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Impact of HIV Testing on Sexual Health Communication in South Africa

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COMPETING INTERESTS

None declared.

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Abstract

Objectives—The South African Government recently launched a national campaign to test 15 million South Africans for HIV by 2011. Little is known about how receipt of HIV testing might influence interpersonal communication. To explore these questions, we examine the effects of prior HIV testing on sexual health communication among South Africans.

Methods—Adults (N = 1,284; 98% Black, 36% women, mean age = 31) residing in a South African township completed street-intercept surveys.

Results—Of the 1,284 participants, 811 (63%) had been tested for HIV. Among those who had been tested, 77% tested negative, 12% tested positive, and 11% did not know their test result or refused to answer. Compared to those who had not been tested, participants who had been tested for HIV were more likely to communicate with community members about (a) HIV/AIDS, (b) getting tested for HIV, and (c) using condoms. Testing positive for HIV was associated with communication with sexual partners about condom use. Among participants who had been tested for HIV, exploratory analyses revealed that those who had engaged in sexual health communication with community members or sexual partners reported more condom-protected sex than those who had not engaged in sexual health communication.

Conclusions—HIV testing is associated with sexual health communication among South African community members and sexual partners. Offering HIV testing to all South Africans may increase communication and lead to reductions in sexual risk.

Keywords

HIV testing; communication; HIV; South Africa; sexual risk

INTRODUCTION

South Africa has the highest rate of HIV in the world with an estimated 5.7 million South Africans living with HIV. [1] Among South African adults over the age of 15, an estimated 380,000 new infections were diagnosed in 2008. Women are disproportionately affected by HIV with an estimated 59% of South African women living with HIV. [1, 2] To reduce the spread of HIV, the World Health Organization (WHO) and Joint United Nations Programmes on HIV/AIDS (UNAIDS) have joined together to expand access to voluntary HIV counseling and testing (VCT). [3]

Voluntary HIV counseling and testing has been shown to be an effective strategy to reduce the spread of HIV by making people aware of their HIV status and promoting safer sex behaviors. [4, 5] VCT also facilitates earlier access to support services, health care and antiretroviral treatment. VCT among South Africans has increased from 47% to 61% between 2006 and 2009. [6] Although rates of VCT have increased, many South Africans remain unaware of their HIV status. Barriers to VCT include basic needs such as availability, transportation, and childcare but may also include fears associated with the possibility of discrimination and/or rejection by sexual partners. [7–11]

In April 2010, the South African Government launched a major campaign to increase HIV counseling and testing with an overarching goal of ensuring that every South African is aware of his or her HIV status. [12] In support of President Zuma's commitment to nationwide HIV counseling and testing, Michel Sidibé, Executive Director of UNAIDS, suggested that in addition to increasing awareness of individual HIV status, this campaign will be a catalyst for “innumerable conversations...about issues that are sometimes difficult to talk about” (p. 2). [13] To date, only a limited number of studies have examined whether HIV testing leads to increased sexual health communications.

Social networks have been shown to have considerable influence on individuals' perceptions of attitudes, intentions, and behaviors acceptable by a group. [14] Most of this research has focused on the negative impact of social networks rather than the positive role of social networks in promoting preventative behaviors, including VCT. [15] Communication theory, such as the diffusion of innovations, [16, 17] suggests that as "trend setters" begin to endorse, model, and discuss HIV prevention, including VCT, within their community, norms shift toward further uptake of the innovation. Recent research across four sites (Tanzania, Zimbabwe, South Africa, and Thailand) found that frequent communications regarding HIV-related protection, risk awareness, testing, and assisting people living with HIV/AIDS, were associated with HIV testing. [18] Moreover, communication about HIV has been shown to increase HIV-related knowledge and reduce HIV/AIDS stigma. [19] Thus, a potential benefit of VCT includes increased sexual health communication within a community.

The primary purpose of this study was to examine the effects of HIV testing on sexual health communication among South Africans. We expected participants who had been tested for HIV would be more likely to communicate with community members about HIV, getting tested, and using condoms and would discuss condom use with sexual partner(s). A secondary purpose was to explore the effects of testing positive for HIV; we expected that those who tested positive would be less likely to engage in sexual health communication due to concerns of stigmatization associated with a positive test. [7, 20, 21] Examining the potential benefits of VCT on sexual health communications may signify changes regarding sexual health norms among South Africans.

