

# HIV Counseling and Testing Practices at an Urban Hospital in Kampala, Uganda

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Published online: Jan. 4, 2006

While the majority of medical inpatients in Uganda are assumed to be HIV-positive, HIV testing is limited in inpatient settings. This study describes HIV testing practices and risk behavior among medical inpatients at an urban hospital in Uganda. We interviewed 395 adults on the day of discharge. Overall, 46% tested for HIV before or during admission. Of the 20% tested during hospitalization, 64% were HIV-positive. Among 47% who had sex in the previous year, only 14% used condoms consistently and only 20% knew the HIV status of their sexual partner, indicating that participants would benefit from risk-reduction counseling. Yet, only 26% of participants tested during hospitalization received post-test counseling. Half of the participants with HIV-related illnesses left the hospital without being offered the test, a missed opportunity for HIV prevention counseling and care. The findings indicate that hospitals are important venues for HIV counseling and testing.

**KEY WORDS:** HIV; voluntary counseling and testing (VCT); Africa; HIV risk behavior; hospital.

## INTRODUCTION

HIV counseling and testing has been prioritized as a key component of prevention and care programs globally. HIV counseling and testing informs individuals of their HIV serostatus, educates individuals on specific risk reduction practices, provides strategies for partner disclosure and testing, helps patients identify and overcome barriers to risk reduc-

tion, and links HIV-infected individuals to available medical care (UNAIDS, 2002). The efficacy of HIV counseling and testing as a HIV risk behavior reduction strategy has been demonstrated in a randomized multi-center trial that included sites in sub-Saharan Africa and the Caribbean (The Voluntary HIV-1 Counseling and Testing Efficacy Study Group, 2000). Several other studies also have shown reductions in HIV risk behavior following counseling and testing (Gresenguet *et al.*, 2002; De Zoysa *et al.*, 1995; Muller *et al.*, 1992; Higgins *et al.*, 1991; Allen *et al.*, 1992).

With the expansion of access to antiretroviral therapy (ART) and opportunistic infection management, the role of counseling and testing as a gateway to effective treatment for HIV infection has grown dramatically. The World Health Organization (WHO) plans to initiate ART for 3 million people by the end of 2005 (WHO, 2002a, b; UNAIDS/WHO, 2003; Global HIV Prevention Group, 2004). In Uganda, where an estimated 1.1 million people are living with HIV/AIDS, the Ministry of Health plans to provide ART for at least 100,000

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individuals by the year 2007 (Ministry of Health, 2003a, b).

Although expanding, access to counseling and testing services remains limited in Uganda. As in most countries till date, investment in HIV counseling and testing has focused on voluntary counseling and testing (VCT) infrastructure, including the development of services at freestanding VCT centers, antenatal care clinics, and sexually transmitted disease clinics. In this context, according to the Uganda Demographic Health Survey (UDHS) 2000–2001, only 8% of female and 12% of male respondents knew their HIV status (UDHS, 2001; Ministry of Health, 2003a, b). However, the majority of respondents expressed a desire to test for HIV (72% of women and 74% of men). Demand is likely to increase with improved access to HIV/AIDS care, particularly ART.

Recently, there has been increasing interest in the expansion of HIV counseling and testing services into the inpatient setting both from HIV treatment and prevention perspectives: counseling and testing may be an efficient method to identify HIV-infected individuals with advanced disease who are in need of HIV antiretroviral therapy (De Cock, Mbori-Ngacha, and Marum, 2002; De Cock, Marum, and Mbori-Ngacha, 2003; Global HIV Prevention Group, 2004). The inpatient setting may also represent an opportunity to avert future HIV infections through the provision of effective HIV risk reduction counseling to both seropositive and seronegative individuals. However, if acutely ill hospitalized persons are no longer engaging in risk behavior due to illness, hospital-based HIV counseling and testing will have little impact on preventing HIV transmission.

