups in order to develop appropriate educational interventions. As such, they are most often descriptive in design, and do not attempt to correlate variables. This is similar to the intent of the proposed research with women. Nevertheless, several methodological limitations make it difficult to generalize these findings to a study of women's knowledge, perceptions, and behaviors regarding AIDS. First, samples are composed of a variety of subjects: gay men, adolescents, or IVDUs. Where mixed-sex samples were used, a breakdown of results by sex was often unavailable. Second, although most of the studies had adequate sample sizes, samples were often non-random convenience samples, especially those concerned with behavior changes. Third, the behavioral research was often retrospective and relied on self-report and recall for data collection. Fourth, with few exceptions, confounding variables, such as the influence of media stories, that might influence results were not addressed in the research.

Despite these limitations, several conclusions can be drawn from the research as a whole. There appears to be a general public awareness of AIDS/HIV infection that crosses group boundaries. A

high degree of knowledge about risk groups and prevention measures is seen commonly. Risk of casual transmission is overemphasized by many of the samples. Preventive measures are well-understood in the samples of gay men, but less so in the adolescent and female samples. Perceptions were addressed infrequently, but there appears to be a certain level of anxiety or worry about contracting AIDS across groups. Behaviors regarding AIDS were studied in the most depth in the gay male samples. Results indicate that while some gay men have changed their behavior to reduce risk many continue to engage in risky sexual activity. This illustrates the difficulty of changing established patterns of behavior despite awareness of the severity of the disease and knowledge of recommended preventive measures. The observation that many gay men in areas of low AIDS prevalence persist in high risk behavior suggests that women, a low risk group in general, might show similar patterns.

The study by Oliva et al. (1987) provides a good basis for the proposed research. It had an adequate sample size, comprised of family planning clinic clients. As such, the sample could be biased towards lower socioeconomic status, but is racially mixed and consists of sexually active women whose mean age is 27. As with the other research, this sample had good knowledge of certain risk factors but not of others, including heterosexual sex, nor did most of the women take the precaution of using condoms despite the presence of risk factors in more than one third of the sample.

Clearly, there is a dearth of research regarding women's knowledge, perceptions, and behaviors regarding AIDS. The proposed study is thus both timely and appropriate.

#### Conceptual Framework

Control of AIDS involves the use of preventive measures by individuals to minimize the rate of transmission of HIV. However, preventive behaviors, particularly those requiring lifestyle changes, are notoriously difficult to implement and even more so to maintain. The Health Belief Model (Rosenstock, 1974) provides a theoretical basis for understanding the factors that influence the adoption of preventive health behaviors. The conceptual framework for the proposed research is therefore drawn from this model.

The Health Belief Model (HBM) was developed in the 1950's in an attempt to understand widespread failure to adopt disease preventive or health screening measures (Janz & Becker, 1984). The HBM proposed that several factors influence the likelihood a person will undertake preventive health behaviors. The components of the HBM are presented in schematic form in Figure 2 to demonstrate their interactive nature.

As seen in Figure 2, the HBM consists of four major factors. The first two are:

1. perceived susceptibility, the belief that one is at personal risk for contracting a particular disease or condition and;

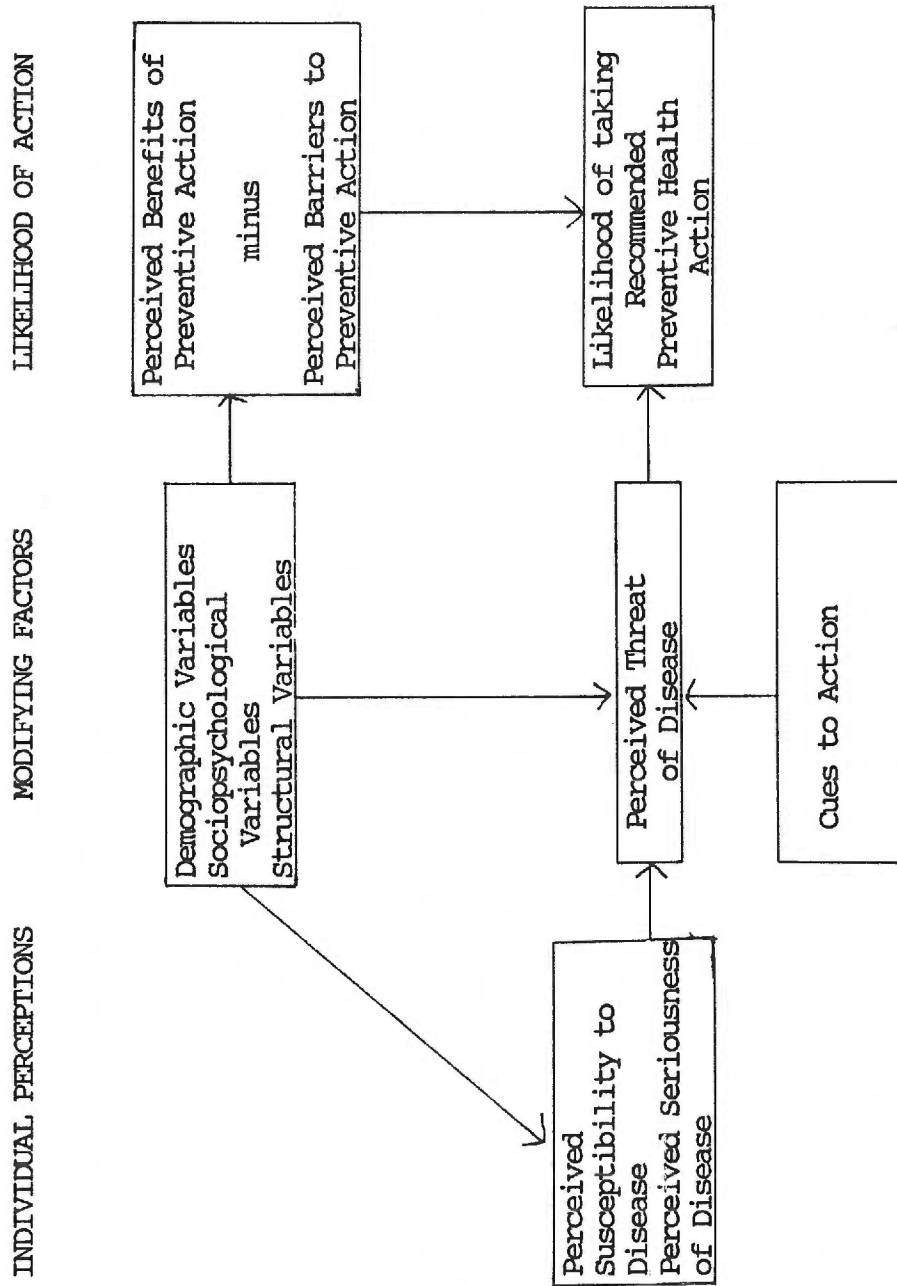


Figure 2. HEALTH BELIEF MODEL (Rosenstock, 1974)

2. perceived severity, the belief that a health problem can have serious consequences. Perceived severity is based on an evaluation of possible medical outcomes (pain, disability, death) and of possible social consequences (financial problems or changes in work, social and family relationships).

