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HIV Services Utilization in Los Angeles County, California

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Abstract Recipients of HIV/AIDS prevention services in Los Angeles County California were surveyed in 2004 by 220 HIV prevention service provider staff from 51 agencies funded by the Office of AIDS Programs and Policy. This resulted in 2,102 usable surveys for cluster analysis purposes. This Countywide Risk Assessment Survey assessed demographics, sexual history, substance use, perceptions regarding HIV/AIDS, and use of 18 different services at both the agency administering the survey and at other agencies. The 36 types of service use data were subjected to a cluster analysis that found five clusters. These service pattern clusters differed from each other on proportion HIV positive, HIV testing history, history of abuse, education, type of residence, type of funding, intervention type, and ethnicity. The analysis also suggests that domestic violence services availability and utilization should be examined more thoroughly in the future for HIV infected/affected populations.

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Introduction

Determining patterns of service usage among at-risk or HIV/AIDS—affected populations is one way to evaluate whether, and to what extent, these services are being accessed. Such determinations can assist with program planning and inform decisions concerning the use of scarce funding resources. They can also assist program monitors to provide technical assistance to prevention programs.

While most studies in this area looked at groups of persons with HIV/AIDS and their service access patterns, fewer studies exist that have looked at accessing services associated with HIV prevention. Huba et al. (2000) using data from the Special Projects of National Significance Program evaluated several programs that were targeted specifically to youth at high risk for acquiring HIV. Integrated service delivery networks were used to develop differentiated paths of service that occurred among the youth accessing services. Findings suggest that there are many entry points into these integrated service delivery systems, and that specific patterns of usage can be identified based on the entry point.

HIV-positive persons have been found to have different patterns of service usage (Smith et al. 2000), with homeless persons using more outpatient physician services, and unstably housed persons being more likely to use emergency room services when in need of medical care. One study of HIV-positive women addressed both perceived and actual barriers to receiving services, and found that projects designed to reduce barriers were, in fact, able to do this (Brown et al. 2000). These studies were published

using cohorts of individuals who were diagnosed with HIV/AIDS prior to the availability of highly active anti-retroviral therapy (HAART), and not surprisingly found that poor physical health and low levels of physical functioning were associated with greater use of services available in the community, including food, medical, case management, counseling, housing and transportation services.

Getting HIV-positive clients linked to medical-care services once HAART became available has been shown to have an impact on the clients' use of other services, especially for community-based service providers. One such study, conducted in Boston, found that first CD4 count, viral load, insurance status, and being on combination therapy were predictors of the use of primary care services (Lo et al. 2002). Another study found few significant differences between users of community-based services and those who did not use those services (Saunders and Burgoyne 2001). Those individuals who used the services were more likely to report lower quality of life due to pain and fewer opportunities for positive social interactions. In California, among older adults diagnosed with symptomatic HIV and AIDS, physical disability and need were associated with home health care, and low physical functioning was associated with use of medical services (Emlet and Farkas 2002). This study also found high service usage among those in rural, as well as urban, geographic locations, contrary to other reports that individuals in rural areas use fewer services due to isolation.

Several studies have explored the service usage patterns of HIV-positive individuals, both before and after the introduction of highly active anti-retroviral therapies as the standard of care. Categorizing services as: skilled services, chore services or physician services, McCormick et al. (1993) found that functional health status was associated with greater use of these services. In addition to poorer health and lower functional status, these researchers found service usage to be highest among those with the lowest incomes and those who lived alone or those who did not live alone but had no one to act in a support role.

The purpose of this study is to use the results of a survey done among HIV positive and high-risk negative individuals who receive services from providers contracted by the Office of AIDS Programs and Policy (OAPP), Department of Public Health, in Los Angeles County to make recommendations concerning: (1) targeting funding and service combinations, (2) developing Memoranda of Understanding (MOUs) for service provision that would also be reflected in: (3) expectations for linked referral patterns, and (4) the provision of technical assistance by OAPP program monitors. Specifically, we construct patterns of service utilization (expressed as clusters) and model descriptors of these service utilization clusters.

Methods

The OAPP conducts an annual risk assessment survey in collaboration with the Los Angeles HIV Prevention Planning Committee, to learn more about clients receiving HIV prevention services in Los Angeles County, CA. Information gathered from this Countywide Risk Assessment Survey (CRAS) is used to prioritize funding for HIV prevention in Los Angeles County, CA and to find better ways to provide HIV prevention services to prevent the transmission of HIV. Data were collected in May and June of 2004 by 220 HIV prevention service provider staff from 51 OAPP-funded agencies. Surveys were conducted across Los Angeles County, CA representing a 4,000 square mile area, which includes urban, suburban and rural areas.

