

## Outreach, Mental Health, and Case Management Services: Can They Help to Retain HIV-Positive and At-Risk Youth and Young Adults in Care?

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*Objectives:* To assess the impact of outreach, mental health, and case management services on retention in primary care of HIV+ and at-risk youth and young adult clients of the Boston HAPPENS program, a comprehensive adolescent HIV prevention and care network of agencies. *Methods:* Providers at 8 urban sites used standard data forms at each visit to collect background and service receipt information on at-risk clients aged 12–24 years. Data were aggregated across all visits for each client to create summary variables for the number of times each client received each type of service. The retention measure was the number of days between a client's first and last visits during the 4-year data collection period. Kaplan–Meier survival curve and Cox proportional hazards regression analyses were used to assess the association between receipt of the support services of interest and the retention measure. *Results:* The median retention times were 21 days for male clients (range, 0–1406,  $N = 512$ ), and 26 days for female clients (range, 0–1577,  $N = 914$ ). Among males, 45% were retained beyond a month, 24% beyond a year, and 10% beyond 2 years. Similar proportions of females were retained beyond a month and a year, but more females were retained beyond 2 years (15%). After adjusting for other covariates, both male and female clients had significantly longer retention times if they received  $\geq 2$  outreach contacts, or case management at  $\geq 3$  visits. Among males, receipt of mental health counseling at  $\geq 2$  visits also increased retention times. *Conclusions:* These findings suggest that provision of outreach, mental health, and case management services can improve retention in care of at-risk youth and young adults.

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**KEY WORDS:** adolescents; health care; retention in care; outreach; case management.

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## INTRODUCTION

It is estimated that at least half of all new HIV infections in the United States are among individuals under 25 years (1), highlighting the importance of engaging and retaining youth in health services aimed at HIV prevention, diagnosis, and care. However, national data show that adolescents and young adults aged 15–24 years have historically had the lowest rates of utilization of medical care of any age group and their visit rate actually declined between 1985 and 1999 (2–5). Young people with the highest risk of contracting HIV, such as those who are homeless/runaway, gay/lesbian/bisexual/transgender and questioning, sex trade-involved, or substance-abusing, are often the least likely to receive adequate health care, particularly primary and preventive care, due to barriers such as lack of insurance, a trusted provider, or knowledge of available services (6–8). These at-risk youth have the highest rates of engaging in HIV risk behaviors such as unprotected sex, injection drug use, and needle-sharing (9, 10), and are the least likely to receive care in traditional health care settings (11, 12).

Recent innovative programs aimed at connecting and keeping at-risk youth and young adults in primary care have included outreach, case management, and mental health support services as integral parts of a client-centered, comprehensive system of care (13–16). Several studies have described outreach services as necessary for seeking out and engaging in care the most difficult-to-reach youth, such as those who are homeless or substance-involved (17–20). In addition, these youth often have many competing social service and mental health needs that make it difficult for them to attend to their medical needs. Case management services, which link clients to services such as food assistance, housing, and mental health care, such as counseling and substance abuse treatment, have been described as important for maintaining at-risk youth in care by addressing these other needs (21–23). However, few studies have demonstrated that these services actually improve retention of at-risk youth in primary and preventive care. Empirical evidence for their effectiveness could help provide support for continued, or increased, funding for these services, and help program planners develop more effective systems of care.

The majority of studies to date exploring predictors of retention in care of vulnerable populations have focused on the retention of adult clients in substance abuse or HIV treatment programs (24–30).

For example, a group of recent studies funded by the U.S. Health Resources and Services Administration, under Title I of the Ryan White CARE Act, examined the effect of ancillary services (i.e., case management, mental health counseling, substance abuse treatment, and other support services addressing clients' nonmedical needs) on retention in care of HIV-positive (HIV+) adults (31–37). These studies, which included eight sites across the United States representing a range of program models, generally found that ancillary services, when meeting identified client needs, were associated with increased retention of HIV-infected clients in care, as defined by a minimum of one primary care visit every 6 months. Similarly, another study of adult female clients of an HIV-outpatient program found that those who had at least two contacts with a case manager per month, or received ancillary services more than four times a month, were more likely to be retained in primary care, defined as having at least one clinic visit a month (26).

While these studies provide some initial evidence regarding the utility of support services such as case management and mental health services in engaging and retaining individuals in care, they focused only on adults who were already HIV+ and in HIV treatment programs. Therefore, their findings have limited generalizability to programs trying to retain high-risk, hard-to-reach adolescents and young adults, particularly those who are not yet infected by HIV, in primary and preventive care. The main objective of our study was to identify individual and service-related predictors of retention in care of clients of a comprehensive adolescent and young adult HIV prevention and care program serving high-risk, hard-to-reach populations who generally do not access consistent care, such as homeless or street youth. Specifically, the impact of outreach, mental health counseling, and case management services on client retention in care was assessed.