Together, perceived susceptibility and perceived severity contribute to the perceived threat of contracting the condition. Perceived threat is modified by the second two factors, which are:

3. perceived benefits, the belief that a particular course of action would be effective in reducing the perceived threat of a condition; and

4. perceived barriers, the belief that the course of action would be unpleasant, expensive, painful, or have other negative consequences.

The HBM specifies other factors that can modify the four major concepts to affect the likelihood of an individual's adoption of preventive health behavior. These factors include:

1. cues to action, factors that instigate the behavior, such as reminder notices, media stories, advice from others, or the illness of a family member or friend; and

2. demographic, sociopsychological, and structural variables. Demographic variables include age, sex, ethnicity, geographic location, and so on. Sociopsychological factors refer to personality, social class, or cultural values. Structural

variables include knowledge about the condition or prior contact with the condition through family or friends.

Since its development, the HBM has been tested empirically in a variety of studies about health behavior. Janz and Becker (1984) reviewed 29 investigations from the period 1974 - 1984 and summarized their results with those of HBM-related studies prior to 1974. Of the total 46 studies, 24 examined preventive health behaviors. Janz and Becker found there was substantial support for the ability of the HBM to predict adoption of preventive health behaviors, with findings from three prospective studies at least as significant as those from 21 retrospective studies.

Without exception, the preventive health behavior studies found perceived barriers to be related significantly to adoption of preventive health behaviors. Slightly more than 80% found that perceived susceptibility and perceived benefits were also predictive. In contrast, only 36% of the studies reviewed found perceived severity to be a significant factor in predicting preventive health behavior (Janz & Becker, 1984).

These findings lend support to the utility of the HBM in examining the factors that influence health behavior. However, several limitations are apparent in applying the HBM to the proposed research about AIDS. First, none of the studies explored sexually-transmitted diseases or sexual health practices. The studies included preventive health behaviors regarding influenza, Tay-Sachs disease, breast cancer, and outcomes of smoking, seat

belt use, and personal hygiene. The factors that distinguish HIV infection from these conditions could alter the predictive strength of the HBM components. Specifically, these factors include the social stigma of AIDS, the threat of a debilitating disease followed by death at an early age, and depletion of financial resources.

An additional limitation of the HBM arises from the diverse approaches to measuring the HBM variables between studies. This restricts the ability to compare the findings of this study to those of other HBM-based investigations.

According to Janz and Becker (1984) a further limitation of the HBM is that it only accounts for "as much of the variance in individuals' health-related behaviors as can be explained by their attitudes and beliefs" (p.44) towards a condition or disease. Theory and research outside the context of the HBM suggests other variables that might affect health behavior. Pender (1984) lists several factors that have received tentative support in nursing research. These include health value, perceived health status, self-esteem, perceived control, social support, and expectations of significant others. Ajzen and Fishbein (1980) explore the influence of social approval or disapproval on behavior, a concept that could be extended logically to health practices. Bandura's (1977) concept of self-efficacy, the belief that one has the ability to undertake and maintain a particular course of action, may also be an important influence on preventive health behavior.

Finally, Champion (1984) suggests that health motivation, a concern about general health matters that results in willingness to seek and comply with positive health activities, is also a component of preventive health behavior. The HBM accounts for these and other potentially influential concepts by including them in the "modifying factors" category (see Figure 2). Nevertheless, research has not yet linked the four basic HBM concepts with these modifying factors.

In the context of the proposed research regarding women and AIDS, the HBM predicts that women who perceive themselves to be at risk for AIDS will be likely to adopt preventive behaviors. Women who perceive that the benefits of adopting preventive practices outweigh the perceived barriers will also be likely to institute such measures. The role of perceived severity is more problematic. HBM-related studies show less correlation between this variable and the adoption of preventive behaviors. Because HIV infection poses grave consequences to a woman's health, reproductive capacity, and sexual lifestyle, the perceived severity variable may assume greater importance in this study.

The likelihood of a woman taking preventive health actions based on her perceptions about AIDS may be affected by modifying factors. These factors could include the media publicity regarding AIDS or having a friend contract AIDS. Lack of basic knowledge regarding transmission of HIV or of personal risk factors could impede a woman from adopting preventive measures. Furthermore, it

is possible that a woman's response would be affected by personal, social, and cultural factors as well.

This study will limit measurement of components of the HBM to knowledge level, sources of information, and perceived personal susceptibility. Consequently, the HBM will not be used to predict the adoption of preventive health measures among women regarding AIDS. However, if possible, correlations between reported perceptions, knowledge levels, and behaviors will be made.

#### Research Questions

The following research questions evolved from an examination of women and AIDS within the context of the HBM:

- (1) What do women know about AIDS?
- (2) What are women's primary sources of information for AIDS?
- (3) What are women's perceptions regarding their personal susceptibility to AIDS?
- (4) What AIDS risk reduction behavior changes do women report?

## CHAPTER III

### Methods

This chapter will describe the methods used to gather data from a sample of college women regarding their knowledge about AIDS, perception of personal susceptibility to AIDS, behavior, and primary sources of information. The design, sample and setting, instrument, research procedure, and analysis will be explained.

#### Design

The study design is primarily descriptive with some initial investigation of the relationships between knowledge, perception of personal susceptibility, and behavior of women regarding AIDS. Specifically, this study entailed the administration of a questionnaire to a sample of female students at a local university. The selection of a non-experimental design was mandated by the current lack of literature in the area. Within this context, a descriptive study will contribute to the development of a knowledge base which may ultimately facilitate a more comprehensive approach to women's health care.

#### Sample and Setting

Participants for the study were drawn from a convenience sample of women attending health education classes at an urban university. The decision to survey female college students reflected the assumption that this population would likely include women who are sexually active and therefore potentially at risk for AIDS. The health education class was chosen because it is a

required course for all graduating students. Consequently, the class was assumed to offer a representative subset of the student body. To avoid contamination of the sample due to class discussion of sexually transmitted diseases, the questionnaires were distributed on the first day of class.

#### Instrument

A questionnaire was specifically designed for this study (see Appendix A). The content was drawn from tools developed for two previous studies (Puckett, 1986; Oliva et al., 1987) and was based conceptually on the HBM. The instrument was a self-report questionnaire concerning the respondents' knowledge, perception of personal susceptibility, and behaviors regarding AIDS. The use of a self-report questionnaire about AIDS allowed each participant to provide sensitive information privately and anonymously.

An additional component of the questionnaire development involved consultation with local experts regarding content and construct validity of the tool. Feedback on clarity of language used, length, redundancy, missing options, and informed consent was obtained and minor revisions such as adding questions about lesbian women, were made accordingly. Reliability of the self-perceived risk scale was determined using the coefficient alpha method.