METHODS

Participants and Procedures

Participants were 1284 residents (823 men, 460 women) of Gugulethu township, a primarily Xhosa-speaking African community just outside Cape Town, South Africa. Field workers used street intercept methods to sample from six, non-contiguous, neighborhoods within the township. Two neighborhoods were surveyed from June 3 to June 29, 2008, two were surveyed from November 2 to December 7, 2008, and two were surveyed from May 9 to June 28, 2009.¹ Field workers consisted of 12 ethnically-matched residents of the communities who spoke both Xhosa and English. Surveys were administered in the participants' preferred language. Field workers approached pedestrians or shebeen patrons and requested their participation in a survey, described as "research regarding HIV/AIDS ... that may benefit your community." If individuals were interested, they provided verbal consent and then completed a nine-page anonymous survey in exchange for a small non-monetary gift (a keychain). Surveys were typically self-administered; however, if a prospective participant did not possess adequate literacy skills, the surveys were administered by the field worker as an interview. All procedures were approved by the Institutional Review Boards of the Human Sciences Research Council, University of Connecticut, and Syracuse University.

Measures

Surveys assessed (a) demographic information (e.g., age, gender, ethnicity), (b) HIV testing history, (c) sexual health communication and norms, and (d) additional measures (e.g., alcohol use) as part of a larger study.

¹Data collection for this study occurred prior to President's Zuma's launch of the national HIV counseling and testing program in South Africa.

HIV Testing History—History of HIV testing was assessed using two items: (a) Have you ever been tested for HIV? (yes, no) and (b) If you have been tested, what were the results of your most recent test? (positive, negative, don't know, refuse to answer). Responses to these two questions were used to categorize people into groups based on whether they had ever been tested for HIV (1 = yes, 0 = no) and HIV serostatus (1 = positive, 0 = negative).

Sexual Health Communication—Communication regarding HIV testing and sexual risk behaviors was assessed using several items. Participants were asked about the last time they talked with community members about (a) HIV/AIDS, (b) getting tested for HIV, and (c) using a condom. Response options were never, yes but not in the past 30 days, and in the past 30 days. To assess communication within the community, we recoded these responses to reflect any communication in the past or present (1) or no communication (0). Communication with sexual partner(s) was assessed by asking participants “in the past 30 days, how many times have you talked with a sex partner about using condoms” (total number of events).

Communication Norms—Norms regarding communication about HIV were assessed using a single item: “People in our community can talk openly about HIV/AIDS.” Response options ranged from strongly disagree (1) to strongly agree (4).

Data Management and Analysis

Summary statistics (means and standard deviations, frequencies) were used to describe sample characteristics and communication for the overall sample. Differences between individuals who had been previously tested or not tested for HIV were examined using a series of univariate logistic regression analyses. Demographic variables that differed significantly between those who had or had not been tested for HIV were included in subsequent analyses. To test our predictions, we used logistic regression analyses to examine the association between prior HIV test and sexual health communication with community members and sexual partners. Specifically, the probability of communication regarding HIV/AIDS, getting tested for HIV, and advising condom use with community members (yes, no) or condom use communication with sexual partner (yes, no) was predicted from prior HIV test (yes, no). Four separate models were used to examine the effects of prior HIV test on each type of communication (HIV/AIDS, getting tested for HIV, and advising condom use with community members; condom communication with sexual partners). Continuous variables were examined for skewness. The variable “number of times participant talked with sexual partner about using condoms” was skewed and clustered at zero, with the variance surrounding the means indicating a high degree of overdispersion; therefore, negative binomial regression analysis was used to model this variable. In order to control the overall Type I error rate at the 0.05 level, an adjustment of the *P*-values was performed due to the multiple comparisons (8). Following procedures presented by Holm, [22] the *p*-values were ranked and sequentially adjusted for the number of statistical tests performed. All data analyses were conducted using Stata 11.0.

RESULTS

Characteristics of the Sample

We restricted our analyses to the 1,284 (out of 1,294) participants who responded to the question regarding HIV testing history. Table 1 reports the overall characteristics of the sample and by HIV testing behavior. Most (98%) of the participants were Black Africans with a mean age of 31 (SD = 8.45; interquartile range [IQR] = 25–36). Some (20%) participants reported being married and had a median of 1 child (IQR = 1–2). Over half were

employed (54%), 43% had completed the equivalent of high school, and 12% had attended at least some college.

Overall, 30% of participants reported having two or more sexual partners in the past 30 days (Table 1). Most participants reported having sex with a partner of the opposite sex (82%), 3% (25 men, 12 women) reported sex with a same sex partner, 2% (19 men, 4 women) reported having sex with both men and women; 12% (151/1284) of the sample did not have a sexual partner in the past 30 days (data not tabled). Condoms were used for 49% of vaginal or anal sex events. Nearly two-thirds of participants (38%) reported being diagnosed with an STI at least once in their lifetime.