## METHOD

### Program Description

The Boston HAPPENS (HIV Adolescent Provider and Peer Education Network for Services) Program was funded in 1993 by the Special Projects of National Significance (SPNS) Program of the Health Resources and Services Administration to help meet the needs of HIV+ youth and youth at risk for HIV

in metropolitan Boston (38, 39). This network of eight core agencies provided comprehensive, coordinated care to clients aged 12–24 years, and targeted HIV+ youth, street youth, and other youth at significant risk for HIV infection (38, 40, 41). Two multiservice outreach agencies (Bridge Over Troubled Waters, Justice Resource Institute) emphasized street outreach by outreach workers, health educators, HIV counselors, and youth staff, and provided basic needs services (food, clothing, and shelter) and connections to health care. In addition, each agency had drop-in centers or daytime programs for homeless, runaway and street-involved youth. One agency had a storefront clinic on the Boston Common (a venue for homeless and street youth) that provided walk-in care, primary and HIV care, case management, substance abuse, and mental health services, while the other agency had a mobile van, medical screening clinic, substance abuse services, residential and GED programs, and free dental services. Three community-based health centers (Martha Eliot Health Center, Roxbury Comprehensive Community Health Center, Dimock Community Health Center) provided comprehensive, one-stop health care including primary care, reproductive services, HIV services, mental health and substance services, case management, outreach and youth development programs, teen clinics, and dental care. Finally, three teaching hospitals (Children's Hospital Boston, New England Medical Center, Boston Medical Center) provided a range of medical and mental health services for youth including adolescent/young adult clinics, primary and specialty HIV care, HIV case management, access to HIV clinical trials, and inpatient medical and psychiatric care. Two hospitals also supported outreach service coordinators who performed direct street and community outreach, and connected to other outreach workers in the area. Together, the HAPPENS agencies provided a comprehensive system of care characterized by the following seven core components:

1. health education and risk reduction counseling delivered by outreach workers, health educators, and adult-supervised peer staff;
2. access to free, confidential and anonymous, developmentally and culturally appropriate HIV counseling and testing services (CTS);
3. health status screening and ongoing needs assessment;
4. client-focused, comprehensive multidisciplinary care and support including outreach services, basic needs services, primary care, nurse case management, and interdisciplinary and HIV specialty care;
5. life management counseling which integrates mental health and substance abuse care into the medical and case management visits, and assessments at times of crisis;
6. follow-up and outreach to ensure continuing care; and
7. integrated care, communication, and collaboration between providers in the metropolitan Boston area through regular planning and educational meetings.

Clients entered the program either through a referral from primary care providers or community or social service agencies, through HIV CTS, or through street outreach.

### Data Collection

These analyses utilized program data from the grant period January 1994 through June 1998. During this period, HAPPENS providers used standard "Contact" and "Intervention" forms to collect client background, HIV risk, and service information at each encounter. At a client's enrollment into the program, or at the time of each contact through outreach, providers completed a one-page "Contact" form to document characteristics of the contact including type of contact (e.g., direct outreach or phone call), location of contact (e.g., street, shelter, clinic, hospital, etc.), services provided such as health education topics discussed and items provided (e.g., educational materials, condoms, medications, food/vouchers, etc.), and referrals made to medical and social services (e.g., HIV CTS, STD clinic, shelter/housing, etc.). In addition, the "Contact" form was used to record client demographics (i.e., gender, age, race/ethnicity, self-identified sexual orientation, mental health system involvement, whether the client was homeless or a runaway) and self-reported HIV risks such as having sex with a partner who was HIV+ or an injection drug user (IDU), substance use behaviors, and history of pregnancy or sexually-transmitted diseases (STD). Most data fields were "bubbles" which were marked only if the risk was present or the service provided. Providers updated client information if changes were identified at subsequent visits.

Providers completed an "Intervention" form for each enrolled client's visit to any HAPPENS site to record health services provided including HIV

CTS and care, case management, mental health and substance abuse counseling, health education, participation in support groups, and scheduled, walk-in, and emergency room medical care. The data collection forms were standardized instruments developed for the SPNS National Cross Cutting Evaluation by The Measurement Group in collaboration with the 10 adolescent SPNS Projects and the SPNS Program staff (42). They are available at [www.themeasurementgroup.com](http://www.themeasurementgroup.com).

Providers collected all data without client names or medical record numbers. Unique identifiers were used to link client data across all of their contacts and visits. Since anonymous data were being collected by providers to evaluate and improve services, the Human Investigation Committees of all participating agencies waived the need for informed consent.

### Variables

We defined *retention* as the number of days between a client's first and last visits during the 4-year data collection period. Visits included all outreach contacts and site visits where HIV CTS, medical care, family planning, health screening and education, mental health therapy, or referrals were provided. We chose this measure of retention, rather than the number of visits or rate of visits, because a key aim of the HAPPENS program was to reach at-risk youth *before* they became infected with HIV (97% of all clients were HIV-negative (HIV-) or untested), and we needed to identify a measure of retention that allowed uninfected youth, who used the program largely for primary care and had infrequent visits over a number of years, to be considered retained in the program. Moreover, since HAPPENS clients varied widely in their service needs, and the program sites offered such a wide range of services, no single regimen of care could be used to define retention across all participants. Our retention measure was broad enough to accommodate a wide range of care utilization patterns. However, the number of days in the program was highly correlated with the number of all visits (Spearman's  $\rho = 0.94$ ), suggesting that these two measures may represent the same construct.

For our primary predictor variables of interest, we defined *outreach* as including all street outreach, phone calls made by any provider (outreach workers, nurses, physicians), and any other contacts initiated by providers or outreach workers outside of client visits. Case management services, provided face-to-face or

by phone, consisted of nursing case management, with nurses arranging health care visits and implementing the treatment plan, and practical support such as connection to housing, food, support groups, and access to medications. Mental health counseling included individual or group counseling, family/couple counseling, and crisis intervention.

