

Models of When in a Service Episode Youth will Undertake HIV Counseling and Testing

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Abstract

This paper examines factors related to the choice of a youth to test for HIV. Data are used from the service histories of 3,732 young people who received services in 10 national HIV/AIDS demonstration projects funded by the HRSA SPNS Program (HIV/AIDS Bureau). We examine the factors that predict the choice of testing and engaging in testing-related counseling and the time from enrollment with a service provider until testing is undertaken. Major behavioral risk factor typologies are related empirically to HIV testing-related services through regression models. Additionally, the same factors are related to the time during the services episode that the individual will choose to participate in HIV testing, pre- and post-test counseling, and risk assessments. Within the first few months of enrollment in the programs, more than 75 percent of all of the youth will have received testing from the project or will have been referred to an outside agency for HIV testing. The service provision rates for HIV testing show what may be expected as voluntary compliance with suggestions to test among a group of high-need youth receiving interventions from 10 projects especially designed to maximize these rates.

Models of When in a Service Episode Youth will Undertake HIV Counseling and Testing

Strategic HIV testing and counseling of young people at risk is an important safeguard because of the life-threatening nature of HIV disease, and its psychological, social, and legal ramifications. Pre-test counseling helps to educate those considering HIV testing about the real risks of HIV transmission, and reinforces behavior which can lead to risk reduction. For persons receiving news of a positive test, post-test counseling provides a safe place to react to their diagnosis and to begin a healthy adjustment to their altered life and connection to needed services (Hicks & Rundell, 1996). When testing adolescents for HIV infection, it is suggested that adequate pre-and post-test counseling and support be provided and that counseling and support services be designed to meet the diverse needs of young people at-risk (English, 1989).

There are many reasons that individuals choose to have an HIV antibody test, including illness and being in a known risk group (Phillips, 1993). Often it is not only the objective level of risk present, but the level of risk perceived by the individual (Irwin, Valdiserri, & Holmberg, 1996). Having more than one sex partner and never using a condom in the past year are strong predictors of taking an HIV antibody test (Samet, Winter, Grant, & Hingson, 1997); and having multiple sex partners has a strong effect on the decision to return for results (Miller, Hennessy, Wendell, Webber, et al., 1996). However, others have found no difference in risk levels between those who do and do not obtain HIV testing (e.g., Ickovics, Druley, Grigorenko, Morrill, Beren, & Rodin, 1998). In general, persons of color tend to obtain counseling and testing later in the course of the disease than do others (Wortley, Chu, Diaz & Ward, 1995). Men who have sex with men (MSM) who are older, non-white, with lower income, or not currently sexually actively are less likely to be tested, partially because they believe their risk of infection is too low

to justify testing and partially because they are fearful of learning the result (Campsmith, Goldbaum, Brackbill, Tollestrup, Wood, & Weybright, 1997).

Linkages to healthcare are strongly related to access to HIV counseling and testing. Adults who are connected to a healthcare system tend to also have access to HIV antibody testing (Mosen, Wenger, Shapiro, Andersen, & Cunningham, 1998). In addition, a study of young women in an obstetrical setting indicated that the time spent counseling each client and the individual HIV counselor were the best predictors of which women were most likely to test (Sorin, Tesoriero, & LaChance-McDullough, 1996).

Specific to young people, having the opportunity for anonymous testing appears to be an important factor in encouraging adolescents to seek HIV testing (Hertz-Picciotto, Lee, & Hoyo, 1996). There appears to be a gender difference in that young women are more likely to seek voluntary HIV testing, but of those who receive pre-test counseling, young men are more likely to actually follow through and obtain the HIV antibody test (Henry-Reid, Rodriguez, Bell, Martinez, & Peera, 1998).

Does the experience of HIV counseling and testing result in a reduction of HIV risk behaviors? Although some data suggest that counseling and testing can help to effect risk reduction (e.g., MacGowan, Brackbill, Rugg, Swanson, & Weisnstein, 1997), other research has not clearly identified the effectiveness of HIV testing or counseling for HIV prevention (e.g., Clark, Brasseur, Richmond, Getson, & D'Angelo, 1998). The counseling and testing process does allow, however, an opportunity for focused discussion with individuals about risk behavior (Norton, Miller & Johnson, 1997).

Young people with, or at high-risk for, HIV infection represent a broad spectrum of characteristics, risk behaviors, levels of care need, and service utilization patterns. Adult-oriented services have had difficulty addressing adolescents' needs for many reasons, such as a lack of services designed specifically for youth, the lack of knowledge by many health care providers about complex issues that young people face, and the lack of continuity in the care system. It has been found that a service delivery system that integrates a comprehensive array of services, emphasizes interagency coordination, and addresses the full range of services needs for youth at risk – including HIV counseling and testing – effectively recruits and retains young people in care (Bartman, Moy, & D'Angelo, 1997; Cohen, Mackenzie, & Yates, 1991; Resnick & Burt, 1996; Rogers, Futterman, Levin, & D'Angelo, 1996; Sullivan, 1996).

A National Demonstration Program for Adolescent HIV Care

Through its Special Projects of National Significance (SPNS) Program, the HIV/AIDS Bureau of the Health Resources and Services Administration (HRSA) funds national demonstration projects for HIV/AIDS services. In 1993, HRSA awarded 10 grants to projects targeting HIV/AIDS services to adolescents and young adults. These 10 projects were relatively heterogeneous in that their programs range greatly in scope and planned outcomes. Nonetheless, the 10 projects shared their target populations – specifically, adolescents and youth either already infected with HIV or at high risk to become so. A cross-cutting evaluation was developed to track the characteristics of the programs and their outcomes (Huba & Melchior, 1998).

As would be expected for a national services demonstration program, the 10 HRSA SPNS Program Adolescent Care Grantees vary greatly. However, the majority provides HIV counseling and testing services either directly, or through established linkages and referrals to test sites in the community. Descriptions of the 10 models are given in a special issue of the

Journal of Adolescent Health (see Huba & Melchior, 1998, and Woods, 1998). Each project approaches HIV counseling and testing from a slightly different perspective. The Boston HAPPENS program at Children's Hospital of Boston (Woods, Samples, Melchiono, Keenan, Fox, Chase, Tierney, Price, Paradise, O'Brien, Mansfield, Brooke, Allen, & Goodman, 1998), a comprehensive health services continuum, provides on-site HIV counseling and testing by project staff. The Division of Adolescent Medicine at Childrens Hospital Los Angeles (Schneir, Kipke, Melchior, & Huba, 1998) offers comprehensive health services, including on-site HIV counseling and testing. The TOPS Project of the Greater Bridgeport Adolescent Pregnancy Program (Feudo, Vining-Bethea, Shulman, Shedlin, & Burleson, 1998) is a Connecticut outreach project offering on-site HIV counseling and testing through a collaborating agency. Health Initiatives for Youth (Bourdon, Tierney, Huba, Lothrop, Melchior, Betru, & Compoc, 1998) is a San Francisco youth empowerment, advocacy, and leadership development program that refers youth to other agencies for testing services. The Indiana Youth Access Project of the Indiana Department of Health (Wright, Gonzalez, Werner, Laughner, & Wallace, 1998) provides outreach and social support services to gay and lesbian youth and offers HIV counseling and testing on-site and through an affiliated testing center. The project at the University of Alabama at Birmingham (Sturdevant, Kohler, Williams, & Johnson, 1998) provides outreach and education to disadvantaged, high-risk young women and has HIV counseling and testing available within the clinic. The University of Minnesota Youth and AIDS Project (Remafedi, 1998) provides HIV counseling and testing on-site, although verification of a positive HIV serostatus is a requirement for program enrollment. Walden House (Hymel & Greenberg, 1998), a residential substance abuse treatment-recovery program in San Francisco, provides pre- and post-test counseling, and links youth to HIV testing through an affiliated testing center. Project

PIE of YouthCare (Tenner, Trevithick, Wagner, & Burch, 1998), a Seattle program bringing services to runaway, homeless, and sexual minority youth where they congregate, provides counseling and testing referrals by project staff to an affiliated testing center. The project at Bay Area Young Positives (Bettencourt, Hodgins, Huba, & Pickett, 1998), a program run for and by young people living with HIV, works with youth once they know their HIV-positive serostatus.

In this paper, we examine the characteristics of the HIV testing-related services provided to youth served in these models of care and ask about the major ways that they are related to client characteristics. Statistical models are presented that determine the major typologies of services provided to youth. Although much of the research literature has focused on factors associated with HIV testing, the present study is unique in that it examines the sequencing of HIV counseling and testing services within the context of 10 national models of HIV care for adolescents and young adults. Questions addressed in this paper include not only how the characteristics of youth and their service involvement affect whether HIV testing services are received, but when, in a more general service episode, do young people access counseling and testing?

