

# Health Services Utilization Among South African Women Living with HIV and Reporting Sexual and Substance-Use Risk Behaviors

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## Abstract

HIV health services are critical in sub-Saharan Africa where the burden of the HIV pandemic is devastating. Existing studies suggest that HIV-infected individuals from marginalized populations who know their status do not seek health services because they are unaware of available treatment and care options, may not understand how to access services, or have poor access to and utilization of health care services. This study examined factors associated with health service utilization in a sample of poor, underserved recently diagnosed HIV-positive South African women with sexual and substance use risk behaviors. The data were collected between June 2004 and May 2008. Primary outcomes included consultation with a medical professional and utilization of any health services since learning of HIV status at 3- and 6-month follow-up assessments. The study findings suggest that denial of HIV status may be a barrier to care, leading study participants to avoid utilizing health services specific to their disease and to prefer more general medical care services. In multivariate analyses, prior use of health services, financially supporting others, and sex trading were strongly associated with health service use at follow-up assessments. The study findings suggest a reduced likelihood of health services utilization among participants who met *DSM-IV* criteria for drug abuse as well as participants with greater numbers of poor physical health symptoms. As an important preliminary step in examining the issue of health services utilization in sub-Saharan Africa, the findings suggest an urgent need to promote HIV prevention and early testing, to strengthen long-term HIV care services, and to increase access to services.

## Introduction

WOMEN IN SUB-SAHARAN AFRICA are among the most affected by HIV/AIDS, representing 61% of infections among adults in this region.<sup>1</sup> Furthermore, it is estimated that 75% of all women living with HIV are in sub-Saharan Africa.<sup>2</sup> With approximately 1 in 3 people infected with HIV, southern Africa continues to be the global epicenter of the epidemic<sup>2</sup> and accounts for more than one third of HIV infections worldwide.<sup>3</sup> It is estimated that 52% of all women aged 15 or older living with HIV are in southern Africa.<sup>2</sup>

Women who belong to marginalized and underserved groups—such as poor women with low levels of education, substance abusers and/or those who engage in sex work to support themselves and their families—generally face greater limitations in access to appropriate health care services.<sup>4</sup> HIV-infected women from these groups likely have different needs

not only from their male counterparts but also from women in less vulnerable populations. These needs, which if unmet may act as barriers to health care utilization, include financial assistance, housing, transportation, food and substance abuse treatment.<sup>5,6</sup> Unfortunately, efforts to expand access to HIV treatment and care in many African countries have failed to address the needs of populations that are especially vulnerable to the disease and often most in need of treatment and care services.<sup>2</sup>

Reaching vulnerable women of childbearing age who are living with HIV is critical to their lifespan. Linking these women to antiretroviral treatment (ART) and care is essential to achieving positive personal health outcomes.<sup>7,8</sup> It is also critical to secondary HIV prevention strategies that can have the added benefit of preventing further spread of the disease by promoting safer sex behavior and harm-reduction strategies.<sup>9,10</sup> While advances in combination ART as well as care

and treatment of opportunistic infections (OIs) have resulted in dramatic reductions in HIV-associated morbidity and mortality, the expansion of capacity to effectively provide long-term HIV treatment and care to large numbers of people in sub-Saharan Africa is urgently needed.<sup>11</sup> However, to benefit optimally from treatment and care of HIV and OIs, infected individuals must know their HIV status, access care early in the course of the disease, and remain engaged in treatment.<sup>12–14</sup>

Several studies have emphasized the importance of engaging and retaining newly HIV-diagnosed individuals in treatment and care.<sup>11–13,15,16</sup> Barriers and delays in seeking treatment and care become more important as more HIV-infected individuals are identified through increased testing programs, including rapid testing. This is particularly pertinent in many sub-Saharan African countries where more people live with HIV than anywhere else in the world. However, even if HIV infection is diagnosed relatively early—with testing occurring in a variety of innovative settings, such as community-based settings, individuals' homes in rural areas, and mobile testing units—many people who receive positive test results either do not initiate treatment or are lost to treatment and medical care until much later when the disease has seriously advanced. Data from sub-Saharan Africa indicate that early mortality rates occurring within the first year of treatment among adults receiving ART are high, ranging between 8% and 26%.<sup>11</sup> Therefore, strategies to reduce mortality need to focus on delivery of care within ART programs as well as promote early HIV diagnosis and improved pre-ART HIV care through improved access to HIV/AIDS health care services.<sup>11,17</sup>

