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# Perceived HIV-related stigma among university students in South Africa: implications for HIV testing

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HIV-related stigma, and particularly perceived stigma, has a negative impact across the HIV care continuum. This study adds to our understanding of stigma by assessing how perceived stigma varies from one context to another and how such differences are associated with the location where individuals would prefer an HIV test. We used self-administered questionnaire data ( $n = 378$ ) obtained from a convenience sample of students (18 years and older) attending a tertiary education institution in Durban, South Africa. Perceived stigma in the university environment was compared to perceived stigma in the home community environment. Multiple logistic regression analysis tested whether a higher level of perceived stigma in one setting was associated with a preference for HIV testing in the other setting. While levels of symbolic stigma and discrimination were low, a large proportion of the sample perceived that people living with HIV experience some form of stigmatisation in the home community and university environments (47% vs 41%,  $p = 0.09$ ). A total of 31% reported less perceived stigma in the university environment. Students who perceived less stigma in the university environment were significantly more likely to report a preference for HIV testing at the university clinic rather than at a clinic in their community (aOR: 2.03;  $p < 0.01$ ). Perceptions common across settings that people living with HIV experience stigmatisation are of great concern, especially for efforts to increase demand for HIV testing among young people. Results suggest that HIV-testing services in environments perceived to be less stigmatising than home communities could provide preferred alternatives for HIV testing.

**Keywords:** barriers, community, discrimination, HIV/AIDS, perceptions, perceived stigma, stigmatising attitudes, young people

## Introduction

Antiretroviral therapy (ART) has the potential to curb the HIV epidemic. ART reduces AIDS-related morbidity and mortality (Antiretroviral Therapy Cohort Collaboration, 2017; Bor, Herbst, Newell, & Bärnighausen, 2013; Insight Start Study Group, 2015; Temprano ANRS 12136 Study Group, 2015) and prevents the onward transmission of HIV (Cohen et al., 2011; Tanser, Bärnighausen, Grapsa, Zaidi, & Newell, 2013). The UNAIDS 90-90-90 targets were established to help maximise the therapeutic and HIV-prevention gains from ART. The targets, to be achieved by 2020, are to have 90% of all people living with HIV aware of their HIV status; 90% of all people with diagnosed HIV infection receiving ART; and 90% of all people receiving ART achieving viral suppression (UNAIDS, 2014). Success in reaching these targets hinges on ensuring that 90% of people living with HIV are diagnosed and know their HIV status. Accordingly, uptake of HIV-testing services is essential. In particular, we need to increase the relatively poor demand for HIV testing among young adults (Maughan-Brown, Lloyd, Bor, & Venkataramani, 2016). In South Africa, the country with the largest epidemic globally, the proportion of undiagnosed young (15–24 years old) people living with HIV is high, with

estimates of more than a third nationally (Johnson, Rehle, Jooste, & Bekker, 2015) and 56% in specific regions of the country (Huerga et al., 2016).

HIV-related stigma has a negative impact across the entire HIV care continuum and is a significant impediment to achieving the UNAIDS 90-90-90 target. HIV-related stigma is a multi-dimensional construct comprising separate components that may have different effects on health-seeking behaviours (Maughan-Brown & Nyblade, 2014). Studies have demonstrated that uptake of HIV testing can be hindered both by symbolic stigma (Berendes & Rimal, 2011; Hutchinson & Mahlalela, 2006; Kalichman & Simbayi, 2003) and by perceived stigma (Maughan-Brown & Nyblade, 2014; Turan et al., 2011). HIV-related symbolic stigma is based on negative moral judgements of individuals perceived to have been infected with HIV through what is assumed to be immoral and/or irresponsible behaviour and is informed by the social meanings attached to HIV and the people who are living with HIV (Herek, 2002). Perceived HIV-related stigma refers to perceptions on the part of individuals about the nature and level of stigma in the broader social environment. This is a generalised perception of how other people feel and react towards people living with HIV (Green, 1995; Zelaya et al., 2008).