Methods

Cross-cutting evaluation instruments and design. The 10 projects agreed to participate in a cross-cutting evaluation of their activities.¹ The evaluation included five single-page forms that utilized a system allowing data to be transmitted via fax from project sites in the field to a central data computer (Huba, Brown, & Melchior, 1995; Huba & Melchior, 1995). The data presented here were collected using the Contact Form and the Intervention Form (Huba, Melchior, & the HRSA SPNS Program Adolescent Care Projects, 1994a,b). Contact Forms document demographic and other youth characteristics and patterns of HIV risk behaviors. These forms

may be completed in the context of outreach, program enrollment, or to change or update information previously documented for individuals served by the projects.² The analyses used to form the client characteristics indicators are presented in detail elsewhere (Huba, Melchior, Panter, Trevithick, Woods, Wright, Feudo, Tierney, Schneir, Tenner, Remafedi, Greenberg, Sturdevant, Goodman, Hodgins, Wallace, Brady, Singer, & Marconi, under review). Intervention Forms record services provided to an individual enrolled in care. Analyses used to form service intervention indicators are similarly presented elsewhere (Huba, Melchior, Woods, Panter, Feudo, Schneir, Trevithick, Wright, Martinez, Sturdevant, Remafedi, Greenberg, Tierney, Wallace, Goodman, Tenner, Marconi, Brady, & Singer, under review).

Typology of Client Behavior and Conceptual Model

Typology of client characteristics. In this paper, a number of client characteristics are used to predict utilization of HIV Testing Services. In addition to client demographics, HIV status, and the site at which the client received services, eight indices of HIV risk behaviors were included: Risky Sex with Men (representing a combination of any sex with males and unprotected sex with males), Risky Sex with Women (representing a combination of any sex with females and unprotected sex with females), Sex with an Injection Drug User (IDU), Survival Sex, Sex with an HIV-Positive Partner, having a Sexually Transmitted Disease (STD), Substance Abuse, and Injection Drug Risk (representing a combination of injection drug use and needle sharing; Huba, Melchior, Panter, Trevithick, Woods, Wright, Feudo, Tierney, Schneir, Tenner, Remafedi, Greenberg, Sturdevant, Goodman, Hodgins, Wallace, Brady, Singer, & Marconi, under review). Risk behavior indicators were dichotomous. For risky sex with men and risky sex with women, risk was coded as present if the youth was known to have ever engaged in

unprotected sex. For all other client behaviors, the risk was coded as present if the behavior had ever occurred.

Measures of HIV testing services. This paper examines six indicators of HIV Testing Services provided by the 10 Adolescent Care Projects. In the logistic regression analysis of what predicts utilization of HIV Testing Services, the dependent measure is defined as whether pre-test counseling, post-test counseling, an HIV antibody test, or a referral to HIV testing was provided. The dependent measure of receiving HIV Testing Services is coded if any of those four services were provided. In subsequent analyses, we examine the sequencing of pre-test counseling, post-test counseling, HIV testing, referrals to HIV testing, and HIV risk assessment services. Each service category is coded dichotomously as to whether or not it was provided, as well as the number of days from the first service intervention session until the HIV Testing Service was provided. In addition to these indicators, a composite was formed to examine whether HIV testing was provided either directly from the project or through a referral made by the project, and the number of days until either of these events occurred was coded.

Statistical models. A series of hierarchical planned setwise logistic regression models for studying utilization were used, as well as Cox regression analyses and Kaplan-Meier survival analyses for studying services sequencing. Logistic regression methods were used in a planned setwise way to study whether HIV testing was provided. Program retention was studied with Cox regression and Kaplan-Meier survival analysis methods. To differentiate these conceptually related methods, survival analysis is a way of looking at the curve of how many clients are retained in a particular state (in this case, in the state of being treated by the program) after a certain number of days. The resulting analysis is the “survival curve.” Fairly straight-forward techniques contrast whether clients of one kind or another tend to be retained in the program

longer. These methods are usually called “survival analysis” and the estimation method of Kaplan and Meier is the one typically employed, especially when there are a limited number of factors thought to influence program retention or survival. Cox regression, or event history analysis, may be thought of as an extension of survival analysis in which the tendency of the client to stay in the program is predicted from a number of factors considered simultaneously. In general, Cox regression is an analog to usual forms of multiple linear regression where the dependent variable is a time duration rather than a continuous variable, or in the case of logistic regression, a dichotomous dependent variable. In this paper we first present survival curves in the usual way using Kaplan-Meier analysis and then follow these analyses with Cox regression in order to test a more sophisticated model of the influences on time in program. The Kaplan-Meier analyses specifically do not correct for the differences among programs, while the Cox regressions do so by explicitly partialling out both the effects of being at a particular site and differences in the total number of intervention events.

To summarize the sequence of model tests made here for both the logistic regression and the Cox regression analyses, Table 1 shows the list and the order of the sets of variables that were entered. At each step, statistical tests were made to determine if the entry of that variable into the overall prediction equation sufficiently incremented the predictive power of the model. At each step, we determined the squared multiple correlation of the predictor and dependent variables and the incremental test for the regression. After determining which sets of predictors significantly incremented the regressions, we then looked at whether individual predictors in each set had statistically independent predictive power for each dependent variable.

 Insert Table 1 About Here

In both the linear and Cox regression analyses, regression coefficients are interpreted at each step. When a regression coefficient is presented, the model from which it is derived is that where all effects “above” it in the table have been included, but all effects lower in the hierarchy of entry (or “below” it in the table) have not been included. For example, the effects given for the demographic variables at Step 2 control for all prior effects at Step 1 (that is, the site and length of service episode) but do not control for the effects which will later be entered into the model at Steps 3, 4, and 5. Similarly, the effects at Step 3 control for effects at Steps 1 and 2 but not those at Steps 4 and 5. Note that for all analyses we do not present individual regression coefficients for specific sites because in this cross-cutting evaluation individual sites are not explicitly compared. For the Cox regressions examining the sequencing of HIV Testing Services, a seventh step was included to determine whether utilization of case management services had an effect on utilization of HIV testing and counseling services.

Participants. The data used for these analyses were collected between December 1993 and March 1998. The clients for these regression analyses were 1,710 young men and 2,022 young women who were enrolled in service programs of the 10 projects and for whom information about HIV risk behaviors was coded. Of the 1,710 young men, 329 were known to be HIV-positive. Of the 2,022 young women, 129 were known to be HIV-positive. The males were an average of 20.1 years of age (SD = 3.7 years) and the females were an average of 18.8 years of age (SD = 3.1 years) ($t(3715) = 11.65, p < .001$). In terms of ethnicity, 19.5 percent of the males were African American, 3.7 percent were Asian American, 47.4 percent were

Caucasian, 19.2 percent were Hispanic/Latino, 1.6 percent were Native American, 4.7 percent were multi-racial and 3.8 percent had an other or unknown ethnicity. Among the females, 24.6 percent were African American, 2.9 percent were Asian American, 44.9 percent were Caucasian, 18.5 percent were Hispanic/Latina, 1.4 percent were Native American, 5.0 percent were multiracial, and 3.3 percent had another or unknown ethnicity. Young men received a mean of 6.7 intervention services ($SD = 16.0$) and young women received a mean of 4.3 intervention services ($SD = 10.7$). Regression analyses are based on a sample of 3,732 complete cases.

Results

Who receives HIV counseling and testing services? A hierarchical logistic regression analysis of the effects of client characteristics on receiving such services was conducted. For this analysis, HIV counseling and testing services were defined as pre-test counseling, direct HIV testing by the project, post-test counseling, or referrals to HIV testing. Table 2 summarizes the logistic regression model examining who receives counseling and testing across the 10 projects. A total of 2,642 (70 percent) of the 3,372 clients received such services. Only statistically significant effects are listed in Table 2. There is a significant effect of site on receiving HIV counseling and testing. Controlling for site effects, receiving HIV counseling and testing is predicted by having an unknown HIV status, being Caucasian, or being Native American. At the next step, engaging in risky sex with men, risky sex with women, and having sexually transmitted diseases predicts who uses counseling and testing services. A lack of involvement in survival sex and not having had sex with an HIV-positive person also predicts the use of HIV counseling and testing services. The interaction of gender and risky sex is also statistically significant in that being female and having risky sex with men, being male and not having risky sex with men, being male and having risky sex with women, and being female and not having

risky sex with women, predicts HIV counseling and testing. Being male and having sex with an HIV-positive person, and being female and not having sex with an HIV-positive person, also predicts this outcome. Having an unknown HIV status and having had sex with an injection drug user predicts the utilization of HIV counseling and testing services from the projects. Criminal justice system-involvement and gender (female) also predicts this outcome.

 Insert Table 2 About Here

Overall, the analyses shown in Table 2 suggest that high-risk youth of either gender are the most likely to receive HIV services. This finding is neither startling nor unexpected, but it does speak to overall validity of the data used in the more sophisticated analyses that follow.