The questionnaire was structured to start with items which were not personal or threatening in nature. Consequently, factual questions on knowledge about AIDS preceded questions on perceptions of personal susceptibility and behavior changes. The items on

demographics and risk factors were listed last. The questions were phrased in a non-judgmental tone to minimize risk of bias.

Questions 1-18 measured knowledge about AIDS including transmissibility, testing, risks associated with specific behaviors, and safer sex practices. Participants responded to the knowledge items by circling options such as true, false, and don't know. Each correct answer was scored as one point yielding a maximum score of 18; incorrect and don't know responses were scored as zero.

Items 19-26 referred to sources of information on AIDS. Participants identified their sources of information from a list that included media, publications, health providers, and friends/relatives. Participants were then asked to indicate which source was the most helpful.

Items 27-30 provided a score for each participant's perception of personal susceptibility to AIDS. Responses were measured using a Likert-type scale. The maximum score obtainable was 20, indicating the highest degree of self-perceived risk. The lowest score possible was 4, indicating no self-perceived risk.

Items 31-41 addressed women's preventive behaviors regarding AIDS. Therefore, participants chose from a list of sexual and IV drug use risk reduction behaviors. A positive response to items 31-36, 38, 39, and/or 40 indicated recommended risk reduction behavior changes. A positive response to item 37 revealed participants who reported no behavior changes due to personal

assessment of risk status. Item 41 allowed the participants to describe "other" behavior changes not listed above.

Questions 45-49 identified characteristics that allowed the investigators to assess risk factors among women in the sample. These items included sexual and drug use history, and history of blood transfusion and artificial insemination between 1978 and 1985. One or more positive responses indicated that the woman was possibly at increased risk for AIDS. Participants with no positive responses were considered to be at low risk for AIDS.

Items 42-44, and 50-56 included demographic data as well as other variables that could influence interpretation of results. For example, participants were asked to indicate if they personally knew someone with AIDS and if they had taken the AIDS antibody test. Demographic information included race, age, sexual preference, and relationship status.

#### Research Procedure

The research procedure was as follows:

(1) The investigators attended the first day of all five health education classes taught spring quarter at an urban university. Following the instructor's presentation, the investigators were introduced to the class as OHSU graduate students. The investigators then made an announcement to the class regarding their thesis study on women and AIDS. Students were informed that the purpose of the study was to learn what college women knew and felt about AIDS and that, accordingly, participation

was limited to the female students. It was explained that participation was voluntary and anonymous and entailed the completion of a questionnaire. The investigators emphasized that the decision regarding participation did not influence their course standing in any way.

(2) Envelopes containing both a cover letter (informed consent) and questionnaire were distributed by the investigators at two designated exits as students left the class. The informed consent (see Appendix B) specified the voluntary, confidential, and anonymous nature of the study as well as the benefits and the risks of participation. The benefits included helping to develop information about women and AIDS and participants learning more about AIDS through an informational handout distributed by the researchers at a later class. The only identified risk was the potential for the topic to cause anxiety among participants. The cover letter also requested that participants mail back the tool within one week. Nearly all female students took a questionnaire; a total of 221 were distributed.

(3) One unanticipated step in the research procedure included the distribution of a brief summary of the study results and information about community resources to each of the health education classes. This modification occurred in response to the generally high level of interest in the study expressed by both students and faculty.

## CHAPTER IV

### Results

In this chapter, the findings of the study will be reported. First, the sample will be described. Second, the findings relevant to the four research questions will be presented. Lastly, analysis of relationships between selected variables will conclude the chapter; the accepted level of significance is  $p < .05$ .

#### Analysis of Data

Data were analyzed using the CRUNCH statistical package and guided by the research questions. The majority of the analysis involved descriptive statistics regarding the demographics, risk factors, knowledge, sources of knowledge, perceptions of personal susceptibility, and behavior changes regarding AIDS. Specifically, frequency distributions, measures of central tendency, and variability of the above factors were employed to address the research questions. Risk factors, perceptions of personal susceptibility, knowledge level, sources of knowledge, and behavior changes were compared to identify possible relationships (Table 3).

#### Description of the Sample

The sample included 128 women for a return rate of 58%. Participants ranged in age from 18 to 60. The mean age was 27.5 and the median age was 24.0 years. One hundred fifteen (91%) of the sample were White; of the remainder, three (2%) were Black, eight (6%) were Asian, and one (<1%) was Native American.

Table 3.

Data Analysis

Variable 1	Variable 2	Test
Self-perceived risk	Knowledge Level	Correlation
	Behavior Changes	T-test and Correlation
	Investigator-Assessed Risk	T-test
Knowledge Level	Number of Sources	Correlation
	Most Helpful Source	ANOVA
	Behavior Change	Correlation and T-test
	Investigator-Assessed Risk	T-test
Behavior Change	Most Helpful Source	Chi-Square
	Investigator-Assessed Risk	Chi-Square

The majority of women (83%) reported their sexual preference to be men only. Six (5%) and one (<1%) participants respectively identified women only and men and women as their preferred sexual partners. Fifteen women (12%) reported never having been sexually active. Ninety-one women (72%) reported their current relationship status as being mutually monogamous. Thirty-three (26%) reported

they were not sexually active at this time, while three women (2%) indicated current relationships with multiple partners.

The reported number of male sexual partners within the last two years ranged from 0 to 12. Nearly 20% reported no male partners in this time period, 61% reported one or two male partners, and 7% reported more than five male partners. Of the eight women reporting female sexual partners within the past two years, six had remained with one partner. The other two women in lesbian relationships reported three and four partners each.

Less than 10% of the sample reported personally knowing someone either with AIDS, ARC, or a positive HIV antibody test result. However, 49% reported knowing someone at risk for AIDS. When asked if they had taken the HIV antibody test, 21 (17%) indicated having done so. Seven (33%) of these women noted that they had been tested in conjunction with donating blood for the Red Cross.

Questions 45-49 allowed the investigators to assess risk factors for AIDS among women in the sample. No women reported a personal history of sharing IV drug injection equipment since 1978 or of having had artificial insemination between 1978 and 1985. Eight (6%) and nine women (7%) respectively reported a history of a bisexual partner or an intravenous drug using (IVDU) sexual partner since 1978. Of these, three women reported a history of sexual partners in both categories. Lastly, four women (3%) indicated a history of a blood transfusion between 1978 and 1985. Altogether

18 women (14%) reported at least one factor that placed them at increased risk for HIV infection.

### Description of Results

Knowledge. Questions 1-10 measured knowledge about the risk of HIV infection associated with specific behaviors. Participants rated these questions on a six point likert-type scale of risk from no risk to very high risk. As seen in Table 4, there was a high degree of knowledge regarding high risk behaviors but not of low risk behaviors. For example, while 100% of the sample correctly identified sharing IVDU equipment as a high risk practice, only 27% knew that living in the same household as a person with AIDS was not a high risk behavior. Confusion also existed regarding sharing eating utensils, intimate kissing, using public rest rooms, and social kissing.