We collapsed the data for the number of times each service type was received into trichotomous categorical variables so as to appropriately account for the highly skewed frequency distributions of these data, and to minimize an apparent circularity and causality problem between the predictor variables and the outcome variable (i.e., the longer someone is retained in care, the more times she is likely to have received services). The circularity between measures would have been greater with the use of continuous predictor variables. Moreover, by using categorical variables, we were able to generate hazard (or survival) ratios (similar to odds ratios) comparing the likelihood of retention over time across specific threshold values of receipt of each type of service. On the basis of initial Kaplan–Meier survival analyses which indicated possible threshold levels, we categorized the outreach and mental health counseling data into none, one, and two or more times, and the case management data into none, one to two, and three or more times.

Other service and client-related factors were also analyzed as possible predictors of retention in care. To assess whether a client's likelihood of being maintained in the program was influenced by where they started their care, a "type of site of initial care" variable was created with the categories "hospitals," "community health centers," and "multiservice outreach agencies." Client characteristics examined included gender, age, race/ethnicity (White non-Hispanic, Black non-Hispanic, Hispanic, Other (including Asian and Native American)), sexual orientation (gay, lesbian, bisexual, or undecided (GLBU) vs. other), homelessness (homeless/runaway vs. other), mental health (MH) system involvement, and HIV status (confirmed positive vs. negative or untested). HIV risk characteristics included unprotected sex with males, unprotected sex with females, history of STD or pregnancy, history of substance abuse behaviors including IDU and needle-sharing, and history of high-risk sexual behaviors including survival sex, sex with IDU or HIV+ partners. Age at enrollment into the program was calculated using the date of birth. Gender, race/ethnicity, sexual orientation and all HIV risk information were self-reported by clients. Clients identified as being involved in the mental health

system received extensive services through state agencies. HIV status was confirmed through HIV blood tests. For these analyses, clients were considered to have a characteristic if that characteristic was noted at any of their visits.

### Statistical Analyses

Data across multiple contacts and health service visits for an individual were aggregated to the number of distinct individuals as the unit of measure. Univariate statistics (means and proportions) were generated to describe client demographics and receipt of specific services, and gender differences were assessed using the chi-square test, one-way ANOVA, and Mann–Whitney U procedures, depending on the type of response distribution. These analyses were performed using SPSS<sup>®</sup> 10.1 software (43). Because of significant gender differences in client profiles, all further analyses were performed stratified by gender.

We examined the association between hypothesized predictor variables and program retention using survival analyses methods including Kaplan–Meier survival curves, the log-rank test to assess differences between groups, and Cox proportional hazards regression modeling (44). Not all clients were deemed to have had their “last” visit before program data collection ended in June of 1998. Clients who had a visit sometime during the last year of the program were treated as “censored” in all survival analyses because they may have continued care after data collection had ended.

Because of the potential for lack of independence across observations within each care site (clustering), SUDAAN<sup>®</sup> software was used to yield more precise estimates of variance (45). The bivariate association of each predictor variable with program retention was examined in an unadjusted Cox regression model that yielded an unadjusted hazard ratio (HR) (the odds of dropping out of the program of one group compared to the reference group), and a 95% confidence interval. All predictor variables that were significant or marginally significant ( $p < 0.10$  level used to avoid a type II error due to some small cell sizes) in bivariate analyses were then entered into a multivariate Cox model yielding adjusted hazard ratios and 95% confidence intervals. The proportional hazards assumption was tested by comparing estimated log–log survival curves across the categories of each predictor variable, and all curves were parallel within variables

suggesting that the proportional hazards assumption was satisfied.

## RESULTS

### Demographic and HIV Risk Profile of Participants

There were a total of 1426 youth included in these analyses, with 914 females and 512 males. Table I presents client background and service receipt characteristics for each gender group. Males tended to be older than females, and were more likely to be White non-Hispanic, GLBU, or HIV-positive.

The profile of participants, as shown in Table I, was that of a high-risk, typically hard-to-reach population. Many were homeless, or involved with the mental health system. Equal proportions of males and females reported having ever engaged in substance abuse, IDU, or needle-sharing, or in risky sex (IDU or HIV+ partners, or survival sex). Females reported higher rates of other types of HIV risk, with over half reporting unprotected sex with males, over one quarter reporting ever having had an STD, and 1 in 10 reporting having ever been pregnant. The 37 participants who tested positive for HIV were the most vulnerable, with 52% of HIV+ males and 25% of HIV+ females reporting homelessness; 29 and 44% reporting substance abuse behaviors; and 43 and 75% reporting high-risk sexual activities (sex with IDU or HIV+ partners, or survival sex), respectively.

### Service Characteristics

As shown in Table I, the majority of HAPPENS clients in both gender groups first entered the program through the multiservice outreach agency sites. Males, however, were significantly more likely to enter care through an outreach agency than females, while females were more likely to enter care through community health centers and hospitals. Once they entered the program, the number of client visits ranged from 1 to 89 among males, and from 1 to 133 among females. Visits were largely for medical care, with 72% of all visits among males and 70% among females involving medical care provision.