Out of 2,514 expected surveys, interviewers completed 2,126 surveys (84.6% completion rate). This is a better response rate than the 70–75% response rate typical for uncomplicated face-to-face surveys carried out by non-government survey organizations (Kalton 1983). Some of the surveys had missing data on critical variables, which left 2,102 for cluster analysis purposes. Surveys were administered face-to-face in various settings including community-based organizations, medical facilities, drug treatment centers, HIV testing sites, and prevention outreach sites. All interviewers completed a 6 h training on administering the survey, which included sampling methodology, confidentiality, and interviewing techniques. In addition, interviewers were certified in the Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulations and the protection of human research subjects. For more on the methodology see Edwards et al. (2007).

The CRAS assessed demographics (including race, age, sex, education, sexual orientation, living situation) as well as information regarding sexual history (with primary partners or causal partners, sex under the influence), substance use (past 6 months, next 6 months), utilization of HIV prevention services, and perceptions regarding HIV/AIDS. The question on partner violence was "Has your partner or any of your partners ever slapped or hit you?" In addition, the survey captures perceptions of risk behaviors including sharing injection needles, and condom use with main and casual sex partners. We were also able to obtain two variables that described the type of program that was doing the interviewing. One was intervention type (individual, group, outreach, and prevention case management), and the other was contract type (health education risk reduction or HERR, HIV counseling and testing or HCT, HIV treatment adherence programs, and prevention programs for HIV-positive individuals). For this analysis, data on two sets of questions included in the CRAS were used as measures of service utilization. One set started with the question "Did you in the PAST SIX MONTHS receive

Table 1 Correlation matrix of cluster by split

Cluster	1	2	3	4	5
1R	.966	.468	.517	.570	.551
2R	.629	.188	.948	.102	.684
3R	.236	.667	.005	.769	.525
4R	.271	.233	.355	.489	.804
5R	.300	.331	−.199	.776	.530

Note The cluster numbers with an R suffix are the clusters in the second (replication) half sample

from my agency…?" A list of 18 different possible services was then read to the participant. The second set started with the question "Did you in the PAST SIX MONTHS receive from any OTHER AGENCY in L.A. County besides this one?" The same list of 18 possible services was then read (See Table 1). Administration of the survey included an informed consent form, which was read verbatim to each participant. Interviews lasted between 15 and 30 min. Research staff from OAPP provided ongoing technical assistance to interviewers and agencies including site visits to monitor data collection, data security, and adherence to protocols.

Two-tiered sampling was employed, which included both stratified and systematic sampling. Stratified sampling was chosen because it was believed that there were differences in client characteristics among the different agencies. Therefore, agencies were assigned to one of three strata based on the estimated number of clients served annually. Systematic sampling was utilized to facilitate a random sample of participants. Interviewers were given a number (*n*) and were asked to interview every *n*th client participating in an individual-level intervention, group-level intervention, outreach encounter, or prevention case management encounter with agency staff.

Complete data from 2,102 responses were obtained in the total sample. The mean age of the participants was 32.7 (SD = 10.99) years and ranged from 12 to 69 years. The racial/ethnic mix was 46% Latino, 27% African-American, 17% White, 6% Asian/Pacific Islander, 3% Native American and 1% Other. Of the participants over 18 years of age, approximately 35% reported that they had not received at least a high school diploma.

To establish profiles of service utilization, a cluster analysis was performed on the 36 binary variables of services that were described above. We divided the sample randomly into two half samples and did the same cluster analysis procedure on each half. The cluster analysis was performed in Clustan (Wishart 2006) using hierarchical divisive clustering. This type of monothetic divisive strategy has been advocated for use with binary data (Aldenderfer and Blashfield 1984). The procedure begins with all the observations in a single cluster. The procedure

calculates which optimal variable to use to split the cluster into subsets to maximize the reduction in the Euclidean Sum of Squares calculated over all variables. The two resulting clusters are then examined for the best further optimal split to reduce the Euclidean Sum of Squares. It continues splitting until no further splits are possible, thereby obtaining a complete division hierarchy (Wishart 2006). We compared the five-cluster solution in each sample to each other using Pearson correlations on the cluster profiles. This correlation matrix is presented in Table 1 and described in the "Results" section.