The Sequencing of HIV Counseling and Testing Services within an Episode of Treatment

A key issue is when HIV counseling and testing services occur during an episode of treatment. Using the data pooled across all 10 projects, we conducted a series of Kaplan-Meier survival analyses to determine the time at which different types of clients would typically receive various kinds of HIV counseling and testing services from the projects. Note that only individuals who received HIV counseling and testing services as defined in the previous regression analysis were included ($N = 2,642$). Figures 1 through 6 show how likely it is that a client would have failed to receive respectively HIV Pre-test Counseling (Figure 1), HIV Post-test Counseling (Figure 2), HIV Testing (Figure 3), Referrals to HIV Testing (Figure 4), HIV Risk Assessments (Figure 5), and HIV Testing or Referrals (Figure 6) by a given point in the involvement with the project.³ Consider first Figure 1. The two curves are for males and females. Even after being involved with a project for a period of several months, about one-third of these

clients will not have received HIV pre-test counseling. Figure 2 shows that post-test counseling tends to occur much later in the treatment episode. Figure 3 shows the percentage of clients not tested by a given time in their treatment episode, while Figure 4 shows the percentage not having received an HIV testing referral. Figure 5 shows the percentage of clients who have not received a risk assessment after a given number of days in the programs. Finally, Figure 6 shows the best measure of overall HIV testing productivity for the projects; the curve portrayed is the probability that the client has not been tested or referred to an outside agency for testing. Notice that virtually all clients receive such a service in their first few days in the programs.

In interpreting the median times to service and Figures 1 through 6, it is important to recognize that each of the youth included in these analyses received at least one of the HIV services, most typically at minimum a risk assessment or a referral to HIV testing.

Table 3 provides a summary of the Kaplan-Meier survival analyses of the time until receiving HIV counseling and testing services. The median time for HIV pre-test counseling to be provided to male and female clients was one day. HIV post-test counseling was provided to males, as well as females, within a median of 22 days. HIV testing was provided to youth within a median of one day, as were referrals to HIV testing and HIV risk assessments. Finally, HIV testing or referrals were provided to clients within a median of one day. Thus, most of the clients receive early referral to, or active provision of, that service.

 Insert Figures 1-6 About Here

 Insert Table 3 About Here

Corresponding to each of the Kaplan-Meier analyses in Figures 1 through 6, we also re-estimated the model using Cox regression so that we could study the time to receiving a service as a function of site differences, demographic and client characteristics, client behaviors, and various interaction terms. Table 4 summarizes the results of each of these analyses. Each column in Table 4 summarizes the results of a Cox regression predicting the time until receiving services in that category. At each step in the regression model, Table 4 shows the overall chi-squared value and significance level associated with that step in the analysis. Then for each specific indicator, a summary of the effects in the regression analysis is shown. If the indicator is a significant predictor of time until receiving the services, the values of the regression coefficient (B) and the standard error (SE) are shown along with the significance level. If the indicator is not a statistically significant predictor of time until receiving services, it is noted as “n.s.”

 Insert Table 4 About Here

For HIV Pre-test Counseling Services, project site and the number of service dates significantly predict the time until receiving services in this category. Above and beyond the effects of site and number of service dates, background characteristics also significantly predict the time until receiving HIV Pre-test Counseling. Clients of unknown HIV status tend to obtain HIV Pre-test Counseling sooner. There is no difference in how soon clients receive such services based on gender, age or ethnicity. Interactions between background characteristics also

significantly increment the prediction of how soon young people receive HIV Pre-test Counseling Services. Specifically, age (older) and unknown HIV status predicts receiving HIV Pre-test Counseling sooner. There are no differences based on the interactions between gender and age, gender and HIV status, HIV status and the number of service dates, or gender and the number of service dates. After controlling for these effects, client behaviors do not significantly increment the prediction of who gets HIV Pre-test Counseling Services sooner. There is no difference based on whether youth are known to have risky sex with men, risky sex with women, sex with an injection drug user, survival sex, sex with an HIV-positive partner, sexually transmitted diseases, substance abuse, or injection drug use risk. The interactions between both gender and HIV status with all eight client behaviors also do not differentiate how soon youth receive HIV Pre-test Counseling Services. However, other client behaviors significantly increment the prediction in that criminal justice system-involvement affects how soon youth receive pre-test counseling. The number of case management sessions and interactions between the number of case management sessions and gender, HIV status, and age do not significantly increment the prediction of when HIV Pre-test Counseling is provided.

In terms of HIV Post-test Counseling Services, project site and the number of service dates significantly predict the time until receiving services in this category. Above and beyond the effects of site and number of service dates, background characteristics also significantly predict the time until receiving HIV Post-test Counseling. Being older, of unknown HIV status, Asian American, and multiracial predicts receiving HIV Post-test Counseling sooner. There is no difference in how soon clients receive such services based on gender and being African American, Caucasian, Hispanic, or Native American. Interactions between background characteristics also significantly increment the prediction of how soon young people get HIV

Post-test Counseling. Specifically, being older and having an unknown HIV status predict receiving HIV Post-test Counseling Services sooner. There are no differences based on the interactions between gender and age, gender and HIV status, HIV status and the number of service dates, or gender and the number of service dates. After controlling for these effects, client behaviors significantly increment the prediction of who gets HIV Post-test Counseling Services sooner. Having risky sex with women and not being a substance abuser predicts how soon youth receive post-test counseling. There is no difference based on whether youth are known to have risky sex with men, sex with an injection drug user, survival sex, sex with an HIV-positive partner, sexually transmitted diseases, or injection drug use risk. Interactions among client behaviors do not significantly increment the prediction of how soon youth receive HIV Post-test Counseling, nor do the interactions between gender and HIV status with all eight client behaviors. Beyond those risk behaviors, criminal justice system involvement predicts how soon youth get HIV Post-test Counseling, while the absence of homelessness and mental health system-involvement predict such outcomes. In addition, being male and runaway or being criminal justice system-involved predicts receiving such services sooner, as do being female and being involved in the mental health system. The number of case management sessions and the interactions of the number of case management sessions with gender, HIV status, and age do not significantly increment the prediction of when HIV Post-test Counseling is provided.

For HIV Testing, project site and the number of service dates significantly predict the time until receiving services in this category. Above and beyond the effects of site and number of service dates, background characteristics also significantly predict the time until receiving HIV Testing. Having an unknown HIV status and being Asian American predicts receiving HIV Testing sooner. There is no difference in how soon clients receive such services based on gender,

age, and being African American, Caucasian, Hispanic, Native American, or multi-racial. Interactions between background characteristics do not significantly increment the prediction of how soon young people get HIV Testing. There are no differences based on the interactions between gender and age, gender and HIV status, age and HIV status, HIV status and the number of service dates, or gender and the number of service dates. The eight client behaviors do not significantly increment the prediction of who gets HIV Testing sooner, nor do the interactions between gender and HIV status with all eight client behaviors. Finally, other client characteristics (homeless, runaway, criminal justice system-involved, and mental health system-involved) and interactions between other client characteristics do not significantly increment the prediction of how soon young people get HIV Testing. The number of case management sessions and the interactions of the number of case management sessions with gender, HIV status, and age do not significantly increment the prediction of when HIV Testing is provided.

In terms of Referrals to HIV Testing, project site and the number of service dates significantly predict the time until receiving services in this category. Above and beyond the effects of site and number of service dates, background characteristics also significantly predict the time until receiving Referrals to HIV Testing. Specifically, being younger predicts getting Referrals to HIV Testing sooner. Being Asian American predicts receiving Referrals to HIV Testing later. There is no difference in how soon clients receive such services based on gender, HIV status, being African American, Caucasian, Hispanic, Native American, or multicultural. Interactions between background characteristics also do not significantly increment the prediction of how soon young people get Referrals to HIV Testing. Client behaviors significantly increment the prediction of who gets Referrals to HIV Testing sooner. Having a sexually transmitted disease and substance abuse predicts receiving Referrals to HIV Testing sooner,

while having risky sex with men predicts receiving such referrals later. There is no difference based on having risky sex with women, sex with an injection drug user, survival sex, sex with an HIV-positive partner, or injection drug use. The interactions between gender and HIV status with all eight client behaviors do not differentiate how soon youth receive Referrals to HIV Testing. Other client characteristics (homeless, runaway, criminal justice system-involved, and mental health system-involved) and interactions between other client characteristics also do not significantly increment the prediction of how soon young people get Referrals to HIV Testing. The number of case management sessions and the interactions of the number of case management sessions with gender, HIV status, and age do not significantly predict when Referrals to HIV Testing are provided.