Although HIV health services are especially critical in sub-Saharan African countries where the burden of the HIV pandemic is devastating, a search of the published literature found few studies using rigorous research methods to evaluate access to HIV/AIDS health services and identify factors associated with health services utilization among HIV-infected individuals in sub-Saharan Africa, and in South Africa in particular.<sup>17</sup> Existing studies suggest that in many instances, HIV-infected individuals from marginalized and underserved populations who know their status do not seek health services because they are unaware of available treatment and care options, may not understand how to access services, or have poor access to and utilization of health care services.<sup>6,18–20</sup> Additionally, these individuals often face structural, financial, and personal and cultural barriers to health care.<sup>17</sup>

This study aimed to address this gap in the literature by identifying factors associated with health service utilization in a sample of poor, underserved South African women with sexual and substance use risk behaviors and recent HIV-positive test results. The study used a conceptual model based on the framework of Aday and Andersen<sup>21,22</sup> that suggests that population characteristics that influence health service utilization fall into three main categories: predisposition to use care; factors that enable or hinder use; and extent of need for care. A better understanding of factors that facilitate or hinder health services utilization can be used to design effective interventions and inform policies to increase utilization, particularly among HIV-infected individuals from vulnerable and underserved populations.<sup>23</sup>

## Methods

### Study participants

The study data were drawn from a community-based randomized trial of an HIV prevention intervention for women in Pretoria, South Africa, with high sexual and substance use risk behaviors. This intervention was developed for substance-abusing African American women in the United States<sup>24,25</sup> and adapted for Black African women in Pretoria.<sup>26,27</sup> The adaptation process, recruitment techniques, eligibility criteria, and study protocol have been described in detail elsewhere.<sup>28,29</sup> Briefly, participants for this study were recruited through targeted street outreach in neighborhoods and townships in or within close proximity to Pretoria. Eligible participants were female and 18 years of age or older, reported either trading sex for money or drugs or having had unprotected sex, reported use of alcohol on at least 13 of the past 90 days, provided written consent to participate, and provided verifiable locator information for Gauteng Province. Participants completed a two-part baseline interview administered by trained staff using the paper-and-pencil interview format. Participants were randomized to one of two HIV prevention interventions and also assessed at 3- and 6-month follow-up interviews. Participant enrollment and baseline interviews began in June 2004 and 6-month follow-up interviews were completed in May 2008.

HIV antibody testing as well as pretest and posttest counseling were offered to all participants as part of their first intervention session. All HIV testing was conducted at the study field office in Pretoria. Only participants who consented were tested for HIV. Testing was performed with OraQuick<sup>®</sup> Rapid HIV-1 Antibody Test (OraSure Technologies, Bethlehem, PA); reactive samples were confirmed with Pareekshak<sup>®</sup> HIV Triline (a rapid test to detect HIV 1 and 2 antibodies; UCB Pharma, Smyrna, GA). Participants with indeterminate OraQuick<sup>®</sup> or Pareekshak<sup>®</sup> test results were encouraged to seek testing services at a clinic or voluntary testing and counseling site.

Study interventionists actively referred all participants with positive HIV test results to appropriate health care services. Active referrals were made by helping participants schedule appointments for needed health services. Interventionists referred to a Community Resource Guide for appropriate HIV agencies and health clinics where women could receive prompt medical attention. Approximately 2 to 4 weeks after positive HIV status was determined and referrals to health services were provided, study interventionists attempted to have one additional interaction with a participant via a telephone call or in-person during outreach activities to further encourage contact with an HIV clinic. Among the 583 participants who completed the two-part baseline interview and were randomized, 62% (362/583) agreed to take the HIV test offered by the study at their first intervention session and 56% (203/362) of participants who were tested had positive HIV test results. The final dataset for this study included a total of 203 HIV-infected participants.