In South Africa, studies have documented symbolic stigma among general populations (Abdool Karim, 2011; Kalichman & Simbayi, 2003; Mall, Middelkoop, Mark, Wood, & Bekker, 2013), young adults (Maughan-Brown, 2010), healthcare workers (Famoroti, Fernandes, & Chima, 2013), school pupils (Maughan-Brown & Spaull, 2014) and patrons of informal drinking places (Pitpitan et al., 2012). Consistent with these findings, people living with HIV have themselves reported a wide range of experiences of stigma and discrimination (Abdool Karim et al., 2008; Peltzer & Ramlagan, 2011; Simbayi et al., 2007). As expected, in this context levels of perceived stigma are high (Maughan-Brown & Nyblade, 2014; Visser, Makin, Vandormael, Sikkema & Forsyth, 2009).

Perceived stigma may act as a significant barrier to HIV testing because individuals who believe that people living with HIV are stigmatised are more likely to be concerned about being stigmatised themselves, should they test positive. In terms of the different components of stigma, perceived stigma may be of particular significance for the uptake of HIV testing because levels of perceived stigma are often greater than levels of symbolic stigma (Genberg et al., 2008; MacPherson et al., 2011; Visser et al., 2009). This difference is likely due, in part, to perceived stigma being a product of social learning, and stories and reports of stigmatising experiences are bound to exacerbate perceptions about the nature and level of stigma (Green, 1995). One case of an individual being stigmatised could therefore result in widespread perceived stigma.

While we know that many individuals perceive that people living with HIV are generally stigmatised, limited data on this exists among university students. There is also a paucity of data on how perceived HIV-related stigma varies from one context to another. As a product of social learning, it is possible that perceived stigma could be context specific, with an individual perceiving people living with HIV to experience different degrees of stigmatisation in different settings. Perceived stigma could vary within different contexts (e.g., home community, workplace, school and place of worship), as the factors that influence an individual's perception of the degree of stigmatisation likely vary across settings. For example, contact with people living with HIV is associated with perceived stigma (Visser et al., 2009), and the number of people living with HIV known to an individual will likely vary between spheres of life. Our understanding is therefore also limited as to whether differences in perceived stigma across contexts influence HIV-testing preferences.

This study used data from South African students to assess how perceived stigma within the home community environment compares to perceived stigma in the tertiary education environment. We also assess how differences in perceived stigma between settings are associated with the location where individuals would prefer to have an HIV test.

## Methods

### Data

Data were collected in September and October 2014 among students attending a tertiary institution in Durban, KwaZulu-Natal province, South Africa. Study recruitment was carried out by convenience sampling in several locations (e.g., outside the library, cafeteria and lecture halls). A research intern, who was never a student at the university and had

very little contact with the student population, recruited participants. Eligibility criteria for the study were: (1) aged 18 years and older; (2) enrolled as a full-time student at the tertiary institution (in any year of study); and (3) willing and able to provide written informed consent. Of the 454 eligible students approached for enrolment, 378 (83%) completed the self-administered questionnaire. The questionnaire was compiled in English, given that this is the medium of instruction at the institution. The questionnaire was completed in private. The survey, previously developed by Verhave (2012), was piloted before administration to ensure that language was appropriate for the local context. The survey included items to assess symbolic stigma, perceived stigma in both the home community and university environments, and preferences for HIV testing. The study was approved by the Institutional Research Ethics Committee of the Durban University of Technology (IREC 057/14).

### Measures

Symbolic HIV-related stigma (the moral component of stigma) was assessed using responses to five statements along a 5-point Likert scale (strongly disagree, disagree, don't know, agree or strongly agree). For example, one statement read "Families of people with HIV should be ashamed". Statements commonly used in assessments of symbolic stigma in South Africa were selected for inclusion in the survey (Kalichman & Simbayi, 2003; Pitpitan et al., 2012; Visser et al., 2009). Binary variables were created to identify individuals who agreed (i.e., either agreed or strongly agreed) to each statement. We dichotomised responses to all the stigma measures in this manner because there was little variation across the 5-point Likert scale for most measures. Respondents tended to answer, strongly disagree, agree or don't know. A binary variable was created to identify individuals who agreed with any of the statements.