Questions 11-17 were true-false statements regarding general knowledge about AIDS and safer sex practices. Table 5 shows that over 92% of the sample answered each of these items correctly with the exception of the item concerning lesbian women's risk for AIDS. Nearly one-third of the sample were unclear regarding the risk of AIDS in lesbian populations.

The last knowledge question concerned the meaning of a positive HIV-antibody test result; 86% correctly responded that the person probably had the AIDS virus in their body and may or may not

Table 4.

Ratings of Transmission Risk for HIV Infection Associated with  
Selected Behaviors (n=128)

	Very High Risk	High Risk	Mod. Risk	Low Risk	Very Low Risk	No Risk	% Correct
Social kissing	---	---	6%	13%	23%	<u>57%</u>	57%
Intimate kissing	4%	17%	22%	12%	<u>27%</u>	19%	27%
Unprotected sex with a bisexual man	<u>83%</u>	<u>14%</u>	<u>2%</u>	<1%	---	---	99%
Sharing drug injection equipment	<u>95%</u>	<u>5%</u>	---	---	---	---	100%
Using public rest rooms	---	2%	6%	14%	30%	<u>48%</u>	48%
Unprotected sex with IVDU	<u>83%</u>	<u>14%</u>	<u>2%</u>	<1%	---	---	99%
Sharing eating utensils with a PWA	9%	13%	11%	15%	29%	<u>23%</u>	23%
Receiving a blood transfusion <u>today</u>	3%	14%	21%	23%	<u>28%</u>	11%	28%
Transmission during pregnancy	<u>75%</u>	<u>20%</u>	<u>4%</u>	---	<1%	---	99%
Living with a PWA	2%	7%	13%	20%	32%	<u>27%</u>	27%

Note. IVDU = Intravenous Drug User; PWA = Person with AIDS.  
 Correct answers are underlined.

Table 5.

Responses to General Knowledge Questions (n=128)

	True	False	Don't Know	% Correct
Using condoms during sex can lower the risk of getting AIDS.	<u>98%</u>	2%	---	98%
AIDS is a disease that causes the body to be unable to fight off infections.	<u>98%</u>	---	2%	98%
Only gay men can get AIDS.	---	<u>100%</u>	---	100%
Learning more about a sexual partner's background is one way to reduce the chance of getting AIDS.	<u>94%</u>	2%	4%	94%
AIDS is curable.	---	<u>92%</u>	8%	92%
Long-term mutually monogamous relationships (where no other sexual partners are involved) are at lower risk for AIDS infection.	<u>95%</u>	2%	3%	95%
Lesbian women who do not use IV drugs are not at risk for AIDS.	12%	<u>66%</u>	23%	66%

Note. Correct answers are underlined.

get AIDS. Of the remainder, 7% thought it meant the person had AIDS or would certainly get AIDS, and 7% did not know the meaning of the test.

A total knowledge score with a possible range of 0-18 was computed for each respondent. A score of 18 would indicate that all items were answered correctly. The obtained scores ranged from 8-17 with a mean score of 13.4 and a standard deviation of 1.8. The median score was 13. Thus, the average respondent answered only 72% of the questions correctly.

Sources of Information. Items 19-26 referred to sources of information on AIDS. Participants identified their sources from a list that included media, publications, health care providers, and friends/relatives. Participants also identified which source was the most helpful. As seen in Table 6, the two most frequently reported sources were TV/radio (89%) and newspapers/magazines (83%). These two categories were also found to be the most helpful sources overall, with 45% choosing one or the other. Ninety-eight percent of the sample reported at least two sources of information; the mean number of sources indicated was 3.6. The range in number of sources was from 1-8. All women reported at least one source of information; 28 women did not underline a most helpful source.

Four women cited other sources of information; these included films, books, a press conference, and the 1986 Oregon Nurses Association House of Delegates Resolution. Three indicated the "other" category as their most helpful source.

Table 6.

Sources of Information About AIDS and Most Helpful Source of Information

	Source of Information	Most Helpful Source
TV/radio	90%	26%
Newspapers/magazines	83%	21%
Pamphlets/posters on AIDS	59%	15%
Classes/workshops	22%	13%
Health care professionals	35%	12%
Friends/relatives	42%	5%
Medical/professional journals	20%	5%
Other	3%	3%

Perceptions of Personal Susceptibility. Items 27-30 measured self-perceived risk for AIDS. Potential scores ranged from 4-20, with 20 indicating the highest degree of self-perceived risk for AIDS. Actual scores ranged from 4-19, with a mean of 7.0 and a median score of 6.0. Seventy-three percent had a score of 8 or less; the most frequently obtained scores were 4 and 5, indicating a generally low self-perceived risk. Cronbach's alpha was computed at .76 for these four items.

Reported Behavior Changes. Women's preventive behaviors regarding AIDS were addressed by items 31-41. Respondents were asked to choose from a list of recommended sexual and IVDU risk reduction behaviors. Of the sample, 46% reported no behavior changes due to AIDS. The two most frequently reported behavior changes were "became monogamous" (33%) and "decreased number of partners" (30%) (see Table 7). Sixteen women (13%) indicated "other" behavior changes that included: marriage, learning more about AIDS, using body fluid precautions at their workplace, and avoiding blood transfusions.

Additional Comments. At the end of the questionnaire, space was provided for women to write in additional comments. Fifty-six women responded; in general, their statements expressed a positive reaction to the study and an interest in knowing the results. Other comments included: requests for more information on community resources, concern about potential routes of transmission such as insects or drinking fountains, and expressions of personal concerns regarding past sexual partners. There were no indications that the participants found the personal nature of the content threatening or offensive.

Relationships between variables. Data analysis also included examining possible relationships between selected variables (see Table 3). Correlations were obtained between self-perceived risk, total knowledge score, total number of behavior changes, and total number of sources of information (see Table 8). Two statistically

Table 7.

Reported Risk Reduction Behavior Changes


---

Became monogamous	33%
Decreased number of sexual partners	30%
Asked partners about sexual history or high risk behaviors	16%
Started consistently using condoms	7%
Became celibate	6%
Stopped swallowing semen during oral sex	3%
Sought sexual partner with negative AIDS-antibody test result	2%
Stopped using intravenous drugs	--
Stopped sharing needles during intravenous drug use	--

---

significant correlations were found: self-perceived risk scores varied directly with total number of behavior changes (Pearson's  $r=0.45$ ,  $p<.001$ ), and total number of behavior changes varied directly with total number of sources of information (Pearson's  $r=0.24$ ,  $p<.01$ ). Thus, the greater the self-perceived risk score, the greater the number of behavior changes and vice versa.

T-tests were conducted between self-perceived risk and investigator-assessed risk, self-perceived risk and reports of at least one behavior change, total knowledge score and reports of at

Table 8.