### Measures

Outcome variables included two measures of health services utilization assessed at the 3- and 6-month follow-up interviews by self-report: (1) consultation with a medical

professional, such as a specialist, general doctor and/or nurse (In the past 90 days, did you consult with any of the following people because you were sick or receiving a routine exam?); and (2) utilization of any health services (Have you received any health services since you've been told you are HIV positive?). Because measures specific to HIV health care services<sup>4,5</sup> were not available in this study, these outcomes were selected as they provide some indication of whether participants are receiving other medical care, which may or may not include HIV care. Participants with at least one outcome observation at either the 3- or 6-month follow-up were included in the analyses.

Health status was measured using a 12-item index of sexually transmitted disease (STD) symptoms in the past 90 days (e.g., In the past 90 days have you experienced any burning or pain when passing urine?), an 11-item index of physical health concerns in the past 90 days (e.g., During the past 90 days, have you had any of the following health problems/concerns: had chronic diarrhea?), and a single-item question assessing overall health (In general, how would you say your health is currently? Excellent, very good, good, fair, poor).

Alcohol and other drug use abuse were assessed with the following four substance abuse criteria, as defined by the *DSM-IV*<sup>30</sup>: (1) recurrent substance use resulting in failure to fulfill major role obligations, (2) recurrent substance use in physically hazardous situations, (3) recurrent substance-use-related legal problems, and (4) continued substance use despite persistent or recurrent social or interpersonal problems. Past-year abuse was defined as meeting one or more of these criteria in the previous year.

The following seven substance dependence criteria, as defined by the *DSM-IV*, were also assessed: (1) tolerance, (2) withdrawal, (3) using the substance in larger amounts or over a longer period than intended, (4) persistent desire or unsuccessful attempts to cut down or stop substance use, (5) spending a great deal of time obtaining or using the substance or recovering from its effects, (6) reducing or giving up important social, occupational or recreational activities because of substance use, and (7) continued substance use despite knowledge of a physical or psychological problem. Past-year alcohol and drug dependence was restricted to individuals who met at least three dependence criteria in the year preceding the interview. The psychometric properties of these measures are available elsewhere.<sup>31</sup> Sociodemographic data collected at baseline included age, education, income, marital status, ever given birth, engaged in sex trading in the past 90 days, and financially supporting others.

### Analysis

All statistical analyses were performed using the SAS 9.1 statistical software package (SAS Institute Inc., Cary, NC). The study sample was first summarized on baseline measures of sociodemographic, health status, and substance abuse characteristics. Independent variables were identified based on the Aday and Andersen<sup>21,22</sup> framework of health services utilization, evidence provided in the detailed review of previous studies, and available measures and proxies. Because of sample size limitations, final models were based on bivariate analyses that compared identified independent variables on the outcome variables (data not shown). Multiple logistic regression analyses were performed to determine factors asso-

ciated with health services utilization at 3- and 6-month follow-ups after ascertaining HIV-positive status. The outcome variables measured at 3- and 6-month follow-ups were consultation with a medical professional, such as a specialist, general doctor, and/or nurse, in the past 90 days and utilization of any health services since learning of HIV-positive status. The predictor variables included measures of previous health services utilization, sex trading, financially supporting others, income, health status, and alcohol and other drug abuse. Separate regression models were developed for each outcome and for each follow-up period.

### Results

The sociodemographic, health, and substance abuse characteristics of the sample of HIV-infected participants at baseline are presented in Table 1. The mean age of the participants was 29 years, with approximately 82% under age 35. Slightly over 25% of the participants had a primary education or less; about 30% were single, and about 82% had traded sex in the past 90 days. About three quarters of the participants had given birth, a little under three quarters were financially supporting others, and slightly less than half had a monthly income under ZAR 450/- (~USD 75/-).

Approximately two thirds of the participants reported their health status as good, fair, or poor. The mean number of STD symptoms in the past 90 days was approximately four, with about 62% of participants reporting three or more symptoms. Results were similar for the mean number of physical health concerns. At baseline, 77% and 62% of participants met *DSM-IV* criteria for past-year alcohol abuse and past-year alcohol dependence, respectively. Among participants, 31% and 27% met *DSM-IV* criteria for past-year drug abuse and past-year drug dependence, respectively.