The majority of HAPPENS clients in both gender groups received both outreach or case management services at least once, and approximately one out of six received some MH counseling service. Males were

**Table I.** Subject Background Characteristics and Service Receipt, by Gender ( $N = 1426$ )

	Males		Females		$\chi^2$ or $F$ statistic	$p$ Value
	$n$	%	$n$	%		
Number of Clients	512	35.9	914	64.1	—	—
Age (mean years $\pm$ SD)	20.4 $\pm$ 3.0		19.4 $\pm$ 2.9		$F = 39.8$	<0.001
Race/Hispanic ethnicity						
White non-Hispanic	275	56.9	401	45.4		
Black non-Hispanic	91	18.8	207	23.4		
Hispanic	83	17.2	194	22.0		
Asian/other	34	7.1	81	9.2	16.6	0.002
HIV positive	21	4.1	16	1.8	7.2	0.007
Gay, lesbian, bisexual, or undecided	112	21.9	63	6.9	68.4	<0.001
Homeless and/or runaway	77	15.0	131	14.3	0.1	ns
Mental health system—involved	108	14.2	165	12.3	1.6	ns
Pregnant	—	—	104	11.4	—	—
Ever had STD	57	11.4	251	27.9	51.0	<0.001
Unprotected sex with males	58	11.7	540	59.1	297.0	<0.001
Unprotected sex with females	131	26.1	32	3.6	158.3	<0.001
Other high-risk sex behaviors <sup>a</sup>	27	5.6	56	6.1	0.4	ns
Substance abuse behaviors <sup>b</sup>	43	8.4	74	8.1	1.4	ns
Initial site of care						
Multiservice outreach agency	361	70.6	420	46.0		
Community health center	51	10.0	219	24.0		
Hospital	99	19.4	275	30.1	84.6	<0.001
No. of total visits						
One	229	44.7	382	41.8		
Two	123	24.0	247	27.0		
Three or more	160	31.3	285	31.2	1.8	ns
No. of times received outreach						
None	205	40.0	450	49.2		
One	216	42.2	332	36.3		
Two or more	91	17.8	132	14.5	11.3	0.004
No. of times received case management						
None	205	40.0	326	35.7		
One to two	263	51.4	513	56.1		
Three or more	44	8.6	75	8.2	3.1	ns
No. of times received MH counseling						
None	441	86.1	737	80.6		
One	41	8.0	141	15.4		
Two or more	30	5.9	36	4.0	18.0	<0.001

Note. ns: Statistically nonsignificant,  $p > 0.10$ .

<sup>a</sup>Reported ever having survival sex, sex with HIV+ partner, or sex with injection drug user.

<sup>b</sup>Reported ever injecting drugs, needle-sharing, or abusing substances.

more likely than females to have received outreach services at least once, and less likely to have received any MH counseling. However, among clients who received any MH counseling, males had a higher frequency of mental health visits than females (58% with 3 or more visits vs. 11%,  $p < 0.001$ ).

### Predictors of Retention in Care

Females tended to have longer retention times than did males (median = 26 days vs. 21 days, log-rank statistic = 5.2,  $p = 0.02$ ). There were also some

differences by gender in the factors that were associated with program retention (Tables II and III).

### Males

Among the 512 male clients, program retention times ranged from 0 to 1406 days with the retention times of 117 clients (23%) being treated as censored in the analyses due to their having had a visit during the final year of data collection. In Kaplan-Meier analysis, the cumulative probability of being retained beyond the initial visit for males was 64%, with 45% being

**Table II.** Cox Proportional Hazards Regression Results for Males: The Effect of Background and Service Factors on Probability of Program Retention Over Time

Variable	Bivariate analysis			Multivariate model		
	Unadjusted hazard ratio	95% CI	<i>p</i> value	Adjusted hazard ratio <sup>a</sup>	95% CI	<i>p</i> Value
Age (years)	1.02	0.94–1.11	ns	1.02	0.93–1.11	ns
Race <sup>b</sup>						
White non-Hispanic	Reference	Reference		Reference	Reference	
Black non-Hispanic	1.04	0.88–1.22	ns	1.18	1.06–1.32	0.009
Hispanic	1.06	0.78–1.45	ns	1.16	1.09–1.24	<0.001
Asian/other	0.65	0.59–0.71	<0.001	0.65	0.46–0.93	0.023
HIV positive <sup>b</sup>	0.23	0.10–0.53	0.003	0.60	0.47–0.76	0.001
GLBU <sup>b</sup>	0.40	0.27–0.60	<0.001	0.61	0.34–1.12	ns
Homeless and/or runaway <sup>b</sup>	0.71	0.50–1.01	0.057	1.06	0.88–1.28	ns
MH system-involved <sup>b</sup>	0.83	0.66–1.03	0.085	0.81	0.68–0.97	0.003
Ever had STD	1.02	0.71–1.45	ns	—	—	—
Unprotected sex with females	1.06	0.91–1.22	ns	—	—	—
High-risk sexual behaviors <sup>b,c</sup>	0.43	0.27–0.67	0.002	0.65	0.47–0.90	<0.001
Substance abuse behaviors <sup>d</sup>	0.71	0.38–1.34	ns	—	—	—
First site of care						
Outreach agency	Reference	Reference				
CHC	1.21	0.92–1.57	ns	—	—	—
Hospitals	1.17	0.98–1.39	ns	—	—	—
Outreach contacts <sup>b</sup>						
None	Reference	Reference		Reference	Reference	
One	1.15	0.95–1.41	ns	1.38	1.14–1.68	0.005
Two or more	0.42	0.33–0.53	<0.001	0.64	0.57–0.73	<0.001
Case management visits <sup>b</sup>						
None	Reference	Reference		Reference	Reference	
One to two	0.98	0.75–1.27	ns	1.08	0.92–1.26	ns
Three or more	0.27	0.22–0.33	<0.001	0.57	0.46–0.69	<0.001
MH counseling visits <sup>b</sup>						
None	Reference	Reference		Reference	Reference	
One	0.80	0.61–1.07	ns	0.83	0.61–1.13	ns
Two or more	0.28	0.14–0.55	0.002	0.66	0.54–0.80	<0.001

<sup>a</sup>Adjusted for all other variables shown.

<sup>b</sup>Variables with unadjusted hazard ratios meeting  $p < 0.10$  criteria were entered into the multivariate model.