Matrix of Pearsonian Correlations of Selected Variables

	SUSPSCOR	KNOWTOT	BEHAVTOT	NUMSOURC
SUSPSCOR		-0.09	0.45*	0.11
KNOWTOT			0.09	0.08
BEHAVTOT				0.24**
NUMSOURC				

Note. SUSPSCOR = Self-perceived Risk Score;  
 KNOWTOT = Total Knowledge Score;  
 BEHAVTOT = Total Number of Behavior Changes;  
 NUMSOURC = Total Number of Sources of Information.

\* $p < .001$  \*\* $p < .01$

least one behavior change, and total knowledge score and investigator-assessed risk. One significant result was obtained: women who reported at least one behavior change were found to have a significantly higher mean self-perceived risk score than women who reported no behavior changes (8.4 versus 5.9;  $p < .001$ ) (see Table 9). The mean self-perceived risk score for women with one or more investigator-assessed risk factors (8.2) was slightly greater than the mean score of women with no investigator-assessed risk (6.9), although the difference was not significant.

Table 9.

T-test Comparison of Self-Perceived Risk and Total Knowledge Score  
with Reported Behavior Change.

	<u>Behavior Change</u>		
Variable	None N=68	At Least One N=60	t value
<hr/>			
<u>Self-Perceived Risk</u>			
Mean	5.88	8.37	-5.35*
S.D.	2.16	2.97	
<u>Total Knowledge Score</u>			
Mean	13.28	13.45	-0.57
S.D.	1.81	1.75	

Note. \*  $p < .01$

Analysis of variance was applied to the total knowledge scores and the eight most helpful sources of information about AIDS. No significant relationships were found.

Chi-square was calculated for reports of one or more behavior changes and most helpful sources of information as well as for investigator assessed risk status and reports of one or more behavior changes. No significant relationships were found.

## CHAPTER V

### Discussion

This chapter will relate the findings of the study to the four research questions concerning women and AIDS. In addition, relationships between selected variables will be explored. The findings will be evaluated within the context of the preceding literature review and the Health Belief Model (HBM).

#### Sample Characteristics

The majority of the sample (N=128) of college women was White, in their 20's, heterosexual, currently in a mutually monogamous relationship, and at low risk for AIDS. Few women were personally acquainted with a person with AIDS, ARC, or a positive HIV-antibody test. Nearly half the sample reported knowing a person "at risk for HIV infection." However, the respondents were not asked to identify the factors that placed their acquaintances at risk, so it is difficult to interpret this finding. Less than a quarter of the sample had been tested for HIV-antibodies, possibly because the majority perceived themselves to be low risk.

A subset of women (14%) reported factors associated with an increased risk for AIDS, although their actual risk for AIDS cannot be determined accurately without a more complete assessment of the circumstances. No women reported a history of IVDU, the most common risk factor for AIDS found among women (Guinan & Hardy, 1987). Perhaps women with this risk factor were among those choosing not to participate in the study or perhaps they denied

drug use due to the social stigma associated with IVDU. Risk factors that were reported by the sample included a history of sexual contact with an IVDU, the second most common risk factor among women with AIDS. This finding that this group of women engaged in past behaviors associated with an increased risk for AIDS underscores the importance of risk reduction related to present and future behaviors among college women.

This sample differs markedly from samples used for similar research regarding knowledge, perceptions, and behaviors about AIDS. Other studies have used homosexual men (Calabrese et al., 1986; CDC, 1985d; Handsfield, 1985; McKusick et al., 1985; Schechter et al., 1984), mixed gender adolescents (Atkinson et al., 1987; DiClemente et al., 1986; Price et al., 1985; Strunin & Hingson, 1987), mixed gender IVDU ("AIDS Awareness", 1987; Watters, 1987), or mixed gender general population samples (Bausell et al., 1986; CDC, 1985c; Puckett, 1986). The only study regarding women exclusively (Oliva et al., 1987) sampled women attending a family planning clinic. That sample had a broader racial composition and a higher proportion of women reporting one or more risk factors for HIV infection than women in the present study. The study by Oliva et al. was also the only one reviewed that obtained an "objective" assessment of risk factors for the sample: participants were asked to report behaviors associated with an increased risk for HIV transmission such as IVDU. Consequently, the current study's sample of college women represents a population whose knowledge,

perceptions, and behaviors about AIDS have not previously been studied.

#### Research Questions

What do women know about AIDS? The average respondent answered only 72% of the knowledge items correctly. When the items concerning high and low risk transmission behaviors were separated, women were found to have a high degree of knowledge regarding high risk behaviors for HIV transmission, but could not discriminate low risk behaviors. Consequently, confusion about casual transmission lowered the average knowledge score. This finding is consistent with surveys of adolescents (Atkinson et al., 1987; DiClemente et al., 1986; Strunin & Hingson, 1987), IVDU ("AIDS Awareness", 1987), and women from a family planning clinic (Oliva et al., 1987). It is likely that this misunderstanding about casual transmission contributes to excessive or displaced public anxiety and discrimination against persons with AIDS. For example, some feel that school-age children with AIDS should be quarantined. The inability to identify low risk behaviors could also increase personal anxiety levels regarding contagion with HIV or motivate women to adopt unnecessary preventive measures such as avoiding public rest rooms.

The sample was well informed about safer sex practices and the natural history of AIDS, but not about lesbian women's risk for AIDS. This could reflect the current lack of literature regarding lesbian women and AIDS: no studies to date have focused

exclusively on this population. Other research has found similar results concerning general knowledge about AIDS among gay men (Calabrese et al., 1986), adolescents (Atkinson et al., 1987; Strunin & Hingson, 1987), the general population (CDC, 1985), and women (Oliva et al., 1987).

What are women's primary sources of information about AIDS?

The finding that the majority of this sample identified the media as their primary source of information about AIDS is consistent with other literature (Oliva et al., 1987; Price et al., 1985). In this study, about 10% cited health care providers as their most helpful source as did Oliva et al. (1987). The relatively low impact of health care providers as a source of information could be due to the fact that women are readily obtaining information from the media, that health care providers are not offering helpful education about AIDS, or that women are not seeking this information from health care providers, perhaps secondary to financial restraints. An alternative explanation may be that women in this age group, being generally healthy young adults, rarely see health care providers. Women in the present sample generally had multiple sources of information about AIDS. This may or may not reflect a sample motivated to seek information from various sources, but could simply be due to the prevalence of AIDS related stories in the media.

Analysis of variance failed to show a significant relationship between most helpful source of information and total knowledge

score. This could indicate that the various sources of information are similar in content and/or that no one source is more effective than another in educating women about AIDS. Alternatively, women's misinformation about the risk associated with casual transmission could be due to factors such as misinterpretation of news stories or distortion by word-of-mouth. Because most women had more than one source of information, their overall knowledge could be based on a personal synthesis of information from multiple sources.

Nearly 22% of the sample failed to identify a most helpful source of information. This could reflect misunderstanding of the instructions to underline the most helpful source after circling all sources used for information about AIDS. On the other hand, this response could indicate that no one source was felt to be most helpful.

The total number of sources of information was correlated with total knowledge score but the relationship was not statistically significant. It could be that once a basic knowledge level is obtained, increasing the number of sources does not necessarily increase knowledge.