This study was designed to describe the HIV counseling and testing practices in medical wards at an urban teaching hospital in Kampala, to establish the extent to which members of the inpatient population have participated in counseling and testing either before or during hospital admission, and to characterize the HIV risk behavior patterns among hospitalized patients. Mulago Hospital is the largest public hospital in Uganda. It also is the primary teaching institution for Makerere University Medical School, and it is one of the two national referral hospitals in Uganda. Five general medical wards (three non-private, one private, and one emergency ward) provide inpatient services. Approximately 1200 patients are admitted to the medical service each month.

## METHODS

### Participants

This was a cross-sectional study of a consecutive sample of 395 adults recruited on the day of discharge from Mulago Hospital general medical wards. Patients were recruited on the day of discharge in order to collect information on HIV counseling and testing practices during the current hospitalization.

### Measures and Data Collection Procedures

Structured face-to-face interviews were conducted in Luganda and English, according to participant preference. Socio-demographic variables included: age, sex, marital status, income, education level, and interaction with people known to be HIV-positive. Monthly income included all sources of money from employment, friends, and family, and it was categorized as 0–50,000 shillings vs. >50,000 shillings (US\$25). Education was defined as any formal education vs. none.

HIV risk behavior variables included: sexual contact in the previous 12 months, number of sexual partners in the previous 12 months (none, one, two, and more than two partners), condom use (not at all, sometimes and always, and condom use at last sex). HIV status of the most recent sexual partner was defined as known negative, known positive or unknown. Illness and admission in the previous 12 months was categorized as yes/no. For condom use, patients reporting less than 100% condom use were compared with everyone who reported always using a condom or having no sex partners in the previous 12 months.

Diagnoses made by the medical team were categorized as HIV-related (clinically suspected AIDS, Kaposi's sarcoma, candidiasis and cryptococcal meningitis), potentially HIV-related (tuberculosis, pneumonias, and gastroenteritis), malaria, and others. Length of hospitalization was log transformed due to the wide range in the length of hospital stays. Additional inpatient HIV testing data, length of hospital stay, and diagnosis were abstracted from medical charts. Key informant interviews were conducted with physicians regarding HIV testing practices. Data collection took place during June and July 2003.

## Data Analyses

Factors associated with receiving an HIV test before and/or during hospitalization at Mulago Hospital were determined using multiple logistic regression. All variables used in bivariate analyses were included in initial multivariate logistic regression models. Backward elimination of variables were used to produce final models containing predictors that are statistically significant at the  $\alpha = .05$  level. For modeling, marital status was defined as married vs. any other marital status.

## RESULTS

A total of 455 individuals were approached. Of these, 60 did not participate in the study. Among the 60 excluded individuals, thirty-five were not eligible to participate based on the following predefined exclusion criteria: 26 were too ill to provide informed consent or to participate in the study, seven were below 18 years of age, and two could not speak English or Luganda. Ten eligible persons declined to participate in the study and 15 patients who initially agreed to participate were discharged from the ward before a structured interview could be conducted.

The mean age of the study population was 38 years. Most participants (60%) were female. The majority of respondents (64%) were employed, though 59% of these had a monthly income of less than 50,000 Uganda shillings. The majority of participants (73%) knew a person suspected to be infected with HIV, but very few (28%) reported that he/she knew a person who had tested positive for HIV. Most respondents (79%) had received some formal education and 50% were married (See Table I).

### HIV Sexual Risk Behavior

Nearly all study participants (95%) had ever had sexual intercourse. Of these, 47% (178) reported sexual activity within the previous year. Twenty-four percent (43) had more than one sexual partner in the previous one year. Only 21% (38) reported use of a condom during his/her most recent sexual encounter and 14% (24) reported condom use every time he/she had sex during the previous year. Only 20% (36) knew the HIV status of his/her last sexual

**Table I.** Socio-Demographic Characteristics

Characteristic	Number (N = 395)	Percentage
Sex		
Female	233	59.9
Male	162	41.0
Age group		
18–20	24	6.1
21–30	155	39.2
31–40	84	21.3
41–50	57	14.4
>50	75	19.0
Religion		
Catholic	114	28.9
Protestant	149	37.7
Moslem	67	16.9
Pentecostal	50	12.7
Other	15	3.8
Marital status		
Married	199	50.4
Separated/divorced	81	20.5
Never married	72	18.2
Widowed	43	10.9
Education level		
No formal education	80	20.2
P1–P7	161	40.8
Lower secondary	103	26.1
Other	51	12.9
Monthly income		
<15,000	122	30.9
15000–50,000	109	27.6
>50,000–120,000	81	20.5
>120,000	83	21.0

*Note.* Socio-demographic characteristics of medical inpatients in Mulago hospital, Uganda, July 2003.

partner; eight of these reported known HIV-positive partners.