For HIV Risk Assessment, project site and the number of service dates significantly predict the time until receiving services in this category. Above and beyond the effects of site and the number of service dates, background characteristics do not significantly predict the time until receiving an HIV Risk Assessment. There is no difference in how soon clients receive such services based on gender, age, HIV status, or ethnicity. After controlling for this effect, interactions between background characteristics significantly predict the time until receiving an HIV Risk Assessment. Specifically, being male and having more service dates predicts receiving HIV Risk Assessment sooner. There are no differences based on the interactions between gender and age, gender and HIV status, age and HIV status, and HIV status and number of service dates. After controlling for these effects, client behaviors do not significantly predict how soon a youth gets HIV Risk Assessment, nor do the interactions between gender or HIV status with the eight client behaviors. Additionally, other client characteristics and interactions between other client characteristics do not significantly increment the prediction of when young people get an HIV

Risk Assessment. The number of case management sessions and the interactions of the number of case management sessions with gender, HIV status, and age do not significantly predict when HIV Risk Assessment is provided.

For HIV Testing or Referrals, the site and number of service dates significantly predict the time until receiving services. Above and beyond the effects of site and the number of service dates, background characteristics do not significantly predict the time until receiving HIV Testing or Referrals, nor do the interactions of background characteristics. Controlling for the earlier steps in the model, interactions between gender and HIV status with all eight client behaviors, and other client characteristics (homeless, runaway, criminal justice system-involved, and mental health system-involved) and their interactions also do not significantly increment the prediction when youth receive HIV Testing or Referrals. The number of case management sessions and interactions of the number of case management sessions with gender, HIV status, and age do not significantly predict when HIV Testing or Referrals are provided.

Discussion

A key part of the innovative service models developed by this group of 10 national demonstration projects is to encourage young people to test for HIV either on-site or at an off-site affiliated program. For those youth who received any HIV services from the projects (which in virtually all cases was, at minimum, a risk assessment to determine whether the youth was a candidate for HIV testing), the median time to starting the sequence of pre-test counseling and testing was 1 day. That is, for more than half of the projects, the entry point to services for the youth was the risk assessment and then immediate pre-test counseling and testing.

What factors appear to affect the capacity of agencies to offer HIV counseling and testing services to youth? Organizationally, issues such as expanding referral networks, increasing the

involvement of young people, changing staffing levels and changing funding from a variety of sources all impact the ability of these organizations to offer HIV counseling and testing to youth. In terms of changes to the way services are provided, the projects took a number of steps to encourage young people to obtain HIV counseling and testing or to return for test results, including encouraging testing at the project's own site, targeted outreach by peer counselors, intensive follow-up contacts from case managers, providing incentives for returning for test results, and providing transportation to the clinic. These are all methods intended to increase utilization and follow-up rates for HIV counseling and testing services.

Although these projects had expanded capacity for providing HIV counseling and testing to youth, the willingness of young people to access such services varied considerably. The projects differed greatly in their own assessments of how readily youth in their target populations accepted HIV counseling and testing services in their respective communities. Staff from programs in Boston, Los Angeles, and San Francisco felt that youth accept such services readily, whereas key informants in areas such as Bridgeport, Indiana, and Seattle, were less optimistic about the readiness of this population to utilize counseling and testing services. Participation in this national service demonstration did enable the projects to improve their ability to provide HIV counseling and testing to young people by increasing rapport with youth in their respective communities and generally making the community more receptive to their services.

It should also be noted that the projects varied in their ability to reach diverse populations of at-risk youth for HIV testing. Each of the projects focused on a specific subpopulation of youth at risk, and some were more successful in reaching certain types of youth than others. Many project staff express the concern that HIV counseling and testing services are provided to the "worried well," and that the highest risk youth (e.g., gang-involved youth, injection drug

users) are still extremely difficult to encourage to access HIV testing. Often, young people at highest risk for HIV are dealing with so many other issues that HIV is the least of their priorities. A “hook” to engaging such youth in care may be to provide services that address other, perhaps more salient issues in their lives (such as providing basic needs such as food and shelter) or providing recreational activities that simultaneously address HIV risk reduction and related topics. In other cases, very high risk youth may actually receive pre-test counseling and an HIV test, but do not return for their test results for fear of learning of a positive result or lack of experience of knowledge as to how to navigate the healthcare system. New HIV testing technologies (Kassler, 1997) such as the OraSure method (Judson, Breese, Winters, Columbus, Santistevan, & George, 1997), finger stick (Anderson, Flynn, Britton, Aschere, Tabnak, & Nassar, 1993), and rapid HIV testing in which it is possible to obtain same-day results (e.g., Kassler, Dillon, Haley, Jones, & Goldman 1997), may help to reduce the barrier of having to wait for results and potentially losing the opportunity to engage the young person in care.

Similar to previous research (e.g., Rotheram-Borus, Gillis, Reid, Fernandez, & Gwadz, 1997), the present investigation found older youth to be more likely to seek HIV counseling and testing services. This finding has important implications for prevention. Although it may be difficult to get younger at-risk adolescents into testing services, early identification and linkage into care is critical to ensuring the health of youth found to be HIV-positive, and to providing early intervention to all youth who obtain HIV testing, regardless of their serostatus.

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Author Note

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Footnotes

¹ The cross-cutting evaluation is coordinated by The Measurement Group and was developed in collaboration with the 10 Adolescent Care Projects and HRSA. These forms are available in various reports on these projects (Huba et al., 1997 a, b, c) and are also available on the Internet (www.themeasurementgroup.com/adolspns/adolspns.htm) along with full instructions for their use.

² Human Subjects Protection Committees at each site determined if informed consent for participation in the evaluation was required or if the data were collected as part of the usual quality improvement process, and hence exempt. All data collection at all sites was voluntary for clients and providers and hence these data do have certain non-random patterns of missing observations.

³ The survival analyses technically model “survival without receiving the service.”

Table 1

Summary of the Entry Order for Predictor Variables in the Logistic and Multiple LinearRegression Models (Variables Entered in Sets)

| Step | Description | Indicators | Number of Terms |
|------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1 | Site Effect and Intensity of Services | 9 dummy-coded indicators of the 10 sites; total days in program; number of service days | 11 |
| 2 | Client Demographics (a) | Gender; age; ethnicity; HIV status (positive versus undetermined) | 4 |
| 3 | Client Demographics and Program Intensity Interactions | 2-way interactions of gender-age; gender-HIV status; age-HIV status; number of service days-HIV status; number of service days-gender | 5 |
| 4 | Client Characteristics | 8 indicators (risky sex with men; risky sex with women; sex with injection drug user; survival sex; sex with HIV-positive partner; sexually transmitted diseases; substance abuse; injection drug risk) | 8 |
| 5 | Client Demographics by Behavior Interactions | 2-way interactions of HIV status with each of the 8 client behaviors; 2-way interactions of gender with each of the 8 client behaviors | 16 |
| 6 | Other Client Characteristics and Interactions | 4 indicators (homeless; runaway; criminal justice system-involved; mental health-involved); 2-way interactions of gender with each of the 4 client characteristics | 8 |
| 7 | Case Management Service Utilization (Cox regressions only) | Number of days of case management service utilization; 2-way interactions of case management service utilization with gender, HIV status, and age | 4 |

Table 2

Hierarchical Regression on Whether or Not Clients Received HIV Testing Services

| Model Step | Model Summary | Significant Individual Model Effects | | | | |
|-------------------------------------------------------|----------------------------|--------------------------------------|-----------------------|-------|------------|-----------------------|
| | χ^2 Change | R | Wald Test | B | Odds Ratio | 95% CI for Odds Ratio |
| Step 1: Site and service days | $\chi^2(11)=1140.25^{***}$ | | | | | |
| Site | | --- | --- | --- | --- | --- |
| Step 2: Background characteristics | $\chi^2(9)=241.97^{***}$ | | | | | |
| HIV status | | -.20 | 138.55 ^{***} | -2.64 | .07 | .05-.11 |
| Caucasian | | .08 | 24.87 ^{***} | .72 | 2.07 | 1.55-2.75 |
| Native American | | .03 | 6.02 [*] | .75 | 2.11 | 1.16-3.83 |
| Step 3: Background characteristics interactions | $\chi^2(5)=5.41$ | | | | | |
| Step 4: Client behaviors | $\chi^2(8)=122.17^{***}$ | | | | | |
| Risky sex with men | | .12 | 47.63 ^{***} | .79 | 2.20 | 1.76-2.75 |
| Risky sex with women | | .10 | 35.61 ^{***} | .72 | 2.06 | 1.62-2.61 |
| Survival sex | | -.05 | 10.63 ^{**} | -.61 | .55 | .38-.79 |
| Sex with an HIV-positive person | | -.05 | 8.49 ^{**} | -.65 | .52 | .34-.81 |
| Sexually transmitted diseases | | .09 | 26.41 ^{***} | .68 | 1.97 | 1.52-2.55 |
| Step 5: Two-way interaction with client behaviors | $\chi^2(16)=70.21^{***}$ | | | | | |
| Gender by risky sex with men | | .09 | 26.62 ^{***} | 1.21 | 3.36 | 2.12-5.33 |
| Gender by risky sex with women | | -.04 | 6.17 [*] | -.67 | .51 | .30-.87 |
| Gender by sex with an HIV-positive person | | -.04 | 5.94 [*] | -1.18 | .31 | .12-.79 |
| HIV status by sex with an IDU | | -.03 | 4.33 [*] | -1.42 | .24 | .06-.92 |
| Step 6: Other client characteristics and interactions | $\chi^2(8)=19.65^*$ | | | | | |
| Gender by criminal justice system-involved | | .04 | 6.50 [*] | 1.03 | 2.80 | 1.27-6.18 |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Only statistically significant effects are shown.