In order to distinguish among the clusters we constructed a generalized logit model using cluster as values of the multinomial dependent variable and other behavioral, demographic, program, and attitudinal variables as candidate variables for the construction of the generalized logit model (Hosmer and Lemeshow 2000; McFadden 1974). Cluster 4 ("Low Use" cluster) which had the lowest usage of all services was used as the reference cluster. It was arbitrarily chosen to be the reference cluster because we wanted to see what characteristics were associated with the different patterns of service utilization for increased levels of utilization as represented by the other utilization patterns. The generalized logit model compared each of the other clusters to cluster 4 "Low Use." We only report those explanatory variables which were significant for each model in the table to simplify the presentation even though the multivariate estimation included all of the explanatory variables.

Results

Table 1 shows a correlation matrix of each cluster in sample 1 (half of the total sample) compared to each cluster in sample 2 (other half of the total sample). Sample 2, or the second (replication) half sample, is denoted with an "R" after each number. The numbers are arbitrary. The table shows a very good robust structure to the cluster analysis in that most of the clusters in sample 1 have a high correlation with one cluster in sample 2. Cluster 1 is correlated with cluster 1R at .966. Cluster 2 is correlated with cluster 3R at .667. Cluster 3 is correlated with cluster 2R at .948. Cluster 4 is correlated with cluster 3R at .769. Cluster 5 is correlated with cluster 4R at .804. Overall, the data show very good replicability of the cluster analysis with the exception that both cluster 2 and cluster 4 are correlated highest with cluster 3R. The remainder of our analyses are based on cluster definitions from the entire sample.

Figure 1 shows the cluster profiles. The vertical axis represents the percent of respondents who said that they received the service enumerated simply as numbers on the horizontal axis (going from 1 to 36). The 1–18 service questions refer to services received at the agency doing the

Fig. 1 Percentage service utilization by cluster
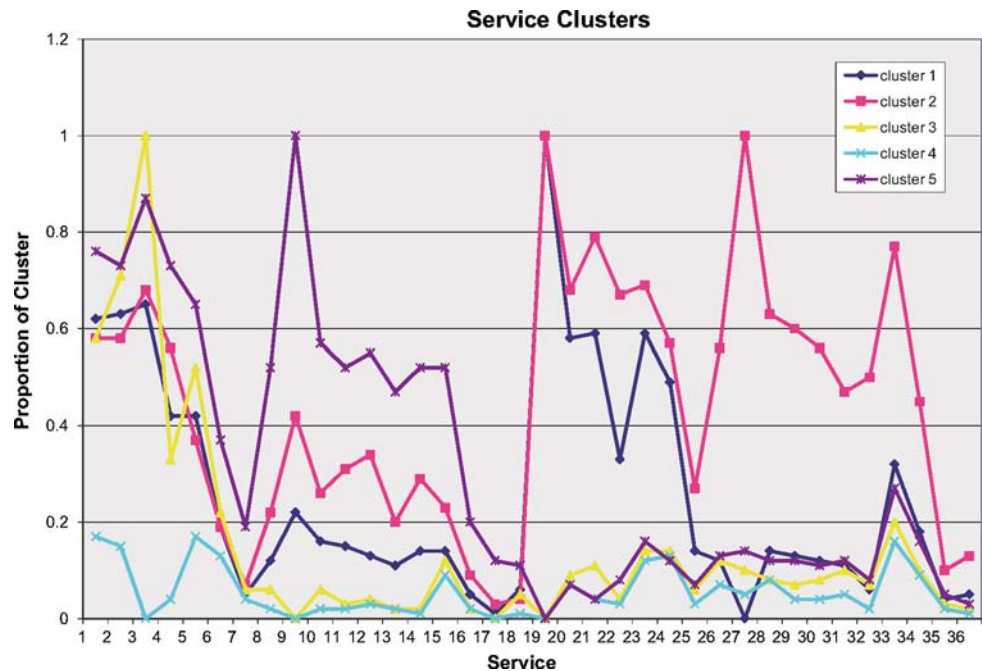
survey. The 19–36 service questions refer to the same 18 services but received at any other agency in L.A. County. The 18 services and the proportion who endorsed the service by each cluster are listed in Table 2. We give descriptive names for the profiles that are shown in Fig. 1. The profile for cluster 1 we term "Education Elsewhere" because while it shows some use of HIV information, education and testing (the peak is 19 which is "HIV information where you came to an office or clinic" but obtained elsewhere) and low use of other services at the agency doing the survey, it also shows fairly extensive use of education/prevention services at other agencies. The profile for cluster 2 we term "Most Other Elsewhere" shows use of most services at the agency doing the survey, but much more so at other agencies (it has two peaks at 19 which is "HIV information where you came to an office or clinic" and 27 "Case management" but both were from somewhere else). The profile for cluster 3 we are labeling "Education Here" because it shows use of education/prevention services at the agency doing the survey (the peak is "HIV education to promote behavior change" which is number 3), but very little use of other services at that agency and very low use of services at other agencies. The profile for cluster 4 is our referent cluster and we are naming it "Low Use" because it shows low use of all services. The profile for cluster 5 "Most Here" shows extensive use of services at the agency doing the survey (the peak is 9 which is "Case management") and low use of services at other agencies.