### HIV Counseling and Testing Before and During Hospitalization

Thirty-three percent ( $N = 131$ ) of subjects reported HIV testing prior to hospitalization. Among the participants who reported a history of prior HIV testing, nearly all (95%) said they had received test results. Sixty-four percent reported receipt of pre- and post-test counseling. Although most (71%) reported sharing results with someone, disclosure to sexual partners was much less common. Only 40% reported sharing serostatus information with their partner(s).

Among participants who had not tested for HIV prior to admission, the most common reasons

for not testing included: never thought of testing (59 respondents; 22%), lack of perceived HIV risk (33 respondents; 13%), lack of money/test was expensive (25 respondents; 10%), no previous illness (22 respondents; 9%), had been faithful/not sexually active (17 respondents; 7%). Other reasons included fear of consequences related to a positive result, lack of an opportunity to test, and thinking he/she was too old and therefore had no reason to worry.

Seventy-seven (20%) study subjects reported that they had been HIV tested during hospitalization; this included 28 repeat- and 49 first-time testers. Overall, 180 patients (46% of total sample) tested for HIV either before or during admission.

In contrast to the relatively high proportion of respondents reporting counseling in the ambulatory setting, only 29 and 26% of subjects who tested during hospitalization reported receipt of pre- and post-test counseling respectively. Key informant interviews with physicians on the medical wards identified the following reasons for lack of counseling during hospitalization: lack of counselors on the wards, lack of physician training to provide HIV pre- and post-test counseling, and lack of time required for counseling due to the heavy work load.

### Acceptability of Inpatient Testing

Only 28% ( $N=110$ ) of the patients reported that they were asked to test for HIV during hospitalization; seventy-seven (70%) of these agreed to test. Most (64%) of the participants who denied testing before and during hospitalization said they would participate in counseling and testing in the hospital if asked. The most common reasons for not testing during hospitalization included lack of money (42%) and not being aware that testing was available (27%). Others said they would prefer to test after discharge (13%). Few individuals (4%) reported not testing due to fear of learning their HIV status. Only five patients reported that they requested the test and were tested during hospitalization.

### Prevalence of HIV Infection in the Study Sample

Sixty-three (50%) participants who were tested prior to admission reported positive HIV test results. Among the 77 patients who were tested during hospitalization, 52 (68%) received results and 64% of

these were HIV-positive. Medical chart review indicated that 20% of the patients carried one or more HIV-related diagnosis (clinically suspected AIDS, candidiasis, cryptococcal meningitis, or Kaposi's sarcoma) and 33% had potentially HIV-related diagnoses (tuberculosis, pneumonia, gastroenteritis). Thirteen percent were diagnosed with malaria; 34% had other diagnoses.

### Predictors of HIV Testing Before and During Hospitalization

Bivariate predictors for use of HIV testing services prior to hospitalization included formal education, higher income, previous illness, previous admission, knowing partner's HIV status, and knowing a person with HIV. Significant independent predictors in multivariate analysis included: higher income, formal education, previous illness, knowing partner's HIV status, and knowing someone with HIV (Table II).

Physicians offered testing to 110 individuals (28%). Of the 110 individuals offered testing, 77 (70%) agreed to test. Bivariate predictors for being offered an HIV test included younger age, formal education, and having an HIV-related diagnosis. Male gender and HIV-related diagnosis were associated with being asked to test by physicians in a multivariate model (Table III). Among participants with HIV-related illnesses, 51% were offered HIV testing. Few people among those diagnosed with potentially HIV-related illnesses (34%), and even fewer among those with a diagnosis of malaria (29%) and other diagnoses (28%), were tested for HIV (See Table III).