<sup>c</sup>Any history of survival sex, sex with an injection drug user, sex with an HIV+ partner, or (for males only) unprotected sex with males.

<sup>d</sup>Any history of substance use, injection drug use, or needle sharing.

retained beyond a month, 24% beyond a year, and 10% beyond 2 years.

The outreach, case management, and mental health counseling variables were all significant predictors of program retention in bivariate analyses. As shown in Fig. 1, male participants receiving outreach services  $\geq 2$  times had a significantly higher probability of retention over time than did those receiving outreach once (log-rank = 56.9,  $p < 0.001$ ) or not at all (log-rank = 45.1,  $p < 0.001$ ). Those receiving outreach  $\geq 2$  times had a median retention time of 420 days, compared to 21 days among those with no outreach, and 1 day among those receiving outreach once. Moreover, about half (51%) of males receiving outreach  $\geq 2$  times had retention times of at least a

year, compared to 21 and 13% of those receiving none or one time, respectively. Retention times did not differ statistically for those receiving outreach once or not at all.

The pattern was similar for MH counseling. Male participants who received MH counseling services at  $\geq 2$  visits had a significantly higher probability of retention over time than did those with one (log-rank = 12.8,  $p < 0.001$ ) or no such visit (log-rank = 34.8,  $p < 0.001$ ), while the latter two groups were not different from each other. Median retention times were 767, 6, and 21 days, respectively. A majority (59%) of the  $\geq 2$  visit group was retained for at least 1 year, compared to only 27 and 20% among the other two groups, respectively.

**Table III.** Cox Proportional Hazards Regression Results for Females: The Effect of Background and Service Factors on Probability of Program Retention Over Time

Variable	Bivariate analysis			Multivariate model		
	Unadjusted hazard ratio	95% CI	<i>p</i> value	Adjusted hazard ratio <sup>a</sup>	95% CI	<i>p</i> Value
Age (years)	1.02	0.97–1.07	ns	1.00	0.95–1.05	ns
Race <sup>b</sup>						
White non-Hispanic	Reference	Reference		Reference	Reference	
Black non-Hispanic	1.01	0.79–1.29	ns	1.11	0.97–1.27	ns
Hispanic	0.86	0.67–1.08	ns	1.01	0.82–1.26	ns
Asian/other	0.71	0.53–0.95	0.025	0.77	0.54–1.11	ns
HIV positive <sup>b</sup>	0.29	0.13–0.64	0.006	0.70	0.30–1.66	ns
GLBU <sup>b</sup>	0.61	0.50–0.74	<0.001	0.50	0.41–0.61	<0.001
Homeless and/or runaway	0.71	0.46–1.10	ns	—	—	—
MH system-involved	0.74	0.49–1.12	ns	—	—	—
Pregnant <sup>b</sup>	0.58	0.32–1.05	0.069	0.64	0.37–1.11	ns
Ever had STD	0.71	0.41–1.22	ns	—	—	—
Unprotected sex with males <sup>b</sup>	0.74	0.63–0.85	0.001	0.61	0.49–0.78	0.001
High-risk sexual behaviors <sup>c</sup>	0.56	0.25–1.22	ns	—	—	—
Substance abuse behaviors <sup>d</sup>	0.57	0.24–1.37	ns	—	—	—
First site of care						
Outreach agency	Reference	Reference				
CHC	0.93	0.82–1.06	ns	—	—	—
Hospitals	1.21	0.91–1.62	ns	—	—	—
Outreach contacts <sup>b</sup>						
None	Reference	Reference		Reference	Reference	
One	1.28	0.88–1.85	ns	1.32	1.09–1.61	0.011
Two or more	0.60	0.47–0.77	0.001	0.72	0.61–0.85	0.002
Case management contacts <sup>b</sup>						
None	Reference	Reference		Reference	Reference	
One to two	0.99	0.67–1.45	ns	1.06	0.75–1.50	ns
Three or more	0.41	0.26–0.64	0.002	0.54	0.34–0.84	0.013
MH counseling visits <sup>b</sup>						
None	Reference	Reference		Reference	Reference	
One	0.80	0.52–1.23	ns	0.95	0.61–1.50	ns
Two or more	0.36	0.13–0.98	0.046	0.59	0.18–1.92	ns

<sup>a</sup>Adjusted for all other variables shown.

<sup>b</sup>Variables with unadjusted hazard ratios meeting  $p < 0.10$  criteria were entered into the multivariate model.