To assess the overall level of symbolic stigma, a symbolic stigma score (0–20) was created by summing responses (strongly disagree = 0; disagree = 1; don't know = 2; agree = 3; or strongly agree = 4) to the five statements relating to symbolic stigma. The Cronbach alpha reliability coefficient for the five symbolic stigma measures was 0.73, which is satisfactory for a scale assessing various aspects of symbolic stigma.

Discrimination was assessed using responses to three statements relating to punitive action against people living with HIV (e.g., It is reasonable for an employer to fire people who have HIV/AIDS). A binary variable was created to indicate individuals who agreed to any statement. A discrimination score (0–12) was created by summing responses (strongly disagree = 0; disagree = 1; don't know = 2; agree = 3; or strongly agree = 4) to the three statements relating to discrimination. The Cronbach alpha reliability coefficient for the three discrimination measures was 0.73.

Perceived stigma in the university environment was measured using responses (along the 5-point Likert scale) to four statements: 1) People with HIV/AIDS in the university environment face rejection from their peers; 2) People with HIV/AIDS in the university environment face verbal abuse or teasing; 3) People who are suspected of having HIV/AIDS in the university environment lose respect; 4) People with HIV in the university environment face physical abuse. Perceived stigma within the home community environment

was measured by repeating each of the statements above with reference to the home community environment setting. For example, “People with HIV/AIDS in my home community face rejection from their peers”.

We created binary variables to measure any level of perceived stigma in each setting. The first identified individuals who agreed to any of the statements regarding perceived stigma in the university environment. The second identified individuals who agreed to any of the statements regarding perceived stigma in the home community environment. A perceived stigma score (0–16) for each setting was created by summing responses (strongly disagree = 0; disagree = 1; don't know = 2; agree = 3; or strongly agree = 4) to the four statements relating to perceived stigma. The Cronbach alpha reliability coefficient for the four measures of perceived stigma within the university environment was 0.77, and 0.87 for the four measures of perceived stigma relating to the home community setting.

The ordinal nature of the perceived stigma scores was brought into question as a result of many “don't know” responses in the survey. This resulted in many scenarios in which higher order categories could be considered to represent less perceived stigma. For example, an individual who responded “don't know” to all four perceived stigma statements scored an eight, while an individual who agreed to two statements and strongly disagreed with the other two statements scored a six. It is reasonable to conclude that an individual who thinks that people living with HIV face rejection and physical abuse, for example, perceives more stigma than someone who is generally uncertain about perceived stigma. To obtain a better distinction between individuals with higher versus lower degrees of perceived stigma we accordingly created an additional measure of the number of perceived stigma statements that an individual agreed to (i.e., a perceived stigma count ranging from 0 to 4). The perceived stigma count relating to the university setting was subtracted from the count in the home community setting, to provide an indicator (–4 to +4) of which setting was perceived to have greater levels of stigma. Negative numbers represented less perceived stigma in the university environment, while the value zero represented the same level of perceived stigma in each setting. A binary independent variable was created to identify all individuals who agreed to fewer perceived stigma statements in the university environment.

Preference on location of HIV-testing services was assessed using the question: Do you think it's better to get tested for HIV at the university clinic rather than the clinic in your home area? A binary variable was created to identify individuals who thought it was better to get tested at the university clinic.

### Analysis

We first computed descriptive statistics for the sample characteristics and stigma measures for the full sample. Chi-square tests were used to assess gender differences in the agreement to each stigma measure and in the proportion reporting stigma on any measure. We used *t*-tests to assess gender differences in the average of the symbolic stigma, discrimination and perceived stigma scores.