Table 3

Summary of Kaplan-Meier Survival Analyses on Time in Program Until Receiving HIV Testing and Counseling Services

| Service | Males | Females |
|------------------------------------|-----------------------------------------------------------------------------------------|-----------------|
| A. Pre-Test Counseling | | |
| Median | 1.00 (±---) | 1.00 (±---) |
| Mean | 307.18 (±22.65) | 257.63 (±19.95) |
| | Log-rank $\chi^2(1)=1.00$ Breslow $\chi^2(1)=0.20$ Tarone-Ware $\chi^2(1)=0.31$ | |
| B. Post-Test Counseling | | |
| Median | 22.0 (±2.18) | 22.00 (±0.93) |
| Mean | 348.21 (±26.03) | 336.27 (±22.57) |
| | Log-rank $\chi^2(1)=1.02$ Breslow $\chi^2(1)=3.88^*$ Tarone-Ware $\chi^2(1)=3.01$ | |
| C. HIV Testing | | |
| Median | 1.00 (±---) | 1.00 (±---) |
| Mean | 339.03 (±24.75) | 318.24 (±22.61) |
| | Log-rank $\chi^2(1)=0.24$ Breslow $\chi^2(1)=1.32$ Tarone-Ware $\chi^2(1)=1.04$ | |
| D. Referrals to HIV Testing | | |
| Median | 1.00 (±---) | 1.00 (±---) |
| Mean | 225.28 (±18.67) | 201.45 (±15.17) |
| | Log-rank $\chi^2(1)=0.07$ Breslow $\chi^2(1)=0.04$ Tarone-Ware $\chi^2(1)=0.01$ | |
| E. HIV Risk Assessment | | |
| Median | 1.00 (±---) | 1.00 (±---) |
| Mean | 178.00 (±16.45) | 176.73 (±16.04) |
| | Log-rank $\chi^2(1)=0.90$ Breslow $\chi^2(1)=1.92$ Tarone-Ware $\chi^2(1)=1.70$ | |
| F. HIV Testing or Referrals | | |
| Median | 1.00 (±---) | 1.00 (±---) |
| Mean | 37.95 (±5.01) | 41.41 (±4.24) |
| | Log-rank $\chi^2(1)=0.10$ Breslow $\chi^2(1)=0.10$ Tarone-Ware $\chi^2(1)=0.00$ | |

Note. * $p < .05$; $N = 2,642$ and all clients in the sample will have received at least one of the HIV-related services.

Table 4

Summary of (Cox Regression) Analyses on the Effects of Client Characteristics on Time Until Receiving HIV Testing and Counseling Services¹

| | HIV Pre-Test Counseling | HIV Post-Test Counseling | HIV Testing | Referrals to HIV Testing | HIV Risk Assessment | HIV Testing or Referral |
|-------------------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------|
| Step 1: Site and service days | $\chi^2(10)=623.12^{**}$ * | $\chi^2(10)=540.96^{**}$ * | $\chi^2(10)=598.87^{**}$ * | $\chi^2(10)=340.20^{**}$ * | $\chi^2(10)=306.53^{**}$ * | $\chi^2(10)=56.20^{***}$ |
| Site | --- (---)*** | --- (---)*** | --- (---)*** | --- (---)*** | --- (---)*** | --- (---)*** |
| Number of service dates | -.01 (.003)*** | -.01 (.003)*** | -.01 (.003)*** | -.01 (.002)*** | -.01 (.002)*** | -.01 (.002)*** |
| Step 2: Background characteristics | $\chi^2(9)=28.42^{***}$ | $\chi^2(9)=59.03^{***}$ | $\chi^2(9)=53.22^{***}$ | $\chi^2(9)=117.41^{***}$ | $\chi^2(9)=14.75$ | $\chi^2(9)=11.06$ |
| Gender | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Age | n.s. | .06 (.01)*** | n.s. | -.06 (.01)*** | n.s. | n.s. |
| HIV status | -.88 (.24)*** | -.72 (.23)** | -1.38 (.28)*** | n.s. | .57 (.19)** | -.45 (.16)** |
| African American | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Asian American | n.s. | -.29 (.10)** | .20 (.08)* | -.40 (.08)*** | n.s. | n.s. |
| Caucasian | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Hispanic | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Native American | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Multi-racial | n.s. | .30 (.16)* | n.s. | n.s. | n.s. | n.s. |
| Step 3: Background characteristics interactions | $\chi^2(5)=11.34^*$ | $\chi^2(5)=12.28^*$ | $\chi^2(5)=3.38$ | $\chi^2(5)=8.98$ | $\chi^2(5)=12.35^*$ | $\chi^2(5)=9.10$ |
| Gender by age | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by HIV status | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Age by HIV status | -.21 (.09)* | -.23 (.08)** | n.s. | n.s. | n.s. | n.s. |
| HIV status by service dates | n.s. | n.s. | n.s. | .01 (.005)* | n.s. | .01 (.004)* |
| Gender by service dates | n.s. | n.s. | n.s. | n.s. | -.01 (.01)* | n.s. |

(Table continues)

¹Individual effects are shown as regression coefficients (B) and their standard errors; $N = 2,642$ and all clients in the sample will have received at least one of the HIV-related services.

Table 4

Summary of (Cox Regression) Analyses on the Effects of Client Characteristics on Time Until Receiving HIV Testing and Counseling Services¹

| | HIV Pre-Test Counseling | HIV Post-Test Counseling | HIV Testing | Referrals to HIV Testing | HIV Risk Assessment | HIV Testing or Referral |
|---------------------------------------------------|-------------------------|--------------------------|-------------------------|---------------------------|-------------------------|-------------------------|
| Step 4: Client behaviors | $\chi^2(8)=9.40$ | $\chi^2(8)=20.13^{**}$ | $\chi^2(8)=12.53$ | $\chi^2(8)=75.40^{***}$ | $\chi^2(8)=11.12$ | $\chi^2(8)=4.71$ |
| Risky sex with men | n.s. | n.s. | n.s. | -.22 (.07) ^{***} | n.s. | n.s. |
| Risky sex with women | .15 (.07) [*] | .23 (.08) ^{**} | .17 (.07) [*] | n.s. | n.s. | n.s. |
| Sex with an IDU | -.17 (.08) [*] | n.s. | -.18 (.09) [*] | n.s. | -.18 (.08) [*] | n.s. |
| Survival sex | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Sex with an HIV-positive person | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Sexually transmitted diseases | n.s. | n.s. | n.s. | .19 (.06) ^{**} | n.s. | n.s. |
| Substance abuse | n.s. | -.20 (.08) [*] | n.s. | .40 (.06) ^{***} | n.s. | n.s. |
| IDU risk | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Step 5: Two-way interaction with client behaviors | $\chi^2(16)=20.30$ | $\chi^2(16)=23.82$ | $\chi^2(16)=16.17$ | $\chi^2(16)=23.05$ | $\chi^2(16)=9.04$ | $\chi^2(16)=8.88$ |
| Gender by risky sex with men | n.s. | .56 (.22) [*] | n.s. | n.s. | n.s. | n.s. |
| Gender by risky sex with women | n.s. | n.s. | n.s. | -.47 (.15) ^{**} | n.s. | n.s. |
| Gender by sex with an IDU | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by survival sex | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by sex with an HIV-positive person | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by STDs | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by substance abuse | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by IDU Risk | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |

(Table continues)

¹Individual effects are shown as regression coefficients (B) and their standard errors; $N = 2,642$ and all clients in the sample will have received at least one of the HIV-related services.