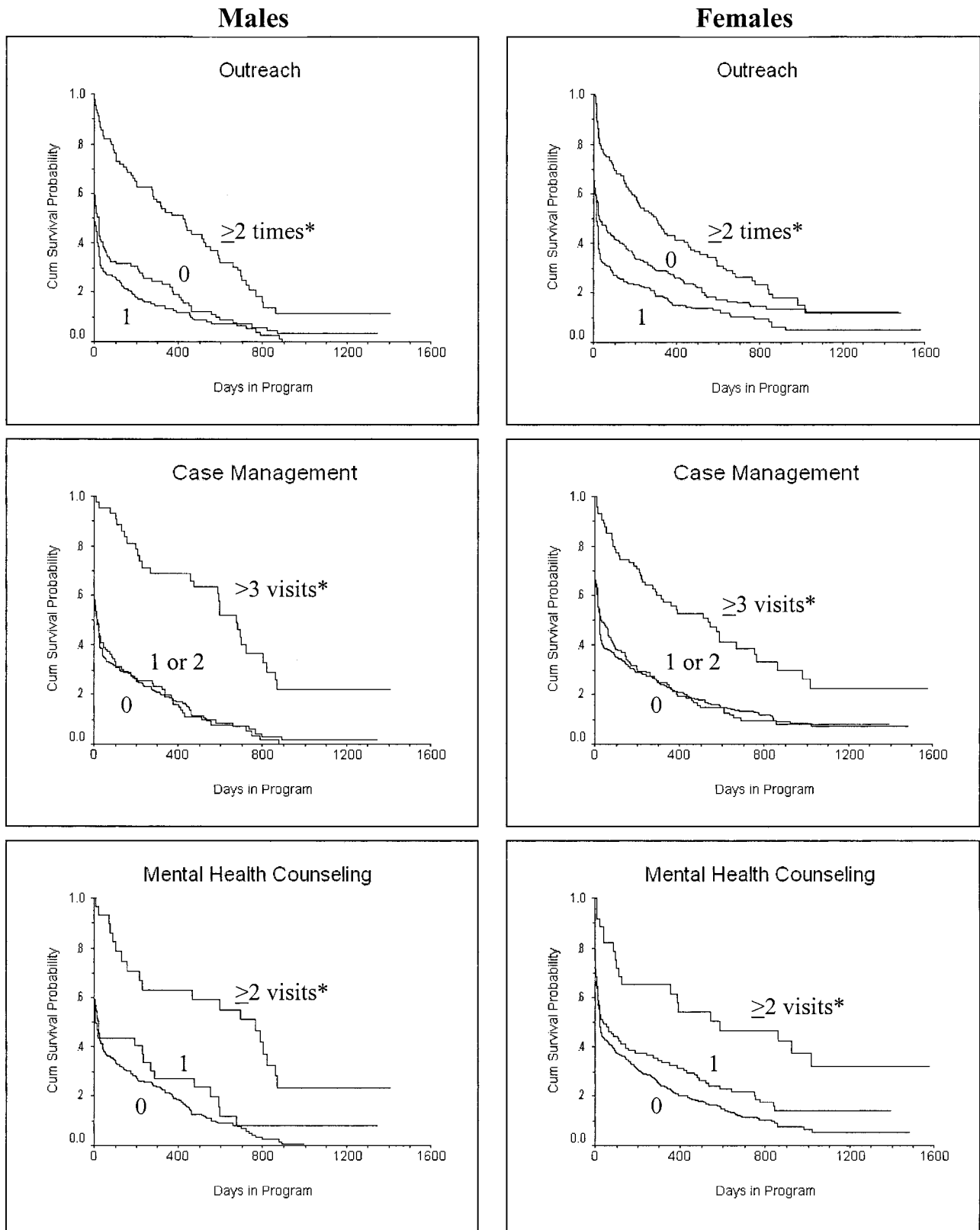
<sup>c</sup>Any history of survival sex, sex with an injection drug user, sex with an HIV+ partner, or (for males only) unprotected sex with males.

<sup>d</sup>Any history of substance use, injection drug use, or needle sharing.

The threshold for increased retention was slightly higher for case management services with probability of retention highest among male participants receiving case management services  $\geq 3$  times, compared to those receiving them once or twice or not at all (log-ranks for both comparisons = 38.2,  $p < 0.001$ ). About two-thirds (66%) of those with  $\geq 3$  times were retained for at least 1 year (median = 676 days), compared to 18% of those with fewer times (median = 15 days). As shown in Fig. 1, the survival curve for those receiving case management once or twice is almost indistinguishable from the curve of those with no case management.

Table II presents the results of entering the three service variables into a Cox proportional hazards regression model for males, controlling for the effects of other significant client background variables (meeting criteria of  $p < 0.10$  in bivariate analysis). In adjusted analyses, all three service variables remained significant independent predictors of retention in care among male participants. Males had significantly longer retention times if they had received outreach  $\geq 2$  times, case management  $\geq 3$  times, or had  $\geq 2$  MH counseling visits. Client-related factors that predicted longer retention times included being HIV+, of “Other” race, involved in the MH system, or





**Fig. 1.** Gender-specific Kaplan-Meier survival probability curves by number of times client received each type of service. \*Clients receiving outreach or mental health counseling  $\geq 2$  times, or case management  $\geq 3$  times had significantly longer survival times (all log-rank tests  $p < 0.001$ ) compared to all other clients.

having a history of risky sex. On the other hand, black non-Hispanic and Hispanic male participants had significantly shorter retention times than did white non-Hispanic males. Participants with a single outreach encounter were also less likely to be retained over time than were those who received no outreach.

In models testing for interaction and mediation, there was evidence of a synergistic effect of receiving both outreach and case management services on retention among males; clients having  $\geq 2$  outreach contacts *and* case management on  $\geq 3$  occasions had a greater likelihood of being retained over time than would be expected without the interaction effect (interaction adjusted HR = 0.50, 95% CI 0.33–0.76,  $p = 0.005$ ). This interaction effect was not observed for other pairwise combinations of the three service variables, nor for the three-way interaction term (Outreach  $\times$  Case Management  $\times$  Mental Health Counseling).

There was no interaction effect between the service variables and HIV status; males receiving more of the three types of support services were likely to be retained longer in care among both HIV+ and HIV– or untested clients. Moreover, the effect of outreach and case management on retention seemed to be independent of the number of medical visits (all visits for medical or family planning services) made by a client; i.e., these variables were significant predictors of retention among those with fewer visits as well as among those with more frequent visits. The MH counseling variable, however, lost statistical significance when adjusting for medical visits; the beta coefficient changed from  $-0.42$  ( $p = 0.002$ ) to  $-0.37$  ( $p = 0.14$ ), indicating that the number of medical visits may be a confounder.