The sample was then restricted to all individuals with data on all perceived stigma measures ( $n = 359$ ) to assess

differences in perceived stigma across settings among a consistent sample. A few observations were excluded ( $n = 19$ ) from this analysis due to missing data. Chi-square tests were used to assess differences in the agreement to each stigma measure, and in the difference in the proportion reporting perceived stigma on any measure. To assess differences across settings in the average of the perceived stigma scores, *t*-tests were used. The Pearson correlation coefficient was used to assess the relationship between the perceived stigma scores.

Logistic regression analysis was then used to test whether a higher level of perceived stigma in one setting was associated with a preference for HIV testing in the other setting. Specifically, the models used a binary indicator of preference for testing at the university clinic as the dependent variable, with the reference category representing individuals who reported no preference or a preference for testing at the clinic in their home community. Two models were run with separate independent variables. The first model included a measure of the difference in the number of perceived stigma items agreed to as the key independent variable of interest. This independent variable ranged from –4 to 4, with higher values representing lower levels of perceived stigma at the university (which is synonymous with higher perceived stigma in the community). The second model included a binary independent variable representing individuals who agreed to fewer of the perceived stigma statements relating to the university environment.

The following control variables were used in the multivariable models: gender, age, population group, religious affiliation, home location (urban or rural), symbolic stigma (any = 1), discrimination (any = 1), HIV testing (ever = 1) and an HIV knowledge score (0–7; based on the sum of correct answers (true or false) to seven HIV knowledge questions). The knowledge scale included the following items: (1) A person can get HIV by sharing a glass of water with someone who has HIV; (2) Pulling out the penis before a man climaxes/cum keeps a woman from getting HIV during sex; (3) Showering/washing one's genital/private parts, after sex keeps a person from getting HIV; (4) Having sex with more than one partner can increase a person's chances of being infected with HIV; (5) ARVs (antiretroviral drugs) cure AIDS; (6) An HIV-infected individual should take ARVs every day for the rest of his/her life; and (7) HIV can become resistant to treatment if treatment is defaulted.

All analyses were conducted using Stata 15.0 (Stata Corporation LP, College Station, TX).

## Results

### Demographics

Table 1 shows the demographic characteristics of the 378 study participants. Approximately half the sample was female (52%). Most students were younger than 22 years old; the female group was slightly younger (mean: 21.3 years) than the males (mean: 22.3 years). Most students were black African (62%), resided in urban areas (68%) and of the Christian faith (74%). Overall, knowledge about HIV was mixed, with 96% responding correctly to some questions, but many also reporting incorrect knowledge about HIV prevention and ART. Overall, 67% of the enrolled students had previously tested for HIV (males: 70%; females: 64%).

### Symbolic stigma and discrimination

Levels of symbolic stigma and discrimination/distancing (Table 2) were low with only a few respondents agreeing with each of the statements. The greatest proportion that endorsed symbolic stigma in response to any particular statement was 3% (in response to both statements about shame). Symbolic stigma was more common among males, with significantly more males expressing symbolic stigma on at least 1 measure (males: 12%; females: 1%;  $p < 0.01$ ). The average of the stigma score (0–16) was low overall, and also higher among males (2.05 vs 1.23,  $p < 0.01$ ).

Overall, only 2% endorsed discriminatory attitudes to the statements “It is reasonable for an employer to fire people who have HIV/AIDS” and “I don’t want to be friends with someone who has HIV/AIDS”. More males reported discriminatory attitudes to any of the three statements (males: 6%; females: 2%;  $p = 0.04$ ), although absolute differences were small. Similarly, the average of the discrimination score (0–12) was low overall, and slightly higher among men (0.97 vs 0.64,  $p = 0.04$ ).

### Perceived stigma in the university and home community environment

Table 3 displays perceived stigma among the full sample. A total of 41% reported some perceived stigma in the university environment. The difference in the proportion between males and females who reported any perceived stigma in the university environment was small and not statistically significant (males: 42%, females: 39%,  $p = 0.54$ ).