Table 4

Summary of (Cox Regression) Analyses on the Effects of Client Characteristics on Time Until Receiving HIV Testing and Counseling Services¹

| | HIV Pre-Test Counseling | HIV Post-Test Counseling | HIV Testing | Referrals to HIV Testing | HIV Risk Assessment | HIV Testing or Referral |
|-------------------------------------------------------|-------------------------|--------------------------|-------------------|--------------------------|---------------------|-------------------------|
| HIV status by risky sex with men | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by risky sex with women | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by sex with an IDU | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by survival sex | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by sex with an HIV-positive person | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by STDs | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by substance abuse | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| HIV status by IDU risk | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Step 6: Other client characteristics and interactions | $\chi^2(8)=19.01^*$ | $\chi^2(8)=49.79^{***}$ | $\chi^2(8)=14.50$ | $\chi^2(8)=7.66$ | $\chi^2(8)=7.62$ | $\chi^2(8)=2.50$ |
| Homeless | n.s. | -.35 (.13)** | n.s. | n.s. | n.s. | n.s. |
| Runaway | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Criminal justice system-involved | .25 (.13)* | .93 (.17)** | n.s. | n.s. | n.s. | n.s. |
| Mental health system-involved | n.s. | -.49 (.16)** | n.s. | n.s. | n.s. | n.s. |
| Gender by homeless | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| Gender by runaway | n.s. | -.55 (.25)* | n.s. | n.s. | n.s. | n.s. |
| Gender by CJS-involved | n.s. | -.87 (.24)** | n.s. | n.s. | n.s. | n.s. |
| Gender by mental health system-involved | n.s. | .62 (.20)** | n.s. | n.s. | n.s. | n.s. |

(Table continues)

¹Individual effects are shown as regression coefficients (B) and their standard errors; $N = 2,642$ and all clients in the sample will have received at least one of the HIV-related services.

Table 4

Summary of (Cox Regression) Analyses on the Effects of Client Characteristics on Time Until Receiving HIV Testing and Counseling Services¹

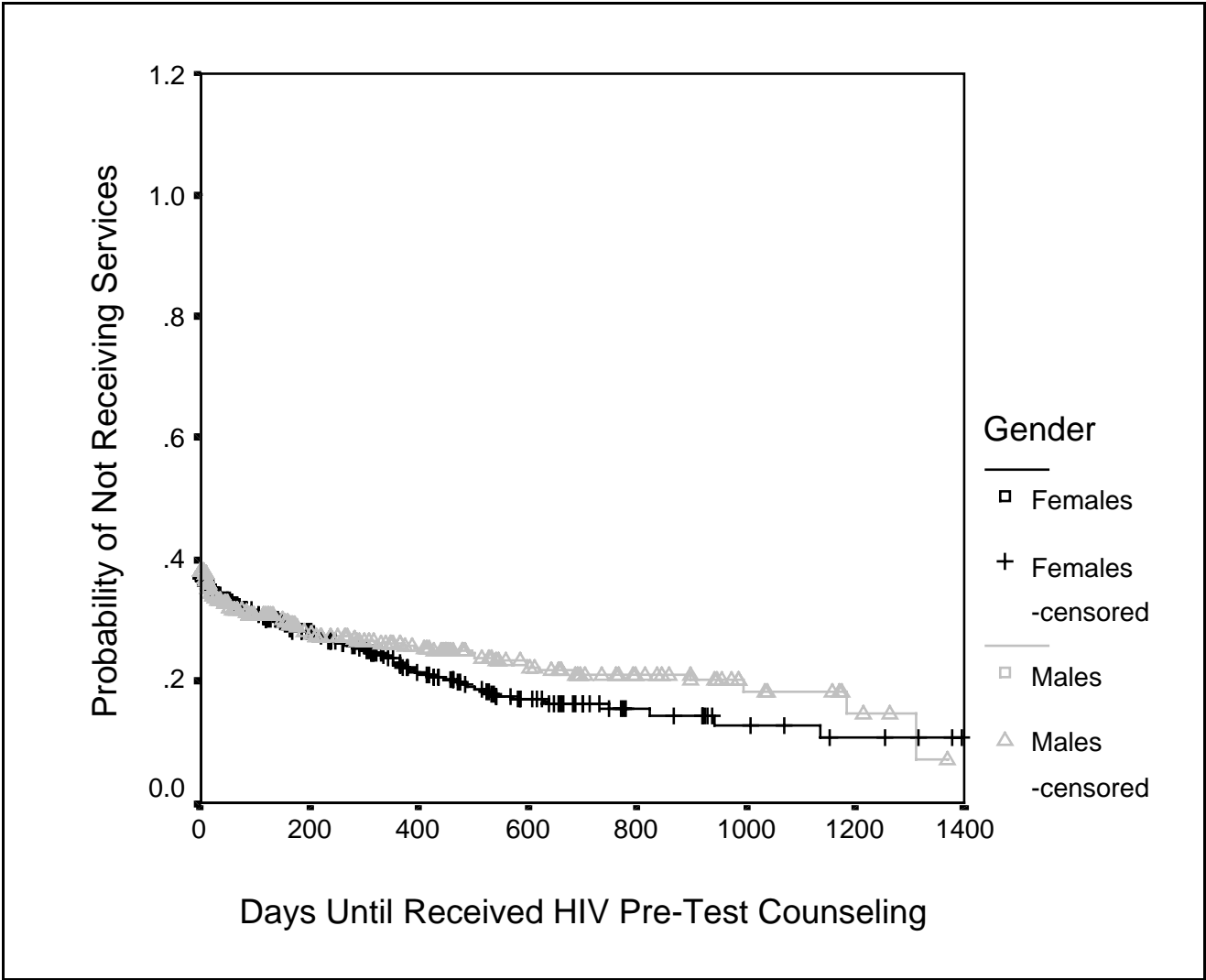
| | HIV Pre-Test Counseling | HIV Post-Test Counseling | HIV Testing | Referrals to HIV Testing | HIV Risk Assessment | HIV Testing or Referral |
|------------------------------------------------------|-------------------------|--------------------------|------------------|--------------------------|---------------------|-------------------------|
| Step 7: Case Management and Interactions | $\chi^2(4)=3.64$ | $\chi^2(4)=3.81$ | $\chi^2(4)=7.32$ | $\chi^2(4)=6.72$ | $\chi^2(4)=2.04$ | $\chi^2(4)=7.43$ |
| The number of case management sessions | n.s. | n.s. | n.s. | .02 (.01)* | n.s. | .03 (.01)** |
| The number of case management sessions by gender | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| The number of case management sessions by HIV status | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |
| The number of case management sessions by age | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |

Note. N=2,642; *p < .05; **p < .01; ***p < .001

¹Individual effects are shown as regression coefficients (B) and their standard errors; N = 2,642 and all clients in the sample will have received at least one of the HIV-related services.

Figure 1

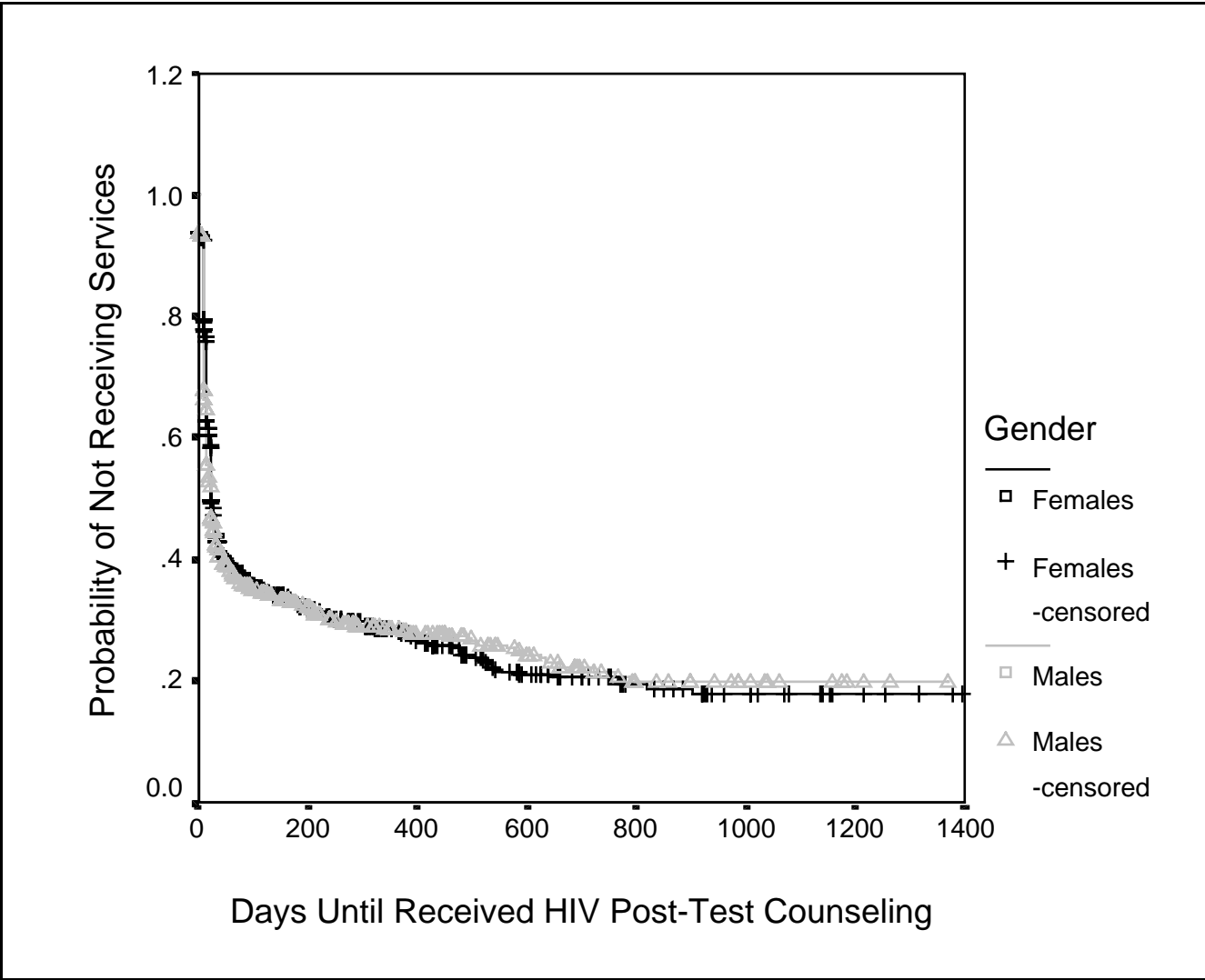
Kaplan-Meier Survival Analyses on Time in Program Until Receiving HIV Pre-Test Counseling Services



Note. All clients in all programs are combined in this Figure but retention curves are shown separately for males and females who are either known to have tested positive for HIV or those whose status is unknown.