### Females

Program retention times ranged from 0 to 1577 days among the 914 female clients, with 273 (30%) censored cases. The cumulative probability of being retained beyond the first visit for females was 70%, with 48% retained beyond 1 month, 25% beyond a year, and 15% beyond 2 years.

Kaplan-Meier survival curve analysis of the three service variables yielded results similar to that found for males (Fig. 1). Female participants receiving outreach  $\geq 2$  times had a significantly longer median retention time of 301 days, compared to 14 and 28 days for those receiving outreach once or not at all (log-ranks = 51.9 and 20.6, respectively, both

$p < 0.001$ ). In addition, retention times were significantly longer among females with no outreach than among those with a single outreach encounter (log-rank = 9.4,  $p = 0.002$ ). Among females with one outreach encounter, only 16% were retained beyond a year, compared to 27 and 41% among those receiving outreach not at all or at least two times, respectively.

Females with  $\geq 2$  MH counseling visits had a median retention time of 585 days, compared to 42 days among those with one such visit, and 21 days among those with none. More than half (58%) of those receiving  $\geq 2$  MH counseling visits were retained for at least a year, compared to one third (32%) and one fifth (22%) of those with only one or no such visit, respectively. In log-rank tests, retention times differed significantly across all three groups ( $\geq 2$  visits  $> 1$  visit (log-rank = 11.1,  $p = 0.009$ ); 1 visit  $>$  none (log-rank = 4.5,  $p = 0.03$ )).

Similar to males, receipt of case management on  $\geq 3$  occasions was associated with the longest retention times for females, with a median of 534 days, compared to 21 and 33 days for those receiving it once or twice, or not at all, respectively (log-ranks for both comparisons = 38.0,  $p < 0.001$ ). The survival curves of the latter two groups were not different; the proportion being retained beyond a year was the same for these two groups (21%). In comparison, the proportion was more than double (54%) among those who received case management at  $\geq 3$  visits.

As shown in Table III, the outreach and case management variables remained significant independent predictors of retention for females after adjusting for the effect of other significant client background variables in a multivariate Cox model, while MH counseling did not. Female participants had significantly higher probabilities of retention over time if they had received outreach  $\geq 2$  times, case management on  $\geq 3$  visits, if they self-identified as GLBU, or reported having unprotected sex with males. Similar to males, females receiving both more outreach ( $\geq 2$  times) and more case management ( $\geq 3$  times) had significantly greater likelihood of being retained over time than would be expected without an interaction effect (interaction adjusted HR = 0.41, 95% CI 0.19–0.88,  $p = 0.03$ ). In addition, these results were not modified by the HIV status of female clients. However, the association between case management and retention among females may be confounded by the number of medical visits; the beta coefficient changed from  $-0.64$  ( $p = 0.009$ ) to  $-0.18$  ( $p = 0.44$ ).

## DISCUSSION

This study is one of the first to empirically examine the effect of outreach, case management, and mental health counseling services on retention of at-risk adolescents and young adults in primary and preventive care. Findings from this study suggest that, with intensive effort, some youth who are traditionally the hardest to reach and to keep in consistent care can be retained in care. In the HAPPENS program, a comprehensive, linked-services system of care serving high-risk youth, over half of clients returned for at least one additional visit, and one out of four was retained for over a year. Intensive effort was involved in the care of HAPPENS clients, as indicated by the high proportion of clients (51% of females and 60% of males) who received outreach and case management services. This study demonstrates that such intensive effort may be vital to the care of high-risk, hard-to-reach youth. Clients had longer retention times if they received more of specific support services, regardless of their demographic or HIV risk characteristics or where they started care. Outreach services, which had previously been shown to play a vital role in getting clients initially into the HAPPENS program (42), were found in this study to be instrumental in keeping youth in the program over time. A number of previous studies corroborate the finding that outreach can be effective in linking youth to services (17–20, 25), but few previous studies have demonstrated the role of outreach in maintaining youth in care over time. This study's findings suggest that outreach is not only important in initially connecting hard-to-reach youth to services, but is also necessary for bringing them back for continued care over time. In fact, at least two outreach contacts were needed to significantly enhance retention in this study compared to having no outreach or only one outreach contact.

In these analyses, clients with only one outreach contact were the least likely to be retained over time, even after controlling for client characteristics such as being homeless or history of high-risk sexual activities such as survival sex. One possible explanation may be that some youth did not find the services that they wanted or needed at their initial contact with the outreach worker or other service provider, and did not feel any further motivation to seek services from the program. Another explanation may be that some youth were in the area for only a short period of time, just long enough for a single outreach contact. These transient youth are likely the most at-risk and

the most difficult to engage and retain in any system of care. A limitation of this study is that such factors as motivation to seek care, perceived need for the services offered, and other such youth-related characteristics that may confound or moderate the effect of program services on likelihood of retention were not measured.

This study adds to a growing body of research that supports the importance of case management services in improving the service and health outcomes of high-risk youth and young adults (26, 32–37, 46–49). Unlike most previous studies, however, this study assessed for, and found, a possible threshold effect for case management services, with only clients receiving case management on three or more occasions having significantly longer retention times compared to those never receiving case management. This higher threshold level suggests that establishing a relationship between the service provider and the client may be critical to client retention in care. However, this analysis did not include measures of provider–patient relationship quality, connectedness, or other provider-related factors, such as age, gender, race/ethnicity, or communication skills, that would allow exploration of the role of bond formation on client retention in care.