Among the 203 participants with positive HIV test results, 177 (87%) and 185 (91%) returned for their 3- and 6-month follow-up assessments, respectively (Table 2). Among these individuals, approximately 73% (130/177) at 3-month follow-up and about 69% (128/185) at 6-month follow-up responded that they had been told they were infected with HIV, suggesting that a significant proportion of participants may have been in denial about their HIV status. Among individuals who returned for their follow-up assessments, 31% (55/177) at 3-month follow-up and 40% (74/185) at 6-month follow-up reported having received health services since ascertaining their HIV-positive status. A larger proportion of participants—46% (81/177) at 3-month follow-up and 57% (105/185) at 6-month follow-up—reported having consulted with a medical professional.

In multivariate logistic regression (Table 3), consultation with a medical professional at baseline was significantly associated with receipt of health services since being told of HIV positive status at 3-month follow-up (adjusted odds ratio [AOR] = 2.62; 95% confidence interval [CI] = 1.20, 5.73) and consultation with a medical professional at 3-month follow-up (AOR = 2.19; 95% CI = 1.14, 4.19). In addition, financially supporting others at baseline was significantly associated with receipt of health services at 3-month follow-up (AOR = 2.66; 95% CI = 1.09, 6.52) and sex trading was significantly associated with consultation with a medical professional at 3-month follow-up (AOR = 3.42; 95% CI = 1.39, 8.39).

TABLE 1. BASELINE CHARACTERISTICS OF HIV-INFECTED STUDY PARTICIPANTS ( $n = 203$ )

Characteristic	Statistic/n (%)
Sociodemographic characteristic	
Mean age (SD)	28.9 (7.1)
Age group	
18–24	72 (33%)
25–34	106 (48%)
35+	41 (19%)
Education	
None/primary	52 (26%)
Secondary and higher	151 (74%)
Traded sex in past 90 days	
Yes	166 (82%)
No	37 (18%)
Income <sup>a</sup>	
<ZAR 450	99 (49%)
≥ZAR 450	104 (51%)
Marital status	
Single	60 (30%)
Involved not living with partner	85 (42%)
Living with partner or married	55 (27%)
Separated or divorced	3 (1%)
Ever given birth	
Yes	152 (75%)
No	51 (25%)
Financially supporting others	
Yes	147 (72%)
No	55 (27%)
Health Status	
Perceived health status	
Excellent/very good	67 (33%)
Good/fair/poor	136 (67%)
Mean number of STD symptoms past 90 days (SD)	3.9 (3.0)
Mean number of physical health concerns past 90 days (SD)	3.8 (2.7)
Substance abuse ( <i>DSM-IV</i> criteria)	
Past-year alcohol abuse	
Yes	156 (77%)
Past-year drug abuse	
Yes	62 (31%)
Past-year alcohol dependence	
Yes	125 (62%)
Past-year drug dependence	
Yes	55 (27%)

<sup>a</sup>Using an exchange rate of USD 1/-:ZAR 6/-. SD, standard deviation; STD, sexually transmitted disease.

Receipt of health services since learning of HIV-positive status at 3-month follow-up (AOR = 19.98; 95% CI = 5.22, 76.47) and consultation with a medical professional at 3-month follow-up (AOR = 5.51; 95% CI = 2.22, 13.64) were significant and strong predictors of receipt of health services at 6-month follow-up and consultation with a medical professional at 6-month follow-up, respectively. Additionally, there was a marginally significant negative association between drug abuse, as defined by *DSM-IV* criteria, at 3-month follow-up and receipt of health services since learning of HIV-positive status (AOR = 0.29; 95% CI = 0.07, 1.10) as well as consultation with a medical professional at 6-month follow-up (AOR = 0.32; 95% CI = 0.10, 1.02). There was also a marginally significant association between number of poor

TABLE 2. CHARACTERISTICS OF STUDY PARTICIPANTS WITH KNOWN HIV-POSITIVE STATUS ( $n = 203$ ) ASSOCIATED WITH FOLLOW-UP RATES, ACKNOWLEDGMENT OF HIV STATUS, AND HEALTH SERVICES UTILIZATION