HIV Testing History

Of the 1,284 participants, 811 (63%) reported having been tested for HIV. Among those who were tested, 623 (77%) were HIV negative, 97 (12%) were HIV positive, 52 (6%) refused to answer, and 39 (5%) didn't know their test results. Comparisons between participants who had or had not been tested for HIV indicated that individuals who had been tested for HIV tended to be women (40% vs. 29%), with at least a high school education (59% vs. 46%), and were currently employed (57% vs. 48%). Participants who had been tested for HIV reported fewer sexual partners (27% vs. 35%), more condom-protected vaginal or anal sex events (mean = 51% vs. 45%), and were less likely to report being diagnosed with an STI (19% vs. 49%) compared to those who had not been tested. No other differences in demographic or risk variables between those who had or had not been tested for HIV were found (see Table 1).

Sexual Health Communication

Participants tended to agree that people in the community can talk openly about HIV/AIDS (mean = 3.05, SD = 0.99). Many participants communicated with community members about HIV/AIDS (61%), getting tested for HIV (64%), and condom use (75%). Participants reported discussing condom use with their partners on average 6 times (SD = 14.58) in the past month. Bivariate analyses indicated that compared to those who had not been tested, participants who had been tested for HIV were more likely to communicate with community members about HIV/AIDS (66% vs. 53%), getting tested (71% vs. 51%), and condom use (80% vs. 67%). Prior HIV testing was associated with condom use discussions with sexual partner(s); that is, participants who had been tested for HIV reported discussing condoms with their sexual partner(s) an average of 7 times (vs. 5 times for participants who had not been tested) in the past month (see Table 1).

Communication by Prior HIV Testing Status

Logistic regression analyses were used to predict the probability of sexual health communication (yes, no) from prior HIV testing (yes, no) controlling for demographic variables that distinguished the testing groups (gender, education, and employment) and communication norms (Table 2). Prior HIV testing was significantly associated with communication among community members about HIV/AIDS (adjusted OR = 1.57, 95% CI = 1.23, 2.00), talking with others about getting tested for HIV (adjusted OR = 2.24, 95% CI = 1.75, 2.86), and advising someone to use a condom (adjusted OR = 1.86, 95% CI = 1.42, 2.44). As shown in Figure 1, participants who had been previously tested for HIV were more likely to discuss HIV/AIDS, getting tested for HIV, and condom use with community members compared to those who had never been tested for HIV.

To examine communication with sexual partners, we used a negative binomial regression model to predict the probability of communicating with partners about condom use based on prior HIV testing (yes, no) and controlling for gender, education, employment, and

communication norms (Table 2). Prior HIV testing was associated with partners communication about condom use (incident RR = 1.40, 95% CI = 1.05, 1.86) but did not reach significance after adjusting the *P*-value for Type I error.

Communication by HIV-Serostatus

Regression analyses were used to examine sexual risk reduction communication among those who had tested positive or negative for HIV (*n* = 720). As shown in Table 2, logistic regression analyses evaluated the association between sexual health communication among community members and HIV-serostatus after controlling for gender, education, employment, and communication norms. Testing positive for HIV was not associated with communication about HIV/AIDS (adjusted OR = 1.91, 95% CI = 1.15, 3.19) and talking with others about getting tested for HIV (adjusted OR = 1.73, 95% CI = 1.01, 2.95) after adjusting the *P*-value for Type I error. HIV-positive participants were more likely to advise community members to use condoms compared to those who were HIV-negative (87% vs. 80%; adjusted OR = 1.80, 95% CI = 0.96, 3.81); these results were not statistically significant. Negative binomial regression analyses showed that participants testing positive for HIV were more likely to discuss condom use with their sexual partner (incident RR = 2.12, 95% CI = 1.42, 3.18). As shown in Figure 2, participants diagnosed with HIV discussed using condoms with a sexual partner 11 times (SD = 22.29) compared to 5 times among those who had tested negative for HIV (SD = 10.43).

Exploratory Analyses

Exploratory analyses examined whether participants who communicated with community members or sexual partners about sexual risk reduction engaged in more protected sex. Controlling for gender, education, employment, communication norms, and HIV testing history, analyses show that participants who communicated with community members about HIV/AIDS ($\beta = 0.12$, *P* = .001), getting tested for HIV ($\beta = 0.11$, *P* = .001), and advising condom use ($\beta = 0.20$, *P* = .001) reported more condom-protected events than those who did not communicate with community members. Participants who had discussed condom use with sexual partners were more likely to use condoms than those who had not after controlling for demographics, norms, and HIV testing history ($\beta = 0.20$, *P* = .001).