What are women's perceptions regarding their personal susceptibility to AIDS? In general, respondents considered themselves to be at low risk for AIDS as reported on a four-item likert-type scale (Cronbach's  $\alpha = .76$ ). Mean and median self-perceived risk scores were 7.0 and 6.0 respectively; the range in scores was 4-19. A score of 20 would indicate the highest degree

of self-perceived risk while a score of 8 or lower was considered to indicate a low self-perceived risk. This finding is not surprising given that the sample displayed a high knowledge level regarding high risk behaviors and that relatively few women were found to be at increased risk via the investigator's assessment.

There is a wide range in self-perceived risk reported in other studies, from 100% of female adolescents being personally worried about AIDS (Price et al., 1985) to 10% of a general population surveyed by Bausell et al. (1986) feeling personally at risk for AIDS. These results are difficult to compare with the present sample because of different instruments used to measure this variable. Furthermore, extraneous variables, such as news stories at the time of the studies, could affect self-perceived risk.

Although the t-test comparison between self-perceived risk score means and investigator-assessed risk scores was not statistically significant, a trend toward higher self-perceived risk was noted for those with one or more investigator-assessed risk factors (see Table 9). This suggests that women's "subjective" assessment of their risk tends to vary with the investigators' "objective" assessment. Nevertheless, the mean self-perceived risk score (8.22) for women at increased risk was only slightly greater than 8.0, which represents the upper limit for low self-perceived risk scores. In other words, women who have known risk factors in their background do not perceive themselves to be at risk today, although they do perceive themselves to be at

slightly higher risk than women with no known risk factors. Possible explanations could be that they are no longer practicing risky behaviors, or that they are unaware of, denying, or have inadequate knowledge about how their past risk history relates to their current risk.

When total knowledge scores were compared to self-perceived risk scores, there was no significant correlation. This suggests that knowledge about AIDS by itself is not related to the degree of self-perceived risk. A number of other factors could contribute to a perception of low risk, such as not personally knowing a person with AIDS or overconfidence in the health of one's immune system.

What AIDS risk reduction behavior changes do women report?

Interestingly, slightly more than half of this low risk sample reported at least one preventive behavior change regarding AIDS. Of these behavior changes, reducing the number of partners and becoming monogamous were most frequently reported. Consistent condom use was reported by 15% of those reporting one or more behavior changes. Initially, these percentages seem high in relation to the relatively low risk profile of this sample, but behavior change could be due to other factors. For example, the mean age of this sample was 27, and women in this age group may tend to decrease their number of partners and/or become monogamous independently of concern about AIDS. Furthermore, self-reports of behavior change may reflect intended or ideal behavior, rather than actual behavior. This may be particularly true when discussing

sexual behaviors; monogamy may be more socially acceptable than multiple sexual relationships. Additionally, the social desirability response set bias may have influenced the sample's reporting of recommended behavior changes.

The relative lack of consistent condom use could be due to a number of factors. Specifically, women and/or their partners may be resistant to condoms because their use involves active commitment to AIDS risk reduction, or because of a perception that condom use would lessen sexual pleasure. Furthermore, women may deny that any partner of their choosing could pose a risk of HIV transmission.

There was evidence of confusion regarding the items on behavior change. For example, some women indicated that they had made no changes due to AIDS but also circled one or more behavior changes. This suggests that some behavior changes were made for reasons other than AIDS risk reduction. Consequently, this reduces the validity of the data obtained regarding behavior change.

Overall, studies of behavior changes regarding AIDS have reported varying results. Studies with gay men report significant risk reduction behavior changes (CDC, 1987e; McKusick et al., 1985). Studies addressing adolescents have found rates of reported behavior change ranging from 15% (Strunin & Hingson, 1987) to 59% (Atkinson et al., 1987). A national poll of mixed gender adults (Bausell et al., 1986) showed that 41% reported undefined "special precautions" to avoid AIDS, whereas two-thirds of a sample of

heterosexuals in San Francisco reported that AIDS had some impact on their sexual behavior (Puckett, 1986). The study by Oliva et al. (1987) of women attending a family planning clinic revealed that 26% reported using condoms occasionally or frequently.

Clearly, these studies demonstrate that preventive measures are being adopted to some degree. However, direct comparison of the preceding research with the current study is complicated by the relative lack of research about women and AIDS, the use of different methods, and divergent sample characteristics. For example, the sample in Oliva et al. (1987) included a higher proportion of women reporting one or more risk factors for AIDS than the present study sample.

Behavior change was compared to selected variables to examine possible relationships within the context of the HBM. Chi-square analysis between behavior change and most helpful source of information, and between behavior change and investigator-assessed risk, was not statistically significant. In addition, no significant relationship was found when total number of behavior changes was correlated with total knowledge score, nor when the presence or absence of behavior change was compared to total knowledge score means by t-test analysis. In contrast, similar analysis between behavior change and self-perceived risk scores revealed highly significant relationships by both t-test and correlation procedures. Another significant relationship was found

by correlating behavior change with total number of sources of information.

These findings describe relationships between variables that the HBM suggests are involved with the adoption of preventive health measures. Within the context of the HBM, perceived susceptibility to disease (self-perceived risk) is an integral component of the likelihood of taking recommended preventive health action (behavior change). Indeed, self-perceived risk was found to vary both with the total number of behavior changes and with the presence or absence of behavior change ( $p < .001$ ). According to the HBM, knowledge about a disease, sources of information, and demographic variables (including investigator-assessed risk) may influence the adoption of preventive measures. With the exception of total number of sources of information, these factors were not found to be significantly related to behavior change.

The finding that self-perceived risk and behavior change are significantly related is consistent with the HBM, and no alternative reasons for this result are readily apparent. However, the significant relationship between behavior change and total number of sources of information may be a function of health motivation in general; women who are motivated to adopt preventive measures may also be motivated to seek information from many sources, and vice versa.

The lack of a statistically significant relationship between behavior change and knowledge level was somewhat surprising. This

finding suggests that knowledge of risk factors for AIDS alone does not directly influence behavior change. Instead, knowledge may be interpreted selectively based on perceptions of personal susceptibility. Personal interpretations of knowledge may also explain why statistically significant relationships were not found between behavior change and most helpful source of information, or between behavior change and investigator-assessed risk.

Past research testing the components of the HBM has found that perceived susceptibility was related to the adoption of preventive health behaviors (Janz & Becker, 1984). However, research has not yet linked modifying factors to behavior change within the HBM (Janz & Becker, 1984). The findings from this study are generally consistent with other research using the HBM. Direct comparison with past studies is compromised by differences between both the sample characteristics and the health conditions being evaluated. Because this study is cross-sectional, it cannot support the ability of the HBM to predict the adoption of behavior change regarding AIDS.

## CHAPTER VI

### Conclusions

This chapter will summarize the problem statement, review of the literature, conceptual framework, methods, findings, and discussion of this study of women and AIDS. In addition, nursing implications, limitations of the study, and suggestions for future research will be identified.