Forty-eight per cent of the sample reported some perceived stigma in the home community environment. The gender difference in the proportion reporting any perceived stigma in this environment was also not significantly different (males: 51%, females: 43%,  $p = 0.13$ ). Significant uncertainty was evident about stigma in both settings, but particularly high in the university setting. For example, 39% of males and 52% of females reported “don’t know” to whether people living with HIV face physical abuse in the university setting. This represents significant uncertainty about an extreme manifestation of stigma. The overall perceived stigma scores relating to each of the settings was slightly below the mid-point of the 0–16 scale (university setting: 6.27; home community setting: 6.46). Gender differences for each of the scores were small and statistically insignificant.

Table 4 displays differences in perceived stigma between the university and home community environments among the sample with data on all perceived stigma measures ( $n = 359$ ). A significantly larger proportion of students perceived stigma within the community setting for three of the statements, with the largest difference (33% vs 18%,  $p < 0.01$ ) being the perception that people living with HIV face rejection from their peers. Uncertainty about whether people face stigma was common overall, and significantly greater for all measures in the university setting.

Overall, the proportion of individuals who reported any perceived stigma was slightly greater in relation to the home community environment than the university one (46% vs 40%,  $p = 0.097$ ). In addition, significantly more

**Table 1:** Sample characteristics

	Overall $N = 378$ % ( $n$ )	Male $N = 182$ % ( $n$ )	Females $N = 196$ % ( $n$ )
Age groups			
$\leq 21$ years	61 (228)	57 (102)	65 (126)
22–26 years	32 (119)	35 (62)	29 (57)
$\geq 27$ years	7 (26)	8 (15)	6 (11)
Race			
Black	62 (235)	68 (124)	57 (111)
Coloured	0.5 (2)	0.5 (1)	0.5 (1)
Indian	22 (82)	15 (28)	28 (54)
White	16 (59)	16 (29)	15 (30)
Home location			
Urban	68 (258)	65 (119)	71 (139)
Religion			
Christian	74 (278)	75 (137)	72 (149)
Hinduism	15 (56)	9 (17)	20 (39)
Other	6 (24)	9 (16)	4 (8)
No religion	5 (20)	7 (12)	4 (8)
HIV knowledge (examples from four of the items)			
Having sex with more than one partner can increase a person’s chance of being infected with HIV [proportion answering “True”]	96 (361)	93 (170)	97 (191)
Pulling out the penis before a man climaxes/ prevents a woman from getting HIV during sex [proportion answering “False”]	79 (297)	76 (137)	82 (160)
ARVs cure AIDS [proportion disagreeing]	79 (297)	79 (143)	79 (154)
ARVs suppress the virus (viral load) in the body [proportion agreeing]	73 (272)	70 (126)	76 (146)
Ever tested for HIV	67 (247)	70 (124)	64 (123)

All percentages are rounded to the nearest whole number and therefore may not always total 100%

$N$  refers to total sample size. The  $N$  varies slightly for some variables due to a small amount of missing data. The HIV testing variable was missing the most data (total  $N = 370$ , male:  $N = 178$ , female:  $N = 192$ )

$n$  refers to the size of the subset of the sample

“Coloured” is a common and socially acceptable term for mixed race in South Africa