## DISCUSSION

We found that less than half the medical inpatients surviving to discharge in an urban public hospital in a resource-limited setting had participated in HIV testing prior to or during hospitalization. Although it is suspected that the majority of medical inpatients in high-prevalence countries such as Uganda are infected with HIV (Lie, Biswalo, and Klepp, 1995; Tembo *et al.*, 1994 Fabiani *et al.*), we found that those without overt signs and symptoms of AIDS were much less likely to be offered HIV testing than those presenting with overt complications of HIV infection. Overall, half of the inpatients with HIV-related illnesses and two-thirds of

**Table II.** Predictors of HIV Testing Before Hospitalization

Variable		Bivariate predictors (N = 395)		Multivariate predictors (N = 395)	
		Unadjusted odds ratio	95% CI	Adjusted odds ratio	95% CI
Formal education	(Any)	3.15	1.67–5.95*	2.69	1.35–5.36*
Age	+10 years	0.89	0.77–1.02		
Sex	Male	0.97	0.63–1.48		
Income	(>50,000 shillings)	2.22	1.45–3.42*	1.73	1.08–2.79*
Marital status	Married	1.20	0.79–1.83		
Previous illness (in 12 months)	Yes	1.99	1.25–3.17*	2.15	1.30–3.55*
Previous admission (in 12 months)	Yes	1.89	1.23–2.89*		
Knowing a person with HIV	Yes	1.91	1.21–3.00*	1.90	1.09–3.33*
More than one sexual partner	Yes	0.87	0.41–1.83		
Condom use (12 months)	<100%	0.93	0.61–1.44		
Know HIV status of partner	Yes	6.29	2.93–13.5*	5.75	2.55–12.95*

Note. Predictors of HIV testing before hospitalization, among medical inpatients in Mulago hospital, Uganda, July 2003.

\*Statistically significant variables ( $p < 0.05$ ).

those with potentially HIV-related illnesses left the hospital without being offered an HIV test. This represents a missed opportunity to identify and refer for care many seropositive individuals.

Existing literature suggests that targeting candidates for inpatient HIV testing on clinical grounds is tremendously insensitive: Kwesigabo *et al.* (1999) found that only 11.3% of the HIV seropositive patients identified through anonymous testing would have been HIV-tested based on clinical suspicion of AIDS. Of particular note, the majority of inpatients diagnosed with malaria in our study were

not offered HIV testing during hospitalization, despite recent research demonstrating an association between HIV and severe malaria (Whitworth *et al.*, 2000; Kashamuka *et al.*, 2003; Corbett *et al.*, 2002). In another study from northern Uganda, 52% of patients diagnosed with malaria tested positive for HIV (Fabiani *et al.*, 2003).

Utilization of HIV counseling and testing services prior to hospitalization was associated with income, prior illness, knowing a person with HIV and knowing the primary sexual partner’s HIV status. The average cost of an HIV test in Kampala is about

**Table III.** Predictors of Being Asked to Test for HIV During Hospitalization

Variable		Bivariate predictors (N = 392)		Multivariate predictors (N = 392)	
		Unadjusted odds ratio	95% CI	Adjusted odds ratio	95% CI
Formal Education	Any	2.09	1.22–3.91*		
Age	+ 10 years	0.79	0.67–0.93*		
Sex	Male	1.52	0.97–2.37	2.36	1.09–5.13*
Marital status	Married	0.96	0.62–1.49		
Income	>50,000 shillings	1.33	0.85–2.09		
Previous illness (in 12 months)	Any	0.67	0.43–1.06		
Previous admission (in 12 months)	Any	0.82	0.52–1.31		
Knowing a person with HIV	Yes	1.45	0.90–2.34		
More than one sexual partner	Yes	0.75	0.34–1.68		
Condom use (12 months)	<100%	1.06	0.67–1.66		
Know HIV status of partner	Yes	6.29	2.93–13.5		
Previous HIV test	Any	1.13	0.71–1.80		
Duration of admission	Log days	1.45	0.64–3.24		
HIV-related diagnosis	Yes	3.43	2.08–5.68*	11.16	4.68–26.59*

Note. Predictors of being offered HIV testing during hospitalization, among medical inpatients in Mulago hospital, Uganda, July 2003.