DISCUSSION

In the country with the highest per capita rate of HIV in the world, we examined the association between voluntary HIV counseling and testing on sexual health communication. Two primary findings emerged. First, history of HIV testing was significantly associated with sexual health communication among community members. Second, testing positive for HIV was also associated with sexual health communication with sexual partner(s). These two findings suggest that VCT provides a secondary benefit, namely, a mechanism to increase interpersonal communication about HIV, getting tested, and promoting protective behaviors.

The findings corroborate prior research showing that HIV testing is associated with increased sexual health communication among community members. [18] The cross-sectional nature of these studies prevents strong inferences regarding the directionality of the association between HIV testing and communication. It is possible that increased interpersonal communication prompts individuals to seek HIV testing. Nonetheless, consistent with diffusion of innovation theory, [16] we suggest that the “trend setters” are those who seek to improve their sexual health, get tested for HIV, and subsequently discuss sexual health with community and sexual partner(s). Prior research also demonstrates that people who communicate about behavior change to others are more likely to adopt risk

reduction behaviors themselves, [23] consistent with cognitive dissonance theory. [24] Future research might examine HIV testing behavior longitudinally to determine the sequence of testing (including the context and motivations associated with obtaining an HIV test) and sexual health communications.

We extended prior research [18, 19] by demonstrating a consistent effect of testing across specific communication topics (i.e., HIV, getting tested, and condom use) among community members. We also examined the association between communication and HIV test result (i.e., comparing individuals who tested positive or negative). These findings have implications in the development of sexual risk reduction interventions. Interventionists seeking to improve interpersonal sexual health communication should consider including VCT as part of their sexual risk reduction intervention. Interventionists should also consider providing interpersonal skills training to facilitate communication with community members and sexual partner(s).

Several factors are important in interpreting these findings. First, data were gathered from self-reports, which are imperfect indicators of behavior. To minimize socially desirable responding, [25] field staff emphasized that all data were anonymous. Second, the respondents sampled may not be representative of the larger community; however, we used street intercept surveys, a methodology that provides access to the widest range of community members and minimizes the self-selection bias often seen with clinical or other recruitment strategies. [26] Third, a number of HIV-related studies have been conducted in Gugulethu township; thus, our sample may have been exposed to previous public health campaigns that may have affected their serological testing and communication behaviors. Fourth, our data are cross-sectional and do not support causal inferences. Longitudinal data can provide strong evidence of directionality of influences between HIV testing and communication.

Conclusions

One of the South African Government's new strategic goals is to reduce vulnerability to HIV by "establishing a national culture in which all people in South Africa regularly seek voluntary testing and counseling for HIV" (p.57). [27] Our study suggests that uptake of voluntary HIV counseling and testing could have an added benefit of increasing sexual health communication among South Africans. Despite the continued rise in South Africa's HIV epidemic, the South African Government's decision to provide HIV counseling and testing to 15 million individuals by 2011 may prove to be a turning point in the fight against HIV by influencing communication norms associated with HIV in South Africa.

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Key Messages

- HIV testing is associated with sexual health communication among South Africans.
- Testing positive for HIV is associated with sexual health communication with both community members and sexual partners.
- Offering HIV testing to all South Africans may increase sexual health communication and lead to reductions in sexual risk behaviors and subsequent infections.

Figure 1. Proportion of participants communicating with community members regarding HIV/AIDS, getting tested for HIV, and using condoms as a function of HIV testing history.

Figure 2.
Mean number of discussions about condom use with sexual partners by HIV-serostatus.