Figure 2

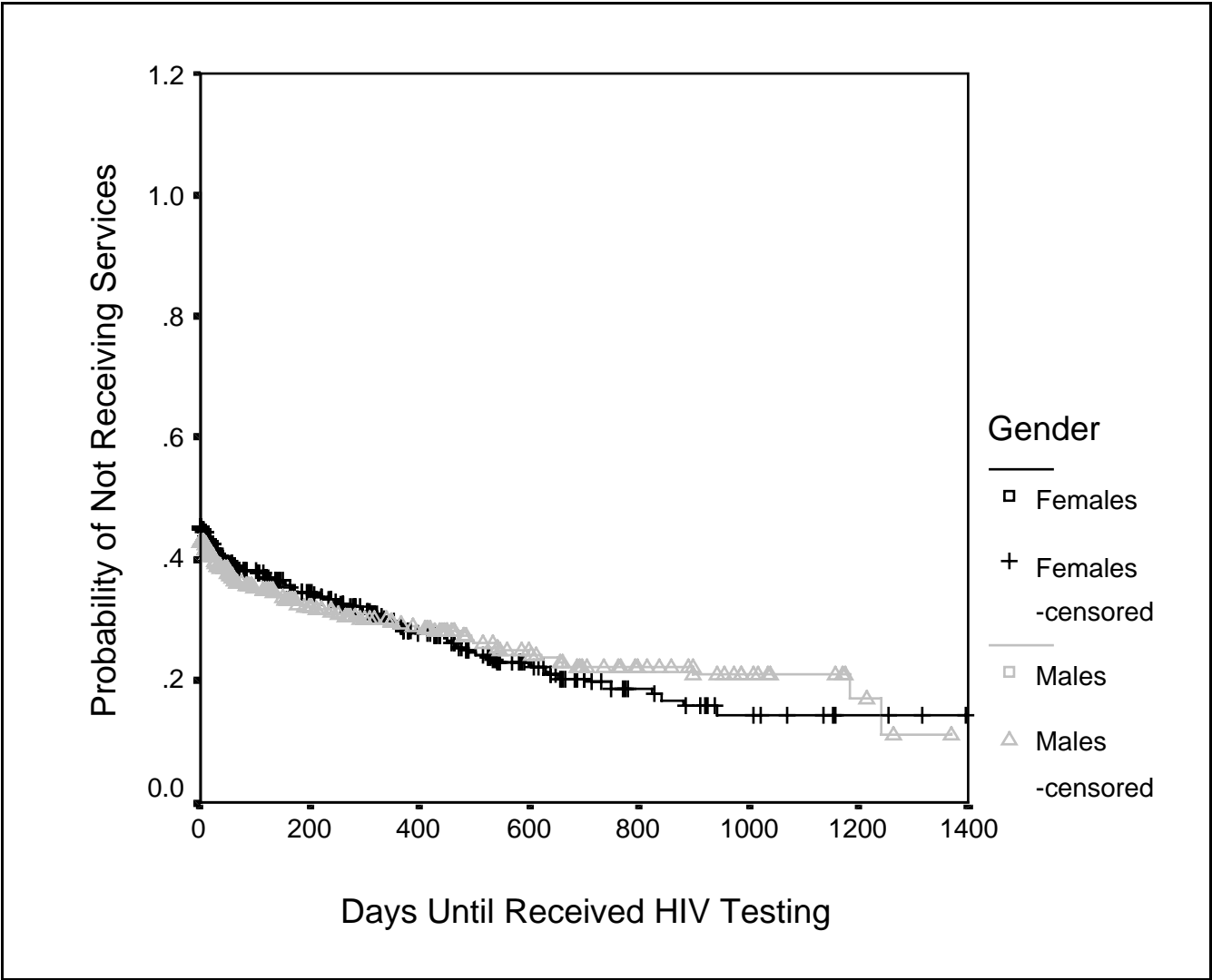
Kaplan-Meier Survival Analyses on Time in Program Until Receiving HIV Post-Test Counseling Services



Note. All clients in all programs are combined in this Figure but retention curves are shown separately for males and females who are either known to have tested positive for HIV or those whose status is unknown.

Figure 3

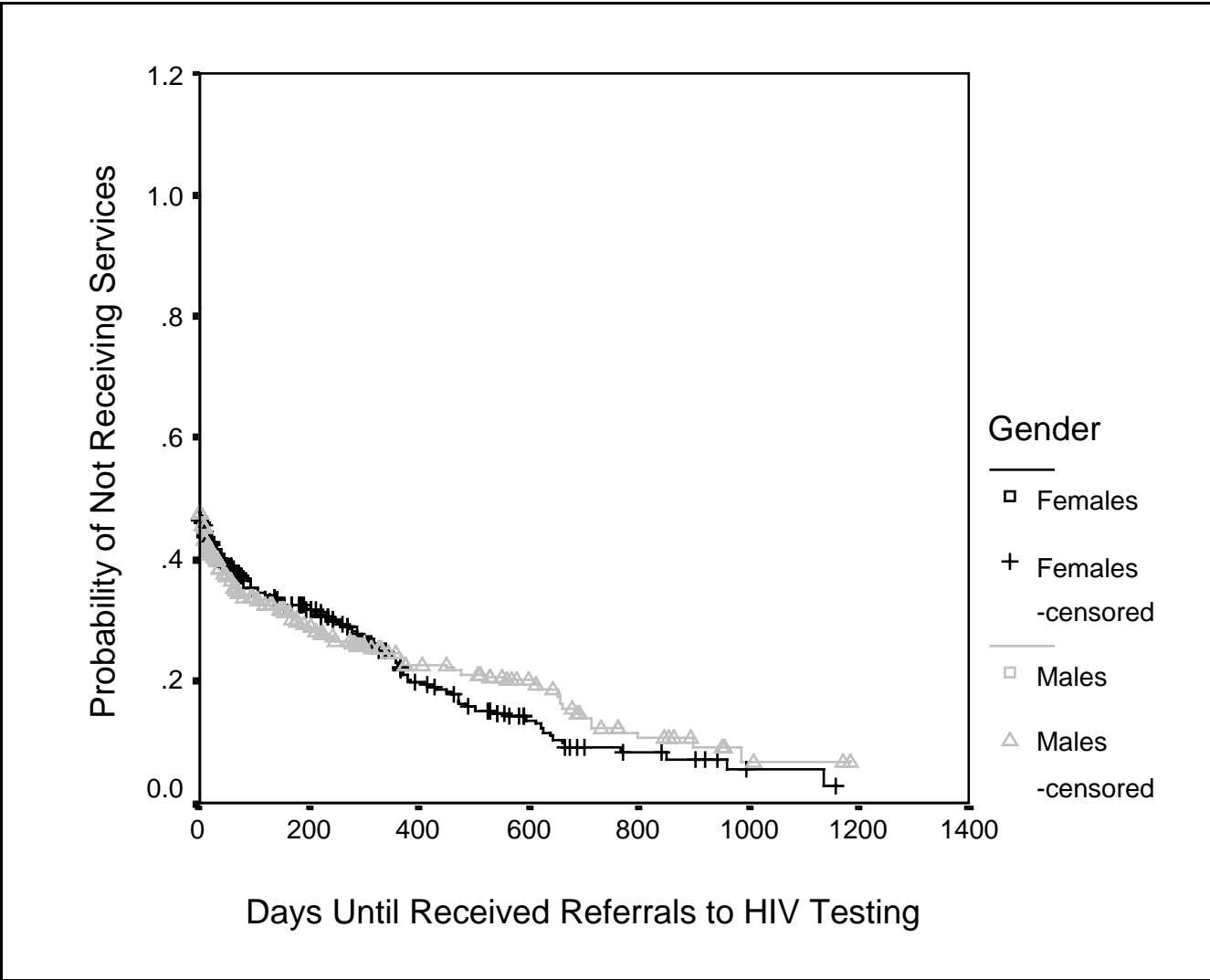
Kaplan-Meier Survival Analyses on Time in Program Until Receiving HIV Testing Services



Note. All clients in all programs are combined in this Figure but retention curves are shown separately for males and females who are either known to have tested positive for HIV or those whose status is unknown.