**Table 2:** Symbolic stigma and discrimination

		Overall % (n)	Males % (n)	Females % (n)
<b>Symbolic stigma</b>				
Families of people with HIV should be ashamed	Agree	3 (10)	4 (8)	1 (2)
	I don't know	4 (14)	4 (8)	3 (6)
People with HIV should be ashamed	Agree	3 (12)	5 (10)	1 (2)
	I don't know	3 (11)	4 (7)	2 (4)
People with HIV/AIDS are cursed	Agree	2 (6)	3 (5)	1 (1)
	I don't know	5 (17)	5 (9)	4 (8)
People with HIV/AIDS are dirty	Agree	1 (3)	2 (3)	0 (0)
	I don't know	3 (13)	4 (7)	3 (6)
People with HIV must have done something wrong and deserve to be punished	Agree	2 (7)	4 (7)	0 (0)
	I don't know	4 (16)	6 (11)	3 (5)
Any symbolic stigma		6 (23)	12 (21)	1 (2)
Mean symbolic stigma score (0–20)		1.63	2.05	1.23
<b>Discrimination</b>				
It is reasonable for an employer to fire people who have HIV/AIDS	Agree	2 (6)	2 (4)	1 (2)
	I don't know	4 (14)	5 (10)	2 (4)
People with HIV/AIDS should be isolated from other people	Agree	1 (4)	2 (3)	1 (1)
	I don't know	2 (6)	3 (5)	1 (1)
I don't want to be friends with someone who has HIV/AIDS	Agree	2 (7)	3 (5)	1 (2)
	I don't know	4 (13)	4 (8)	3 (5)
Any discrimination		4 (13)	6 (10)	2 (3)
Mean discrimination score (0–12)		0.80	0.97	0.64

All percentages are rounded to the nearest whole number

The sample size varied slightly between variables ( $N = 374$  to  $378$ ) due to a small amount of missing data  
 $n$  refers to the size of the subset of the sample

participants (33% vs 21%,  $p < 0.01$ ) agreed to 2 or more of the perceived stigma statements relating to the community context than those relating to the university context. It was common for participants who perceived any stigma in one environment to also perceive some stigma in the other. For example, 75% of participants who reported any perceived stigma in the university setting also reported perceived stigma in the community setting.

The perceived stigma scores were similar across settings (university: 6.25; home community: 6.45), with the difference between scores small and statistically insignificant. Perceived stigma scores were similar despite perceived stigma being more common (in terms of agreement to individual statements) in relation to the home community environment. This was due to the large number of participants who answered “don't know” to the perceived stigma statements relating to the university environment, which inflated the perceived stigma score for that setting. The Pearson correlation coefficient for the relationship between the two perceived stigma scores was 0.62.

The analysis of the difference in the perceived stigma count measures (i.e., the number of perceived stigma statements agreed to in the different environments) found that most participants (54%) reported perceived stigma on the same number of measures for each setting, 31% perceived stigma on fewer statements relating to the university setting (i.e., more stigma in the community setting) and 15% agreed to more of the perceived stigma statements relating to the university.

### **The association between preference of HIV testing location and perceived stigma**

Of the participants, 40% expressed a preference for HIV testing at the university clinic. Table 5 shows the logistic regression models used to assess the association between preference for HIV testing at the university clinic and differences in perceived stigma across settings. Bivariate analysis (Model 1) found that lower levels of perceived stigma in the university environment were positively associated with a preference for testing at the university clinic (OR: 1.41, 95%CI: 1.17–1.68,  $p < 0.01$ ). This result was substantively similar after adjustment for potential confounders (Model 2, aOR: 1.36, 95%CI: 1.10–1.66,  $p < 0.01$ ). The odds of individuals reporting a preference for HIV testing in the university environment were approximately twice as high among students who perceived less stigma in the university environment compared to other students (Model 4, aOR: 2.03, 95%CI: 1.20–3.42,  $p < 0.01$ ).

Sensitivity analysis using the independent variable created by taking the difference between the perceived stigma scores (0–16) across settings also found a positive relationship between preference for HIV testing at the university clinic and lower levels of perceived stigma within the university setting (aOR: 1.09,  $p < 0.05$ ).

### **Discussion**

HIV-related stigma and discrimination remain of great research and policy interest due to the detrimental impact these factors have on HIV prevention and treatment

efforts (Abdool Karim, 2011). In this study, we found that students in a South African tertiary education institution reported low levels of symbolic stigma (often referred to as stigmatising attitudes) and discrimination towards people living with HIV. Symbolic stigma was less common in our study sample than in other young adult populations in

South Africa (Maughan-Brown, 2010). In contrast, students reported high levels of perceived HIV-related stigma within both the university and home community environment. The disconnect between stigmatising attitudes reported by individuals and the perception they hold of stigma in their broader environment — in this case a university setting