The combined data for the entire sample show that, overall, the services that were received from the agency doing the surveys were more likely to be HIV education to promote behavior change, HIV information from discussion leader or outreach worker, and HIV information from the office. The services that were received from other agencies were most likely to be HIV information from the office, HIV testing and counseling, and medical services. The services least likely to be obtained from the agency doing the survey were child welfare services, needle exchange, and dental services. The services least likely to be obtained from other agencies were child welfare services, needle exchange, and STD treatment. These overall findings appear to be consistent for both the agency doing the interviewing and other agencies.

Cluster 4 (Low Use) had the lowest use of services. In order to describe characteristics of those classified into each cluster on attributes other than service utilization, we conducted a generalized logit model comparing each cluster (more service usage) to cluster 4 (Low Use) which was used as the reference cluster (McFadden 1974). This designation was arbitrary and was used because we wanted to show the characteristics that are associated with increased service utilization as represented by the clusters. Using the lowest service use cluster for reference in this case appears to perform this function.

Table 3 shows the results of each cluster to the reference cluster 4 (Low Use). Individuals in cluster 1 (Education Elsewhere) are more likely to be HIV positive, to have had a recent HIV test, and to have been slapped or hit by a partner. They are more likely to be Hispanic or Black. Even though they have had a recent HIV test, they are less likely to have been surveyed by an HCT contractor.

Individuals in cluster 2 (Most Other Elsewhere) are much more likely than those in cluster 4 (Low Use) to be HIV positive, to have had a recent HIV test, and to have been

Table 2 Proportion by cluster

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Did you in the past 6 months receive from my agency					
1. HIV information where you came to an office or clinic	.62	.58	.58	.17	.76
2. HIV information where someone came to you	.63	.58	.71	.15	.73
3. HIV education to promote behavior change	.65	.68	1	0	.87
4. HIV social support, like, in a group meeting	.42	.56	.33	.04	.73
5. HIV testing/counseling	.42	.37	.52	.17	.65
6. STD testing	.19	.19	.22	.13	.37
7. STD treatment	.05	.07	.06	.04	.19
8. Drug/alcohol treatment	.12	.22	.06	.02	.52
9. Case management	.22	.42	0	0	1
10. Mental health or psychosocial support	.16	.26	.06	.02	.57
11. Transportation	.15	.31	.03	.02	.52
12. Housing/shelter information	.13	.34	.04	.03	.55
13. Housing/shelter	.11	.2	.02	.02	.47
14. Treatment adherence counseling	.14	.29	.02	.01	.52
15. Medical services	.14	.23	.12	.09	.52
16. Dental services	.05	.09	.02	.02	.2
17. Child welfare services	.01	.03	0	0	.12
18. Needle exchange	.06	.04	.05	.01	.11
Did you in the past 6 months receive from any other agency in L.A. County besides this one?					
19. HIV information where you came to an office or clinic	1	1	0	0	0
20. HIV information where someone came to you	.58	.68	.09	.07	.07
21. HIV education to promote behavior change	.59	.79	.11	.04	.04
22. HIV social support, like, in a group meeting	.33	.67	.04	.03	.08
23. HIV testing/counseling	.59	.69	.14	.12	.16
24. STD testing	.49	.57	.14	.13	.12
25. STD treatment	.14	.27	.06	.03	.07
26. Drug/alcohol treatment	.12	.56	.12	.07	.13
27. Case management	0	1	.1	.05	.14
28. Mental health or psychosocial support	.14	.63	.08	.08	.12
29. Transportation	.13	.6	.07	.04	.12
30. Housing/shelter information	.12	.56	.08	.04	.11
31. Housing/shelter	.11	.47	.1	.05	.12
32. Treatment adherence counseling	.06	.5	.07	.02	.08
33. Medical services	.32	.77	.2	.16	.27
34. Dental services	.18	.45	.1	.09	.16
35. Child welfare services	.04	.1	.03	.02	.05
36. Needle exchange	.05	.13	.02	.01	.03