Table 1

Characteristics of the sample overall and by prior HIV testing*

Variables	HIV Testing				P value
	Overall (N = 1,284)	Tested	Not Tested	OR (95% CI)	
		(n = 811)	(n = 473)		
Demographics					
Age	31.18 (8.45)	31.12 (7.88)	31.29 (9.35)	1.00 (0.98, 1.01)	.733
Gender (% women)	36%	40%	29%	1.57 (1.23, 2.00)	.000
Ethnicity (% Black)	98%	97%	98%	0.77 (0.35, 1.69)	.509
Employment (% employed)	53%	57%	48%	0.68 (0.54, 0.86)	.001
Education (% high school or beyond)	54%	59%	46%	1.67 (1.33, 2.10)	.000
Married (% yes)	21%	20%	22%	1.17 (0.88, 1.55)	.272
Number of children	1.46 (1.21)	1.46 (1.15)	1.45 (1.30)	1.01 (0.92, 1.11)	.893
Sexual Risk Factors					
Sexual partners (% 2 partners)	30%	27%	35%	0.70 (0.55, 0.90)	.005
Condom use (mean %)	0.49 (0.39)	0.51 (0.38)	0.45 (0.40)	1.43 (1.02, 1.99)	.037
Diagnosed with an STI	38%	19%	49%	0.25 (0.19, 0.32)	.000
Communication					
Communication norms	3.05 (0.99)	3.04 (1.01)	3.07 (0.96)	0.97 (0.87, 1.09)	.612
HIV/AIDS communication (% yes)	61%	66%	53%	1.74 (1.37, 2.19)	.000
Testing communication (% yes)	64%	71%	51%	2.42 (1.91, 3.06)	.000
Advised condom use (% yes)	75%	80%	67%	1.95 (1.51, 2.53)	.000
No. times discussed condom use, partner	6.33 (14.58)	7.08 (15.11)	5.03 (13.53)	1.72 (1.36, 2.18)	.000

* Data are given as mean (SD) except where noted. OR, odds ratio; CI, confidence interval.

Table 2

Regression analyses examining the effects of HIV testing or HIV serostatus on sexual risk reduction communication with community members and sexual partner(s)^{*}

	Community Members						Sexual Partner(s)	
	HIV/AIDS			HIV Testing			Using Condoms	
	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P	IRR (95% CI)	P
Full Sample [†]								
Gender	1.67 (1.30, 2.14)	.000	1.64 (1.27, 2.12)	.000	1.13 (0.85, 1.50)	.391	1.15 (0.89, 1.49)	.278
Education	1.29 (1.02, 1.64)	.037	1.17 (0.91, 1.49)	.215	1.40 (1.07, 1.84)	.014	0.87 (0.68, 1.13)	.303
Employment	0.74 (0.58, 0.94)	.014	0.75 (0.58, 0.95)	.019	0.90 (0.68, 1.17)	.423	0.85 (0.66, 1.10)	.216
Communication norms	1.36 (1.21, 1.53)	.000	1.33 (1.18, 1.50)	.000	1.45 (1.28, 1.65)	.000	0.84 (0.74, 0.96)	.008
Tested for HIV	1.57 (1.23, 2.00)	.006	2.24 (1.75, 2.86)	.007	1.86 (1.42, 2.44)	.008	1.40 (1.05, 1.86)	ns
Subsample with known HIV serostatus (n = 720) [‡]								
Gender	1.86 (1.33, 2.60)	.000	1.79 (1.26, 2.54)	.001	1.22 (0.82, 1.81)	.331	0.93 (0.70, 1.23)	.614
Education	1.24 (0.89, 1.73)	.208	1.05 (0.74, 1.49)	.787	1.31 (0.88, 1.95)	.183	0.92 (0.70, 1.21)	.534
Employment	0.90 (0.64, 1.25)	.517	0.86 (0.61, 1.21)	.379	0.87 (0.59, 1.29)	.485	0.64 (0.48, 0.84)	.002
Communication norms	1.30 (1.11, 1.52)	.001	1.31 (1.11, 1.53)	.001	1.44 (1.20, 1.72)	.000	0.95 (0.82, 1.10)	.502
Tested positive for HIV	1.91 (1.15, 3.19)	ns	1.73 (1.01, 2.95)	ns	1.80 (0.96, 3.81)	ns	2.12 (1.42, 3.18)	.010

^{*} Logistic regression analyses were used to assess communication with community members regarding HIV/AIDS, HIV testing, and advising condom use (binary dependent variables). Negative binomial regression with robust variance estimation was used for the number of times participants talked with a sex partner about using condoms (count dependent variable). Communication norms is a continuous variable and was centered; all other variables were dummy-coded (gender: 1 = female, 0 = male; education: 1 = high school or beyond, 0 = less than high school; employment: 1 = unemployed, 0 = employed; tested for HIV: 1 = tested, 0 = not tested).

AOR = adjusted odds ratio; CI = confidence interval; IRR = incidence rate ratio. Exact P-values for tested for HIV and tested positive for HIV were adjusted using Holm's procedure; [22] ns, non-significant result based on Holm's procedure.

[†] Overdispersion parameter for communication with sexual partner, alpha = 4.07 (95% CI = 3.67, 4.52)

[‡] Overdispersion parameter for communication with sexual partner, alpha = 3.12 (95% CI = 2.72, 3.58)