**Table 3:** Perceived stigma in the university and community environment

		Overall % (n)	Males % (n)	Females % (n)
<b>University environment</b>				
People with HIV/AIDS in the university environment face rejection from their peers	Agree	18 (67)	18 (32)	18 (35)
	I don't know	30 (112)	29 (53)	30 (59)
People with HIV/AIDS in the university environment face verbal abuse or teasing	Agree	19 (71)	21 (37)	18 (34)
	I don't know	45 (165)	39 (70)	49 (95)
People who are suspected of having HIV/AIDS in the university environment lose respect	Agree	29 (106)	31 (56)	26 (50)
	I don't know	35 (128)	27 (48)	42 (80)
People with HIV in the university environment face physical abuse	Agree	8 (29)	6 (10)	10 (19)
	I don't know	46 (172)	39 (71)	52 (101)
Any perceived stigma		41 (150)	42 (75)	39 (75)
Mean perceived stigma score (0–16)		6.27	6.11	6.42
<b>Home/community environment</b>				
People with HIV/AIDS in my home community face rejection from their peers	Agree	33 (123)	34 (61)	32 (62)
	I don't know	23 (87)	22 (40)	24 (47)
People with HIV/AIDS in my home community face verbal abuse or teasing	Agree	26 (97)	26 (47)	26 (50)
	I don't know	25 (93)	25 (44)	26 (49)
People with HIV/AIDS in my home community who are suspected of having HIV/AIDS lose respect	Agree	38 (140)	41 (73)	34 (67)
	I don't know	20 (75)	21 (37)	20 (38)
People with HIV in my home community face physical abuse	Agree	9 (34)	8 (14)	10 (20)
	I don't know	31 (116)	34 (61)	29 (55)
Any perceived stigma		48 (174)	51 (91)	43 (83)
Mean perceived stigma score (0-16)		6.46	6.58	6.34

All percentages are rounded to the nearest whole number

The sample size varied slightly between variables ( $N = 369$  to  $375$ ) due to a small amount of missing data  
 $n$  refers to the size of the subset of the sample

**Table 4:** Differences between perceived stigma in the university and home community environment among the sample with data on all perceived stigma measures ( $N = 359$ )

		University environment % (n)	Home community environment % (n)	Difference	$p$ -value
People with HIV/AIDS in the...face rejection from their peers	Agree	18 (63)	33 (118)	-15	<0.01
	Don't know	30 (108)	23 (84)	7	0.04
People with HIV/AIDS in the...face verbal abuse or teasing	Agree	19 (70)	26 (94)	-7	0.03
	Don't know	44 (159)	25 (90)	19	<0.01
People with HIV/AIDS in the...who are suspected of having HIV/AIDS lose respect	Agree	28 (102)	38 (135)	-9	<0.01
	Don't know	35 (127)	20 (72)	15	<0.01
People with HIV in the...face physical abuse	Agree	8 (29)	9 (34)	-1	0.51
	Don't know	46 (166)	30 (109)	16	<0.01
<b>Combined measures</b>					
Any perceived stigma		40 (143)	46 (165)	-6	0.097
Perceived stigma on 2+ items		21 (76)	33 (120)	-12	<0.01
Mean perceived stigma score (0–16)		6.25	6.45	-0.20	0.88

$p$ -values were derived using standard differences in proportions tests

— is consistent with previous studies conducted in South Africa (Abdool Karim et al., 2008; Visser et al., 2009). These findings highlight how perceived stigma, through fears of what individuals perceive they may experience if diagnosed HIV-positive, may have a negative impact on the uptake of services, such as HIV testing, even in environments in which manifestations of stigma are rare. In other words, the negative public health impact resulting from perceived stigma may be disproportionate to the actual level of stigmatising attitudes.

Our results show that it was more common for students to perceive HIV-related stigma within the home community than the university environment. This is not surprising, as individuals would have more opportunities to hear about or witness instances of stigma in their home community as a result of the greater length of time spent in their home community and the wider social networks they are likely to have in that setting. Accordingly, as perceived stigma is a product of social learning (Scambler & Hopkins, 1986), the home community is an environment in which one would be more likely to expect perceived stigma to arise.