slapped or hit by a partner, which is similar to cluster 1 (Education Elsewhere). This cluster is the only one that is more likely to be Native American as compared to White. They are also more likely to be Hispanic and Black as compared to White. Those in cluster 2 (Most Other Elsewhere) also have less education and are less likely to be White, similar to cluster 1 (Education Elsewhere). However, cluster 2 (Most Other Elsewhere) also has some housing variables that distinguish it from cluster 4 (Low Use).

Individuals in cluster 3 (Education Here) compared to cluster 4 (Low Use) are more likely to be Black or Hispanic compared to White and to have less education. This cluster is less likely to report being sexually abused. They are also more likely to have been in a group intervention compared to an individual-level intervention or outreach encounter.

Individuals in cluster 5 (Most Other Here) compared to cluster 4 (Low Use) are more likely to be HIV positive, to

Table 3 Generalized logit model cluster comparison to reference cluster 4 "Low Use" cluster

Variable	Cluster 1 (n = 347) OR (95% CI)	Cluster 2 (n = 289) OR (95% CI)	Cluster 3 (n = 452) OR (95% CI)	Cluster 5 (n = 179) OR (95% CI)
Have you had an HIV test in the past 6 months?	4.01 (2.76, 5.84)	5.42 (3.46, 8.48)	—	3.98 (2.49, 6.34)
Native American versus White	—	6.41 (1.49, 27.58)	—	—
HIV positive	3.44 (1.78, 6.65)	25.94 (12.92, 52.10)	—	5.61 (2.49, 6.34)
Living in halfway house, treatment center	—	2.87 (1.02, 8.05)	—	2.86 (1.01, 8.12)
Hispanic versus White	2.25 (1.38, 3.66)	2.55 (1.40, 4.65)	2.15 (1.37, 3.36)	3.50 (1.84, 6.67)
Black versus White	2.16 (1.26, 3.70)	2.20 (1.18, 4.11)	2.25 (1.37, 3.70)	2.75 (1.40, 5.42)
Asian versus White	—	—	—	3.24 (1.09, 9.63)
CARE versus health education risk reduction	—	—	—	3.32 (1.06, 10.36)
Has your partner ever slapped or hit you?	1.95 (1.27, 2.99)	2.41 (1.49, 3.90)	—	2.22 (1.33, 3.71)
What is the highest grade in school you completed?	—	0.75 (0.65, 0.86)	0.85 (0.76, 0.95)	0.77 (0.66, 0.89)
Gay versus non-gay	—	—	—	0.61 (0.38, 0.99)
Did anyone ever sexually touch you when you did not want to be touched?	—	—	0.59 (0.40, 0.86)	—
Living in house or apartment	—	0.35 (0.15, 0.82)	—	0.30 (0.13, 0.72)
HIV counseling and testing versus health education risk reduction	0.30 (0.20, 0.46)	0.13 (0.08, 0.22)	0.42 (0.29, 0.62)	0.31 (0.18, 0.52)
Outreach versus group	—	0.16 (0.03, 0.84)	0.11 (0.02, 0.47)	0.02 (0.00, 0.26)
Individual versus group	0.19 (0.042, 0.86)	—	0.15 (0.03, 0.65)	—

Note Only odds ratios significant at .05 level shown. Odds ratio greater than one are more descriptive of listed cluster. Odds ratios less than one are more descriptive of reference cluster

have had a recent HIV test, and to have been slapped or hit by a partner. This is the only cluster more likely to be Asian as compared to White. They are more likely to be Hispanic or Black as compared to White. They have less education and are less likely to be White. Housing status distinguishes this cluster from the others. This cluster was more likely to have been surveyed by providers receiving CARE funding.

Discussion

This analysis clustered service usage of both services provided by the agency doing the interviewing and provided by other agencies. The analysis also examined how the clusters could be described demographically, and behaviorally. Those who use more services are more likely to be HIV positive, to have had a recent HIV test, and to have been the victim of physical partner abuse. They are more likely to be Hispanic or Black and less likely to be White, and more likely to have lower educational levels. The major services used are HIV education, HIV counseling and testing, and medical services. Different characteristics are associated with different patterns of service utilization.