\*Statistically significant variables ( $p < 0.05$ ).

N = 392 for being asked to test; testing data was missing for three subjects.

5,000 Uganda shillings (US \$2.50) and over half of the respondents had a monthly income of less than 50,000 Uganda shillings (US\$25). This suggests that cost may represent a significant barrier to counseling and testing service use among those at risk for infection.

We found that the primary barrier to inpatient HIV testing is that this service is not offered routinely to hospitalized adults. When offered, it is highly accepted. In the absence of physician-initiated testing, we found that hospital inpatients rarely request an HIV test. This implies that in the absence of routine inpatient HIV testing, the majority of patients will leave hospitals without determination of serostatus. Provider-initiated approaches have been proposed to enhance treatment and prevention in high prevalence settings (De Cock *et al.*, 2002; De Cock *et al.*, 2003; UNAIDS, 2004). These proposals include diagnostic and routine HIV counseling and testing. In routine HIV counseling and testing, health care providers offer HIV testing to all patients as a standard practice while diagnostic testing and counseling is indicated when individuals present with clinical symptoms suggesting HIV/AIDS (UNAIDS, 2004; WHO, 2002a, b). Considering the high HIV prevalence, the acceptability of testing, and the likelihood of missing many undiagnosed HIV infections by using the diagnostic approach, the most appropriate model for this setting is routine HIV testing with an organized referral system for HIV-positive individuals and prevention counseling with emphasis on partner disclosure. In Botswana, for example, routine opt-out HIV testing is being instituted nationwide (Center for Strategic and International Studies, 2004). UNAIDS also recognizes the role of routine offer for HIV testing by health providers in health care settings where HIV is prevalent and antiretroviral treatment is available (UNAIDS, 2004, WHO, 2002a, b).

A significant proportion of hospitalized adults in our sample reported HIV sexual risk behavior within the preceding year. To date, no studies have investigated the effectiveness of HIV risk reduction counseling delivered to individuals in the setting of hospitalization for acute illness. The first step in evaluating the impact of this intervention for inpatients is to assess the baseline prevalence of risk behavior in this population. Our data suggest that, despite the finding that many inpatients are debilitated with complications of advanced HIV infection, the inpatient population remains at risk for either HIV acquisition or transmission to others. Thus, the inpatient setting

may be a valuable venue for the provision of HIV risk reduction counseling.

We recognize the following limitations of this study: Our sample excluded those who were too sick to participate in the study. Also, the sampling favored those who survived to the day of discharge from the hospital. Medical chart reviews by our group suggest that 16% of patients hospitalized on medical wards in Mulago Hospital die during hospitalization. Mortality is likely to be significantly higher among HIV-positive patients. However, it is those that survive to discharge who are the most likely to benefit from participation in HIV counseling and testing interventions during hospitalization.

In summary, our data suggest that urban hospitals in resource-constrained areas represent an important venue to identify undiagnosed HIV-infected individuals, many of whom may be candidates for ART, and all of whom potentially could be referred for access to a range of other available HIV social and medical care services. Participants in our study indicated that routine inpatient HIV counseling and testing would be highly acceptable if offered. In addition, our findings suggest that the inpatient setting also may be a key venue at which to reduce HIV risk behavior among both HIV-positive and negative individuals through effective counseling strategies. Because of the high morbidity and mortality among hospitalized patients, HIV counseling and testing early in the hospitalization may provide the greatest benefit to patients and their partners. Additional operational research is needed to determine how best to expand HIV counseling and testing services in hospitals throughout sub-Saharan Africa and other areas heavily affected by the HIV pandemic.

## ACKNOWLEDGMENTS

This research was supported by a grant from the National Institutes of Health, University of California San Francisco-Gladstone Institute of Virology & Immunology Center for AIDS Research, P30 AI27763 and the University of California, Berkeley Fogarty International AIDS Training Program (AITRP), The Doris Duke Charitable Foundation and The Bill and Melinda Gates Foundation. We would like to acknowledge the contribution of the following people towards the successful design and conduct of this study: Prof. Andrew Moss and

Richard Clark from UCSF, and the interviewers and patients who participated in the study.

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