What is surprising is that less than a third of participants (31%) reported less perceived stigma in the university environment. In addition, levels of uncertainty regarding perceived stigma were significantly greater within the university environment. Given that few students reported symbolic stigma or discrimination themselves, and given that previous studies have shown a negative association between level of education and stigma (Hamra, Ross, Orrs, & D'Agostino, 2006; Maughan-Brown, 2006), we would have expected perceived stigma in the university environment to be considerably lower than perceived stigma in home-communities.

Results indicate a strong positive relationship between perceptions of stigma in different contexts. Most students who perceived stigma within the home community environment also reported perceived stigma within the university environment. As it is unlikely that similar levels of stigma are actually experienced by people living with HIV in these separate contexts, this finding raises the question of whether perceived stigma within a specific context is informed by factors relating to that context or whether individuals generalise perceived stigma from one environment to another (i.e., perceived stigma is not context specific). In other words, individuals entering a new environment may perceive that people living with

HIV in that setting face stigma because they believe that people living with HIV face stigma in another environment. The policy implications are potentially far reaching. The perception that people living with HIV experience stigmatisation in one sphere of life may deter the uptake of services, such as HIV testing, that are offered in alternative settings like the workplace, and places of study, as a result of the assumption that those environments must also be characterised by stigmatisation. Accordingly, further research into the origins of perceived stigma in different contexts is warranted.

Our results show that individual preferences for an HIV-testing location are likely influenced by the relative amount of perceived stigma in that location compared to perceived stigma in an alternative location. Establishing testing services in locations perceived as non-stigmatising, or less stigmatising than alternatives, may therefore benefit efforts to scale-up HIV testing and encourage repeat testing. Given that less than a third of students perceived lower levels of stigma within the university environment than their home environment, there is an opportunity for institutions such as this to reduce perceived stigma and create alternative spaces in which people can have an HIV test.

The results of our study should be considered along with the study limitations. Despite data collected via a self-administered questionnaire, our measures might have been influenced by social-desirability bias. We have no data on experiences and observations of stigma within either the home community or university environment and therefore cannot assess the accuracy of perceived stigma within these settings. We also do not have longitudinal data so we cannot ascertain whether perceived stigma in one setting preceded perceived stigma in the other, or the direction of the relationship between perceived stigma and preferences for HIV testing. Last, given the convenience sampling strategy used, it is unclear whether our results can be generalised to all students at the institution or to other student populations.

In conclusion, perceptions common among students that people living with HIV experience stigmatisation in both the home community environment and university are of great concern, given the negative impact of perceived stigma on HIV treatment and prevention efforts. In particular, as demand creation for HIV testing among young people has been especially challenging, perceived stigma among students may be a particular hindrance to efforts to achieve the UNAIDS 90-90-90 target. Results suggest that

**Table 5:** Logistic regression models of preference for HIV testing at the university clinic

	1	2	3	4
	OR (95%CI)	aOR (95%CI)	OR (95%CI)	aOR (95%CI)
Differential in perceived stigma count (–4 to +4) (higher values = less stigma at the university)	1.41*** (1.17–1.68)	1.36*** (1.10–1.66)		
Perceived stigma count lower at university (ref = higher at university/same)			2.12*** (1.34–3.36)	2.03*** (1.20–3.42)
Control variables included	No	Yes	No	Yes
Observations	354	332	354	332

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ . 95% confidence intervals in parentheses

Control variables included gender, age, population group, religious affiliation, home location (urban or rural), symbolic stigma (any = 1), discrimination (any = 1), HIV testing (ever = 1) and an HIV knowledge score (0–7; based on the sum of correct answers (true or false) to seven HIV knowledge questions)

HIV-testing services in environments perceived to be less stigmatising than home communities may provide preferred alternatives for HIV testing.

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