A consistent characteristic that was present in three of the four comparisons was the proportion reporting having a recent HIV test. The fact that a recent HIV test showed up

to this extent is noteworthy. Use of other prevention services has been found by other researchers to vary significantly between those who have been tested and those who have not (Kellerman et al. 2006). HIV prevention/education services, in particular HIV testing, appear to bring people into other services.

Hispanic and Black respondents were consistently overrepresented compared to the low use cluster. Prevention services have been reported to be lower among Whites compared to both Black and Hispanics (Steward et al. 2008). Housing stability has been shown to be especially important for non-Whites (Lo et al. 2002). Housing status has been shown to be associated with use of services among those who are HIV positive, with those who are unstably housed more likely to experience adverse outcomes (Smith et al. 2000).

One behavior that was not expected to be a major discriminator between clusters 2, 3, 5 and cluster 4 was the item on being slapped or hit. This showed up in the same three comparisons with the reference cluster that also showed increased proportions of those who are HIV positive. HIV status has been found to significantly influence the decision to remain in the relationship with the batterer (Merrill and Wolfe 2000). Male gay/bisexual violence victims had more emergency room visits, but had less medical care because of financial reasons (Eisenman et al. 2003). Over 25% of those HIV positive individuals in close

relationships reported the presence of abuse (Galvan et al. 2004). It appears that fear of becoming sick and dying is a major part of the decision to stay in the abusive relationship. Also, those with HIV positive partners did not want to abandon their loved one (Merrill and Wolfe 2000). Some literature reports the opposite tendency in that those who commit interpersonal violence are more likely to have multiple sexual partners and less likely to use condoms consistently (Gibbison 2007). The CRAS did not assess the utilization of the available anti-violence/domestic violence services available to the target population. Future service utilization research should examine the availability and use of these services to HIV infected and affected populations.

A major peak on service utilization for cluster 5, the Most Here cluster, is case management. It was also a peak for cluster 2, Most Other Elsewhere. London et al. (1998) explored the extent to which case management services mediated accessing other types of services. Drawing from a sample of caregivers (rather than care receivers), they conceptualized case management as a "meta-service" that can be used by caregivers to mediate between the informal services provided by the caregiver and the formal services (i.e., physician services) that compliment informal care. In this study, use of services, including case management services, was associated with couples comprised of gay men who were both HIV positive, had public insurance, and of poor health. For case management specifically, it was found that older-aged persons were less likely to access case management, and persons who were being cared for by someone who was not a relative, and those with fewer financial resources were more likely to access case management services. Having a case manager in place at baseline, and initiating case management services during the course of the study, were both associated with greater use of services.

Those in clusters 2 and 5 are more likely to live in a residential drug abuse treatment program. Participation in substance abuse treatment has previously been associated with greater use of services (Knowlton et al. 2001). Service access has been especially difficult for HIV-positive injection-drug users. Due to multiple problems found in this population (infectious disease other than HIV, homelessness, psychiatric disorders), research has found that linking traditional HIV/AIDS services to drug treatment (Knowlton et al. 2001) or to needle exchange programs (Pollack et al. 2002) can facilitate entry into other services that can help mitigate both physical and other problems.

Limitations

One limitation is that there was no question about services received outside L.A. County. It is possible that clients may have gone to neighboring counties such as Orange, Riverside, Kern, or Ventura counties to receive services. One limitation that has not had the prominence that it deserves is the use of domestic violence services. Domestic violence and history of sexual abuse showed up as possibly important factors in several comparisons.

Concluding Recommendations

1. Establish Memoranda of Understanding (MOUs) and provide funding for domestic violence services for same-sex couples. Continue to ask about physical and sexual abuse in more detail in future surveys. Perform analysis of existing data to gain insight into this issue.
2. Future surveys should ask about services received outside L.A. County. There are neighboring counties where respondents may have received services. This information would be valuable to have from a planning perspective. OAPP would benefit from a comprehensive dependable database of what services are being offered in which Service Planning Areas by which providers. Future surveys should also ask about the use and need for language translation services.
3. Develop a better understanding of services for Native Americans including the synergism between social support groups and HIV counseling and testing.
4. Case management appears to be an important service and should not be neglected in future funding decisions.
5. Given that Black respondents were overrepresented in most of the comparisons, mobile testing services and intervention programs should be offered in neighborhoods where they reside (Wilkinson 2008).

In conclusion, the CRAS provides essential information about the use of HIV prevention services in Los Angeles County. The County should continue this important effort in conjunction with its prevention planning functions so that improved quality of HIV prevention services continue to be delivered.

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