#### Summary

AIDS poses a major health threat for which there is no vaccine or cure. Women are vulnerable to AIDS primarily through intravenous drug use (IVDU) with needle sharing and sexual contact with an infected partner. Special concerns of AIDS specific to women include family and reproductive issues.

The purpose of this study was to address the problem of prevention of AIDS among women by gathering descriptive data about their knowledge, perceptions of susceptibility, and behaviors regarding AIDS. A review of the literature revealed a lack of such studies; to date, research about prevention of AIDS has focused on homosexual men and IVDU. The Health Belief Model (HBM; Rosenstock, 1974), which describes factors involved in the adoption of preventive health measures, provided a conceptual framework for the study. Research questions based on selected HBM components were:

1. What do women know about AIDS?
2. What are women's primary sources of information about AIDS?

3. What are women's perceptions regarding their personal susceptibility to AIDS?

4. What AIDS risk reduction behavior changes do women report?

Due to lack of an appropriate tool, a questionnaire was developed specifically for this study. Data were gathered from a sample of 128 women enrolled in an urban university. The sample was primarily white, heterosexual, currently in a mutually monogamous relationship, and at low risk for AIDS.

The sample had a high degree of general knowledge about AIDS including high risk behaviors but overemphasized the risk of casual transmission. Women tended to report multiple sources of information about AIDS with the majority identifying the media as most helpful. Total knowledge about AIDS did not vary with the total number of sources of information. Women in the sample generally perceived themselves to be at low risk for AIDS, although an assessment by the investigators revealed a small number whose background included one or more high risk factors. Women with investigator-assessed risk factors tended to perceive themselves to be at slightly higher risk although this trend was not statistically significant. Women's self-perceived risk was not related to knowledge level but was significantly related to the presence of behavior change. Behavior changes most frequently reported were "becoming monogamous" and "decreasing the number of sexual partners." Fewer women reported consistent condom use or

asking about a partner's history as a behavior change. Behavior change was not related to knowledge or investigator-assessed risk.

In conclusion, these findings describe knowledge, perceptions of personal susceptibility, and behaviors about AIDS among a sample of college women. The major finding that perceived susceptibility was related to adoption of behavior change is consistent with the HBM.

### Limitations

1. The cross-sectional design of the study limited its ability to assess behavior changes. Respondents were asked to provide retrospective accounts of behavior change which is less reliable than longitudinal observation of behaviors.

2. The questionnaire was newly developed and had not been pilot tested prior to use. As discussed in Chapter 5, the confusion regarding items on behavior changes could have influenced the sample's responses.

3. The sample was relatively homogenous; consequently, caution must be used in generalizing the findings of the study to other populations of women.

### Nursing Implications

These findings have several implications for nurses. One is that nurses working with sexually active women need to focus on dispelling common misperceptions about casual transmission and reinforcing women's knowledge of high risk behaviors. In addition, nurses can offer information about lesbian women's risk for AIDS

when working with lesbian or bisexual women. The significant relationship between self-perceived risk and reported behavior changes in this study emphasizes the importance of accurate appraisal of personal risk, not only to identify when risk reduction behavior changes are needed but also when they are not. Such an approach could also allay anxiety and focus on appropriate preventive behaviors.

Nurses may want to question why health care providers are not considered a more helpful source of information about AIDS. Because women use the media as a primary source of information, nurses need to be aware of media content regarding AIDS. Additionally, nurses could work to ensure the quality of information presented by the media.

#### Recommendations for Practice and Research

The questionnaire developed for this study could serve as a clinical assessment tool to determine women's self-perceived risk for AIDS. Furthermore, the knowledge items could be used to evaluate women's understanding of AIDS. These assessments could guide nursing interventions in counseling sexually active women.

Recommendations for future research include replication of this study with other populations to build a data base about women's knowledge, perceptions of susceptibility, and behaviors regarding AIDS. Longitudinal studies would be helpful in assessing factors that influence women to adopt AIDS risk reduction measures as well as the usefulness of the HBM in predicting behavior change.

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APPENDIX A  
STUDY QUESTIONNAIRE

These first questions ask what you believe to be true about AIDS.

For the following, please indicate whether the chance of spreading the AIDS virus by each action is very high risk (VHR), high risk (HR), moderate risk (MR), low risk (LR), very low risk (VLR), or no risk (NR). Please circle your choice.

		Very High Risk	High Risk	Mod. Risk	Low Risk	Very Low Risk	No Risk
1.	Social kissing or "dry" kissing.	VHR	HR	MR	LR	VLR	NR
2.	Intimate kissing or "wet/French/deep" kissing.	VHR	HR	MR	LR	VLR	NR
3.	Having sex with a bisexual man without using condoms.	VHR	HR	MR	LR	VLR	NR
4.	Sharing needles or other drug injection equipment.	VHR	HR	MR	LR	VLR	NR
5.	Using public rest rooms.	VHR	HR	MR	LR	VLR	NR
6.	Having sex without using condoms with someone who uses IV drugs.	VHR	HR	MR	LR	VLR	NR
7.	Sharing eating utensils with a person with AIDS.	VHR	HR	MR	LR	VLR	NR
8.	Receiving a blood transfusion <u>today</u> .	VHR	HR	MR	LR	VLR	NR
9.	Passing the virus to an unborn baby when the mother is infected.	VHR	HR	MR	LR	VLR	NR
10.	Living in the same household with someone who has AIDS.	VHR	HR	MR	LR	VLR	NR

Please indicate whether the following statements are true (T) or false. Circle (DK) if you don't know.

	True	False	Don't Know
11. Using condoms during sex can lower the risk of getting AIDS.	T	F	DK
12. AIDS is a disease that causes the body to be unable to fight off infections.	T	F	DK
13. Only gay men can get AIDS.	T	F	DK
14. Learning more about a sexual partner's background is one way to reduce the chance of getting AIDS.	T	F	DK
15. AIDS is curable.	T	F	DK
16. Long-term mutually monogamous relationships (where no other sexual partners are involved) are at lower risk for AIDS infection.	T	F	DK
17. Lesbian women who do not use IV drugs are not at risk for AIDS.	T	F	DK

18. A positive blood test for AIDS antibodies means: (Circle one answer)

- a. The person has AIDS.
- b. The person will certainly get AIDS in the future.
- c. The person probably has the AIDS virus in their body and they may or may not get AIDS.
- d. The person cannot get AIDS.
- e. Don't know.

The next item refers to your sources of information about AIDS.

Please indicate which of the following sources you have used for information about AIDS by circling the appropriate number. Then, please underline the one most helpful source.

19. TV/radio
20. Newspapers/magazines
21. Medical/professional journals
22. Pamphlets/posters on AIDS
23. Health care professionals
24. Friends/relatives
25. Classes/workshops
26. Other, please name \_\_\_\_\_

These next questions ask for your opinions about AIDS.

For the following statements, indicate how you feel by circling SA (strongly agree), A (agree), U (undecided), D (disagree), or SD (strongly disagree).