Figure 4

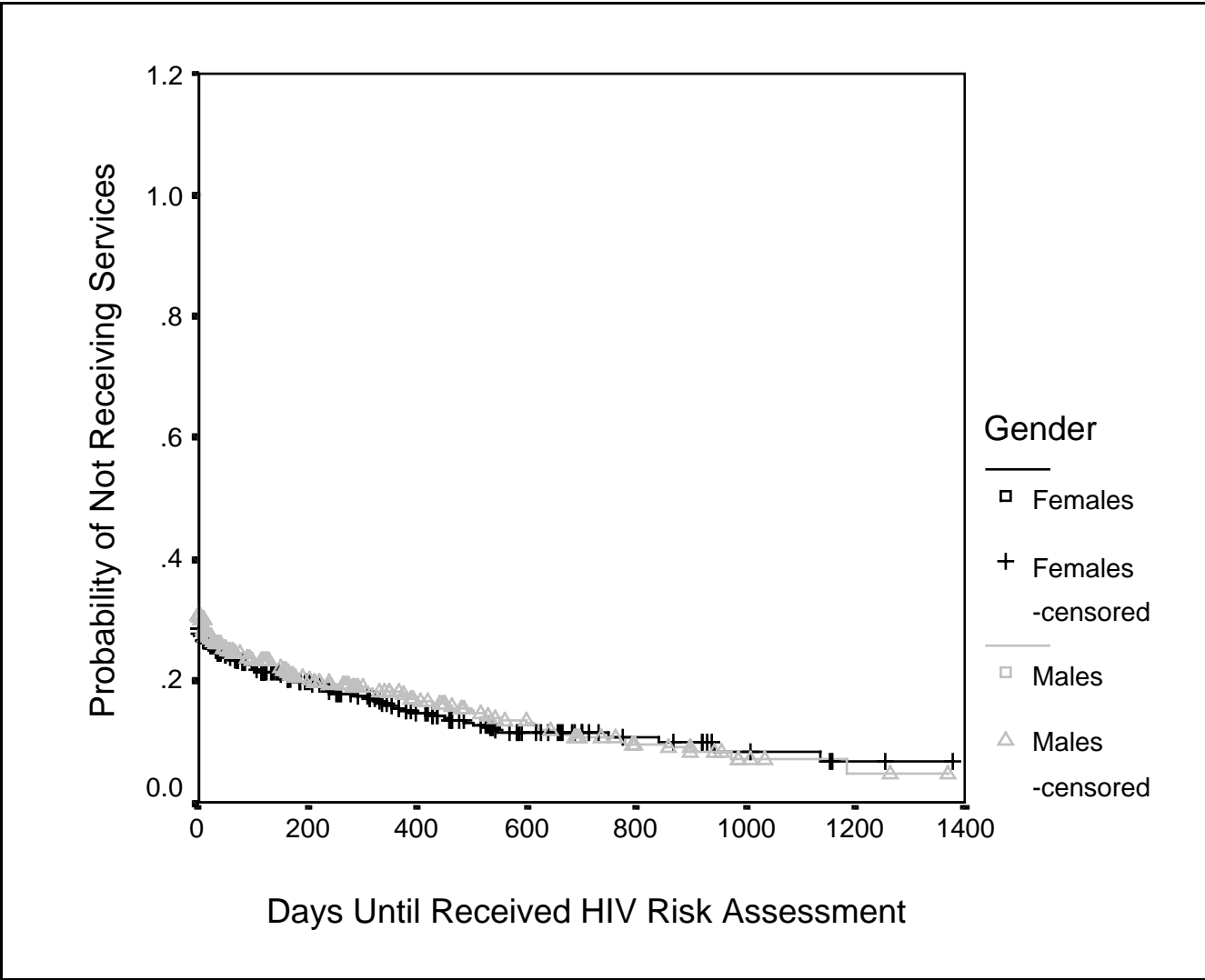
Kaplan-Meier Survival Analyses on Time in Program Until Receiving Referrals to HIV Testing Services



Note. All clients in all programs are combined in this Figure but retention curves are shown separately for males and females who are either known to have tested positive for HIV or those whose status is unknown.

Figure 5

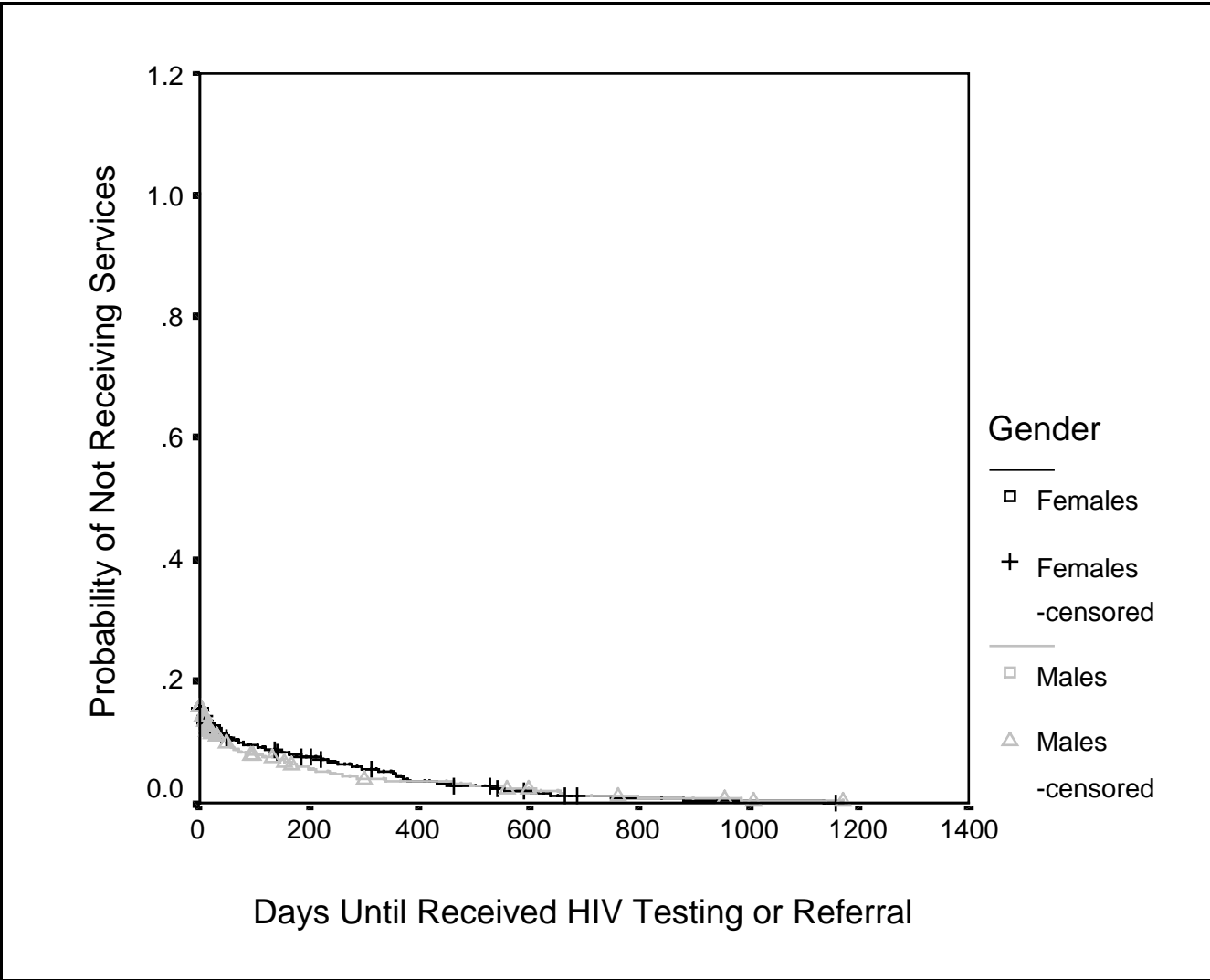
Kaplan-Meier Survival Analyses on Time in Program Until Receiving HIV Risk Assessment Services



Note. All clients in all programs are combined in this Figure but retention curves are shown separately for males and females who are either known to have tested positive for HIV or those whose status is unknown.

Figure 6

Kaplan-Meier Survival Analyses on Time in Program Until Receiving HIV Testing or Referral Services



Note. All clients in all programs are combined in this Figure but retention curves are shown separately for males and females who are either known to have tested positive for HIV or those whose status is unknown.