Characteristic	n (%)
Returned for 3MFU	177 (87%)
Returned for 6MFU	185 (91%)
Ever been told that you were infected with HIV?	
3MFU	
Yes	130 (73%)
No	40 (23%)
Don't know/Refused	7 (4%)
6MFU	
Yes	128 (69%)
No	49 (26%)
Don't know/refused	8 (4%)
Received any health services since you've been told you are HIV positive?	
3MFU	
Yes	55 (31%)
No	67 (38%)
Missing	55 (31%)
6MFU	
Yes	74 (40%)
No	47 (25%)
Missing/don't know/refused	64 (35%)
In the past 90 days, did you consult with a medical professional	
3MFU	
Yes	81 (46%)
No	96 (54%)
6MFU	
Yes	105 (57%)
No	80 (43%)

3MFU, 3-month follow-up; 6MFU, 6-month follow-up.

physical health symptoms at 3-month follow-up (AOR = 0.78; 95% CI = 0.60, 1.01) and consultation with a medical professional at 6-month follow-up.

Analyses for the health service utilization at 3- and 6-month follow-up dependent variables included only participants who responded that they had been told that they were HIV-infected. For the consultation with a medical professional at 3- and 6-month follow-up dependent variables, results shown in Table 3 included all HIV-infected participants in the analyses. When only those who responded that they knew they were HIV-infected were included in the analyses results were substantially different with no statistically significant associations between consultation with a medical professional at 3-month follow-up and the independent variables included in the model. Results for consultation with a medical professional at 6-month follow-up remained the same except for number of poor physical health symptoms at 3-month follow-up, which was no longer significantly associated with the dependent variable.

## Discussion

South Africa has made great progress in increasing access to HIV treatment and care, and today has the largest number

TABLE 3. LOGISTIC REGRESSION MODELS: PREDICTORS OF HEALTH SERVICE UTILIZATION AND CONSULTATION WITH A MEDICAL PROFESSIONAL AT THREE-MONTH AND SIX-MONTH FOLLOW-UP ASSESSMENTS

Dependent variable	Independent variable	AOR	95% CI
Health service utilization at 3MFU ( <i>n</i> = 121)	Sex trading (BL)	0.50	0.17–1.46
	Consultation with a medical professional (BL) <sup>a</sup>	2.70	1.22–5.98
	Number of poor physical health symptoms (BL)	0.95	0.82–1.09
	Alcohol abuse past 12 months (BL)	0.55	0.20–1.47
	Drug abuse past 12 months (BL)	1.24	0.48–3.20
Health service utilization at 6MFU ( <i>n</i> = 91)	Financially supporting others (BL) <sup>a</sup>	2.66	1.09–6.52
	Health service utilization (3MFU) <sup>b</sup>	19.98	5.22–76.47
	Number of poor physical health symptoms (3MFU)	1.14	0.91–1.42
	Alcohol abuse past 12 months (3MFU)	0.42	0.13–1.37
	Drug abuse past 12 months (3MFU) <sup>c</sup>	0.29	0.07–1.10
Consultation with a medical professional at 3MFU ( <i>n</i> = 170)	Income (BL)	0.43	0.14–1.31
	Sex trading (BL) <sup>b</sup>	3.42	1.39–8.39
	Consultation with a medical professional (BL) <sup>a</sup>	2.19	1.14–4.19
	Number of poor physical health symptoms (BL)	1.02	0.88–1.19
	Number of STI symptoms (BL)	0.92	0.81–1.05
	Alcohol abuse past 12 months (BL)	1.17	0.53–2.60
	Drug abuse past 12 months (BL)	1.15	0.54–2.45
Consultation with a medical professional at 6MFU ( <i>n</i> = 114)	Financially supporting others (BL) <sup>a</sup>	1.47	0.70–3.09
	Consultation with a medical professional (3MFU) <sup>b</sup>	5.51	2.22–13.64
	Number of poor physical health symptoms (3MFU) <sup>c</sup>	0.78	0.60–1.01
	Number of STI symptoms (3MFU)	1.15	0.91–1.46
	Alcohol abuse past 12 months (3MFU)	0.65	0.26–1.66
	Drug abuse in past 12 months (3MFU) <sup>c</sup>	0.32	0.10–1.02
	Income (BL)	0.81	0.35–1.88

<sup>a</sup>*p* < 0.05.<sup>b</sup>*p* < 0.01.<sup>c</sup>*p* < 0.10.