We found a strong synergistic effect when clients received more of both outreach and case management. That is, clients receiving more of both types of services had a significantly higher likelihood of retention than would be expected without the interaction effect. Therefore, a model of care which integrates both outreach and case management in a comprehensive continuum of care may be especially effective in retaining youth in care.

The impact of mental health counseling on retention in care was more difficult to ascertain in this study. Receiving mental health counseling services on at least two visits was associated with longer retention among both male and female HAPPENS clients in unadjusted analyses. However, mental health counseling was not an independent predictor of retention in adjusted analyses for females, indicating possible confounding or mediation by other factors in the model, or low statistical power to detect a significant difference due to small cell sizes. Moreover, the effect for males seemed to be confounded or mediated by the number of health care visits. The confounding may have occurred because mental health counseling was often integrated into a health care visit, as youth tended not to seek out mental health services separately but were more open to receiving counseling during their medical visits. Therefore, the effect

of mental health services on program retention could not be separated out from the effect of having more health care visits in these analyses.

Site of entry into the program was not a significant predictor of retention times in this study, although analyses reported in a previous study did find that the profiles of clients entering care through the different types of HAPPENS agencies varied significantly by type of site (42); clients entering through the multiservice outreach agencies were more likely to be substance-involved, GLBU, or have a history of high-risk sexual activities. However, in the present study, clients entering through the outreach agencies, who included the most high risk, hard-to-reach youth, had retention times similar to clients initially accessing care at the hospital clinics and community health centers. One possible explanation for this finding is that the high level of coordination and linkage of care for these clients across the network of HAPPENS sites resulted in sites working together to retain youth across the program, ameliorating the effect of initial site of care on retention.

Similar to other studies (25, 28–30), we found a number of patient background characteristics to be significant predictors of the likelihood of retention in care. Several previous studies indicated that gender was an important predictor of retention, as well as an effect modifier for other predictors (26–28). In this study, females tended to be retained longer in the HAPPENS program than males and had somewhat different predictors of retention than males. Probability of retention varied significantly by race/ethnicity among males, but not among females. Black non-Hispanic and Hispanic young men had a significantly greater risk of dropping out of the program than did young men of other race/ethnic backgrounds. Increased intensity of effort and/or more innovative strategies may be needed to keep these young men of color in care. On the other hand, females who were gay/lesbian, bisexual, or undecided tended to have longer retention times in the program than did other young women, whereas no such difference was seen among males.

A number of caveats should be kept in mind when considering the results of this study. Since we used a very broad measure of retention to accommodate the various types of care needs among HAPPENS clients, we are unable to say whether the retention times, the number or frequency of visits, or the care received, best met individual client needs or represented the most appropriate care. Future studies with larger numbers of participants should perform

analyses stratified by type of care needs so that the outcome measure could be more tailored to reflect retention in needed or appropriate care.

Also, we are unable to fully determine the direction of causality between the retention measure and the service predictor variables in this study, as retention times were highly correlated with the number of visits and clients with more visits had more opportunities to receive services. To assess whether the association of our service variables with increased retention times was primarily due to clients' having had more visits (confounding), we entered the number of medical visits into the final models and discovered that the effect of outreach and case management among males held regardless of the number of visits. Among females, however, only outreach remained a significant predictor of retention for females, with evidence that the effect of case management may be confounded by the number of medical visits. More prospective, longitudinal studies are needed to better determine the direction of causality by assessing whether receipt of support services at Time 1 predicts receipt of primary care at later time points.

The generalizability of this study's findings to other programs and other populations of youth may be limited because the multisite HAPPENS program is a unique model of care. Since multiple sites were involved in data collection, there was some variability in the quality and completeness of data collection across sites, particularly for the 1st year of data collection. Because data quality and completeness were improved after the 1st year, analyses were also conducted using only data from the second and subsequent years of data collection. The results did not differ from those obtained using the entire 4-year data set.

Finally, we may not have the whole picture of care received by our clients as visits to providers outside the HAPPENS program were not captured in our data. Clients not retained in the HAPPENS program may have continued to receive care from other sources. However, because many of the major health care providers in Boston were part of the HAPPENS network, we likely captured more of the overall picture of care received by our study participants compared to studies involving only a single program site.

## CONCLUSION

Information about factors that help connect high-risk youth to health services and help keep them in

care is critical to the development of appropriate and effective care systems. This study gives preliminary evidence that a more comprehensive, client-centered system of care that addresses a broader range of client needs through outreach, case management, and mental health services may have the best chance of effectively caring for youth and young adults with the highest risk of HIV infection, such as those in the HAPPENS client population. With these additional programmatic services, these youth who historically had very episodic care appeared to be able to access consistent care. More studies are needed to identify other factors that may help to keep at-risk youth in needed care, as well as to further elucidate the role of support services in improving their retention in care.

We found that a threshold of at least two to three client contacts with providers needed to be met in order for the services studied to have an impact on client retention in care. This finding suggests that program providers need to provide these services in an ongoing, consistent way so as to promote youth-provider bond formation. However, these support services are currently inadequately reimbursed by insurers, with consistent national or state funding of these services available only for individuals who are already HIV+, and even that funding is threatened by current budget cuts. Development of more effective systems of care for at-risk youth, who are traditionally harder to engage and retain in care, requires continued financial support for outreach, case management, and mental health services.

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Uplander Way, Culver City, CA 90230, or available on their Web site: [www.themeasurementgroup.com](http://www.themeasurementgroup.com).

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