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
27. My chances of getting AIDS are low.	SA	A	U	D	SD
28. My lifestyle makes it more likely that I will get AIDS.	SA	A	U	D	SD
29. I worry a lot about getting AIDS.	SA	A	U	D	SD
30. I feel I need to change my behavior to keep from getting AIDS.	SA	A	U	D	SD

This section concerns your personal behavior about AIDS.

What changes, if any, have you already made to prevent yourself from getting AIDS? (Circle all that apply)

- 31. Decreased number of sexual partners.
- 32. Started consistently using condoms.
- 33. Stopped swallowing semen during oral sex.
- 34. Stopped using IV drugs.
- 35. Stopped sharing needles during IV drug use.
- 36. Sought sexual partner who has negative AIDS antibody test.
- 37. I haven't made any changes because I don't think I'm at risk.
- 38. Became monogamous (my partner and I only have sex with each other).
- 39. Became celibate (stopped having sex).
- 40. Asked partners about sexual history or high risk behaviors.
- 41. Other, please name \_\_\_\_\_

This final section asks some personal questions about your background.

- 42. What is your relationship status at this time? (Circle one)
  - a. My partner and I have sex only with each other.
  - b. I don't have sex with more than one person but my partner does, or I think he/she might.
  - c. I have more than one sexual partner.
  - d. I am not sexually active now.
- 43. How many sexual partners have you been with in the last two years?  
Female \_\_\_\_\_ Male \_\_\_\_\_
- 44. Circle the statement that describes you best.
  - a. Have sex with men only.
  - b. Have sex with women only.
  - c. Have sex with men and women.
  - d. Have never had sex.

Please circle all that apply to you.

- 45. Have shared IV drug injection equipment at some time since 1978.
- 46. Have had sex with a bisexual man between 1978 and now.
- 47. Had a blood transfusion between 1978 and 1985.
- 48. Had sex with someone who used IV drugs at some time since 1978.
- 49. Had donor/artificial insemination between 1978 and 1985.

Do you personally know anyone who fits in the following categories?  
(Circle all that apply)

- 50. Has AIDS
- 51. Has AIDS-related condition (ARC)
- 52. Has a positive test result on AIDS antibody test
- 53. Is at risk for AIDS
- 54. Have you been tested to see if you have antibody to the AIDS virus?
  - a. Yes            b. No
- 55. What is your race? (Circle one)
  - a. White
  - b. Black
  - c. Hispanic
  - d. Asian
  - e. Native American
  - f. Other

56. How old are you? \_\_\_\_\_

Comments \_\_\_\_\_  
\_\_\_\_\_

That's it!!!! Thank you very much.

APPENDIX B  
INFORMED CONSENT

## Oregon Health Sciences University

## CONSENT FORM

We are graduate students from the School of Nursing at the Oregon Health Sciences University. This questionnaire is part of a study we are conducting on women and AIDS under the direction of Dr. Carol Howe. The purpose of this study is to find out what women think and feel about this new disease. We are inviting women to participate by completing this questionnaire; we estimate it will take about 20 minutes.

Your participation is completely voluntary and anonymous. Because we're not asking for your name, you can be assured that your answers will not be identified with you. To further protect your privacy and anonymity, we are asking you to take this home to complete and then return using the stamped envelope no later than April 5, 1988. By completing and returning this questionnaire to us, you are consenting to be part of the study.

The questionnaire will ask you to identify both what you know about AIDS and some of your feelings about women and AIDS. There will also be questions about your background and history.

Your participation will help us learn more about women and AIDS and may contribute to more effective ways of educating women about AIDS. After we receive your questionnaires, you will be given some information specifically about women and AIDS.

Your participation is not expected to involve any risk to you. Some women may be uncomfortable with this topic and may experience some anxiety from participating.

You are free to withdraw from this study at any time without jeopardizing your course grade or your relationship with Portland State University.

We are grateful for your assistance with our study. If you have any questions or concerns, please contact us at 279-8382.

Sincerely,

Susanne Buczala and Mary Garrard

If you experience problems that are the result of your participation in this study, please contact the secretary of the Human Subjects Research and Review Committee, Office of Grants and Contracts, 303 Cramer Hall, Portland State University, 464-3417.

### ABSTRACT

The purpose of this study was to gather descriptive data about the problem of prevention of AIDS among women in a sample of college students. Successful reduction of women's risk for HIV infection depends on educational programs based on an understanding of their knowledge, perceptions of personal susceptibility, and behaviors regarding AIDS. To date, research in this area has primarily focused on studies of homosexual men. This study addressed the following research questions:

- (1) What do women know about AIDS?
- (2) What are women's primary sources of information for AIDS?
- (3) What are women's perceptions regarding their personal susceptibility to AIDS?
- (4) What AIDS risk reduction behavior changes do women report?

The sample was drawn from students enrolled in required health education classes at a local university in a Pacific Northwest city. Data was gathered via a mail-back questionnaire constructed by the investigators. No other appropriate tool was available. The questionnaire addressed the respondents' knowledge, perceptions regarding personal risk, behavior changes, and risk factors for HIV infection. The Health Belief Model (Rosenstock, 1974), which described factors involved in the adoption of preventive health measures, also provided a framework for the content of the questionnaire.

The 128 respondents were primarily white, heterosexual, currently in a mutually monogamous relationship, and at low risk for AIDS. These women had a high degree of general knowledge about AIDS including high risk behaviors but overemphasized the risk of casual transmission. Women tended to report multiple sources of information about AIDS with the majority identifying the media as most helpful. Total knowledge about AIDS did not vary with the total number of sources of information. Women in the sample generally perceived themselves to be at low risk for AIDS, although an assessment by the investigators revealed a small number whose background included one or more high risk factors. Women with investigator-assessed risk factors tended to perceive themselves to be at slightly higher risk although this trend was not statistically significant. Women's self-perceived risk was not related to knowledge level but was significantly related to the presence of behavior change. Behavior changes most frequently reported were becoming monogamous and decreasing the number of sexual partners. Fewer women reported consistent condom use or asking about a partner's history as a behavior change. Behavior change was not related to knowledge level or investigator-assessed risk.

This study has several implications for nursing. Nurses working with sexually active women may need to focus on dispelling common misperceptions about casual transmission and reinforcing women's knowledge of high risk behaviors. The significant relationship between self-perceived risk and reported behavior

changes in this study emphasizes the importance of accurate appraisal of personal risk, not only to identify when risk reduction behavior changes are needed but also when they are not. In addition, nurses may want to question why health care providers are not considered a more helpful source of information about AIDS and work to ensure the quality of information presented by the media. Lastly, the questionnaire developed for this study could serve as a clinical assessment tool for both self-perceived risk and knowledge level.

Recommendations for future research include replication of this study with other populations. Longitudinal studies would also be helpful in assessing factors that influence women to adopt AIDS risk reduction measures as well as in exploring the usefulness of the HBM in predicting behavior change.