AOR, adjusted odds ratio; CI, confidence interval; BL, Baseline; 3MFU, 3-month follow-up; 6MFU, 6-month follow-up.

of people enrolled in ART of any country in the world. By 2007, approximately 371,731 were receiving ART; that is, 42% of the 889,000 people estimated to be in need.<sup>32</sup> However, with an estimated 58% of HIV-infected people still in need of ART, there is an urgent need to expand the capacity to effectively deliver ART and care to larger numbers of people, especially those who are marginalized and underserved.

This study aimed to contribute to the limited literature on health services utilization among underserved and marginalized HIV-infected individuals in sub-Saharan Africa, and specifically in South Africa. The sample comprised women recently tested and diagnosed with HIV in Pretoria with low incomes, poor health, and high-risk sexual and substance use behaviors, as indicated by baseline characteristics. Women in the sample were in desperate need of health care services, as evidenced by anecdotal data that 22 participants died during the study period, 15 of whom were HIV positive. It is likely that many of these women had their HIV diagnosis made late in the course of the disease; or even if diagnosed relatively early with infection, they did not utilize HIV health services until the disease was too advanced.<sup>11</sup> The study findings at follow-up assessments demonstrated a critical need to improve access to health services for HIV-infected women who are at risk of poor utilization of health services they urgently need.

Similar to U.S. studies, this study was based on the premise that HIV-infected individuals need appropriate treatment and care, which entails early diagnosis of HIV status, timely

linkage to appropriate health services, and engagement and retention in care.<sup>12–14</sup> Studies in the United States have found that 20–40% of recently diagnosed HIV-infected individuals fail to initiate treatment and care within 3–6 months after receiving their HIV diagnosis.<sup>12, 33</sup> Although the dependent variables for this study (i.e., consultation with a medical professional and health care utilization) are not specific to HIV care, they provide valuable information in a context where very little is known about health services utilization among HIV-infected women. Findings from this study, especially with respect to substance use and access to health services, are similar to previous studies among marginalized populations in the United States.<sup>6,15,20</sup>

The study results at 3- and 6-month follow-up assessments suggest that denial of HIV status may be an important barrier to care that leads study participants to avoid utilizing health services specific to their disease and to prefer more general medical care services. This is supported by the difference in results for consultation with a medical professional at 3-month follow-up when all HIV-infected participants were included in the analyses and when only those who responded that they knew they were HIV-infected were included. These results suggest the need for outreach interventions and case management services to facilitate access to care and promote HIV/AIDS health service utilization among low-income women from underserved and marginalized populations in South Africa. Studies in the United States have shown that outreach interventions can successfully engage and retain

newly diagnosed, marginalized individuals in HIV care.<sup>5,20</sup> Other studies have found that case management programs that link hard-to-reach and marginalized HIV-infected individuals to health care are associated with greater access to and utilization of health care services.<sup>18,19,33</sup> However given that the dependent variables for this study were not HIV specific, additional studies are needed to further examine and confirm the role denial of HIV status plays in HIV-specific health care utilization.<sup>34</sup> Additionally, although further examination of the data revealed no significant demographic differences between those who acknowledged having been told they were HIV-infected and those who did not, other factors not assessed in this study such as health literacy may be important.<sup>34</sup>

Similar to previous studies in the United States, prior use of health services was strongly associated with subsequent health service utilization. Participants who had used medical services in the recent past were significantly more likely to report using health services and consulting with a medical professional at the 3- and 6-month follow-up assessments. This suggests that prior use of health services may act as a facilitator, in that access to medical care has been established and a relationship started with a medical professional or health service facility.<sup>35</sup>

Other factors associated with a higher likelihood of health services utilization in this study are sociodemographic in nature, including financially supporting others and sex trading. In the South African context, it is possible that among marginalized and underserved women, sex workers as well as women who are financially supporting others had greater access and means to obtain health care services. This suggests that these factors may work as both predisposing and enabling variables.<sup>23</sup> This finding, however, warrants further exploration.

Although the relationships were marginally significant, the study findings suggest that there is a reduced likelihood of health services utilization among participants who met *DSM-IV* criteria for drug abuse as well as individuals with greater numbers of poor physical health symptoms. While additional studies are warranted to further examine these findings, they suggest that a great unmet need may exist among individuals who are most in need of health services because of poor access to services or delay in seeking medical care. Some studies have shown that disease progression and survival in patients with HIV infection in sub-Saharan Africa and the United States are a result of inadequate medical care rather than biologic differences in the natural history of HIV infection due, for example, to high-risk behaviors, including drug use.<sup>11,36</sup> Findings from other studies also suggest that substance users may be less attentive to poor health symptoms and may delay or avoid seeking treatment until their disease is advanced.<sup>37,38</sup> For alcohol and other drug users with HIV/AIDS, outreach interventions and case management programs may facilitate navigation through complex and fragmented service delivery systems as well as linkages and referrals to other support services needed to stabilize their lives.<sup>18</sup>

As mentioned previously, the results from studies in sub-Saharan Africa show high early mortality rates within ART programs, ranging between 8% and 26% of patients dying in the first year of ART. Lawn et al.<sup>11</sup> argue for strategies to reduce mortality that focus not only on delivery of care within ART programs but more fundamentally on promoting early HIV diagnosis and improved pre-ART HIV care. Moreover,

they propose that appropriate longitudinal HIV care needs to be strengthened in sub-Saharan Africa and should include screening for and treatment of OIs, reproductive health care, and serial CD4 cell count assessment until eligibility for ART is met.

Several limitations to this study should be noted. A key limitation of the data was the small sample size ( $n = 203$ ), which resulted in the selection of a parsimonious estimation model. One reason for the small sample size was that HIV testing was voluntary and a significant proportion of the study sample (38%) opted not to take the test offered by the study. Given the high prevalence among participants who took the HIV test offered by the study, it is likely that some individuals who opted not to take the test would have had positive test results. Second, selection bias may limit the generalizability of the findings to all HIV-infected women with high-risk substance use and sex risk behaviors in South Africa. It is possible that differences may exist in the ability to seek and use health services between study participants who "self-selected" to take the HIV test offered by the study and received an HIV-positive result vis-à-vis those who did not take the test and may have been HIV-positive. Indeed, findings from an earlier study<sup>28</sup> indicate that at baseline participants who consented to HIV testing were significantly more likely to have secondary education, report past year alcohol abuse, and report lifetime physical abuse. On average, they also reported having significantly more sexually transmitted disease symptoms and physical health concerns in the past 90 days, and more visits to a health clinic in the past 12 months. Additionally, health services utilization patterns could be different among 21% ( $n = 43$ ) of the study sample who knew they were HIV-infected at baseline relative to those who became aware of their status during testing for this study. Third, limitations of self report data may also apply, including errors in recall, which may be affected by substance use and social desirability with respect to health status. Fourth, some measures of factors that may affect care utilization patterns were not available, for example, previous experiences with health care services before HIV diagnosis and stigma related to HIV or accessing HIV care.

This study is an important first step in examining the critical issue of health services utilization among women in sub-Saharan Africa living with HIV who also have dual risk with high levels of substance use and sex risk behaviors. Marginalized and underserved women of childbearing age in sub-Saharan Africa who are vulnerable to HIV infection may be faced with several barriers to care that need to be identified and addressed, including denial of HIV infection, poor access to services, and weak health delivery systems. The study findings suggest that there is an urgent need not only to promote HIV prevention and early testing but also to strengthen long-term HIV care services and increase access to services. In addition, the findings highlight the need for future studies to more rigorously examine the effectiveness of outreach interventions and HIV case management programs in addressing barriers to HIV/AIDS treatment and care by marginalized and underserved populations and thereby improve health outcomes. Such studies would provide governments and nongovernmental agencies with critical evidence-based information to develop and implement programs for HIV-infected populations that engage, link, and retain them in care and ultimately prolong their lifespan.

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### Author Disclosure Statement

No competing financial interests exist.

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