RELIGIOUS AFFILIATION AND UPTAKE OF HIV TESTING, TREATMENT AND VIRAL SUPPRESSION IN BOTSWANA

Mompati Mmalane[1], Jean Leidner[2], Nealia Khan[3], Molly Pretorius Holme[3], Baraedi W. Sento[4], Mary Grace Alwano[5], Joseph Makhema[1], Thandie Phindela[6], Kara Bennett[7], Kathleen E. Wirth[3,8]

[1]Botswana Harvard AIDS Institute Partnership, Gaborone, Botswana; [2]Goodtables Consulting, Norman, OK, USA; [3]Department of Immunology and Infectious Diseases, Harvard T.H. Chan School of Public Health, Boston, MA, USA; [4]Tebelopele HIV Testing and Counseling Center, Gaborone, Botswana; [5]Center for Disease Control and Prevention, Gaborone, Botswana; [6]Ministry of Health, Gaborone, Botswana; [7]Bennett Statistical Consulting Inc, Ballston Lake, NY, USA; [8]Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, MA, USA

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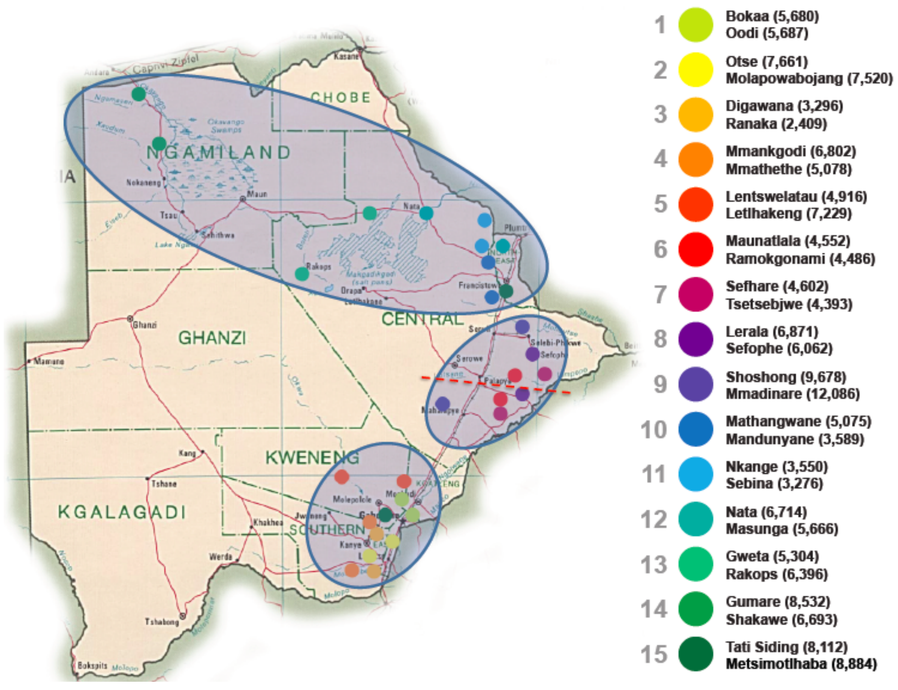
BACKGROUND AND OBJECTIVE

- HIV infection is a chronic condition associated with high levels of stigma and hopelessness which can lead to depression.
- HIV-infected individuals may seek religion and spirituality as a coping strategy.
- Attitudes toward testing for and treatment of HIV infection may differ across different religious denominations depending on their doctrines and teachings.
- Botswana, with the 3rd highest HIV prevalence in the world, has about 70% of its population estimated to belong to some religious group.
- Religious practices may influence HIV-related health-seeking behaviors like HIV testing, initiation of antiretroviral therapy (ART), and adherence to ART.
- **We sought to examine the relationship between religious affiliation, HIV prevalence and uptake of HIV testing, treatment and viral suppression.**

METHODS

- The Botswana Combination Prevention Project (BCPP) is a large, ongoing community-randomized HIV prevention trial in Botswana. A baseline household survey was administered from Oct 2013 to Nov 2015 in 30 peri-urban and rural communities with an average population of 6,000 residents **(Figure 1)**.

Figure 1. Map of 30 pair-matched communities participating in the BCPP



- All consenting Botswana citizens or spouses of citizens aged 16-64 years in a 20% random sample of all households in each community were enrolled.
- Self-reported religious affiliation and denomination was collected on all subjects. Among HIV-infected subjects, documentation of prior diagnosis and treatment status was obtained.
- Blood was taken for HIV testing (in the absence of prior documentation of a positive HIV status), and for viral load measurement, which was done on all patients who were HIV-infected, irrespective of prior knowledge of HIV status.
- Achievement of the combined UNAIDS 90-90-90 targets was defined as the proportion of all HIV-infected participants diagnosed and on treatment with an HIV-1 RNA <400 copies/mL.
- Modified Poisson generalized estimating equations were used to obtain univariable and multivariable-adjusted prevalence ratios (PR) and 95% confidence intervals (CI) for the associations between religious affiliation and (a) HIV status and (b) binary outcome indicating achievement of the combined UNAIDS 90-90-90 target.

RESULTS

Table 1. Baseline characteristics of N=12,602 participants with religious affiliation data

			Religious affiliation	
Characteristic (n with data)		**Total (N=12,602)**	**Non-religious (N=3,968)**	**Religious (N=8,634)**
Gender (n=12,602)	Male	4,557 (36%)	2,278 (57%)	2,279 (26%)
Geographical region (n=12,602)	Central	3,344 (27%)	1,182 (30%)	2,162 (25%)
	Northern	4,671 (37%)	1,369 (35%)	3,302 (38%)
	Southern	4,587 (36%)	1,417 (36%)	3,170 (37%)
Highest education level (n=12,527)	Non-formal	1,350 (11%)	452 (11%)	898 (11%)
	Primary	2,473 (20%)	668 (17%)	1,805 (21%)
	Junior Secondary	4,659 (37%)	1,631(41%)	3,028 (35%)
	Senior Secondary	2,192 (18%)	710 (18%)	1,482 (17%)
	Higher than Senior	1,853 (15%)	484 (12%)	1,369 (16%)
Age at interview (n=12,602)	16-19 years	1,372 (11%)	455 (12%)	917 (11%)
	20-29 years	3,839 (31%)	1,474 (37%)	2,365 (27%)
	30-39 years	3,053 (24%)	1,002 (25%)	2,051 (24%)
	40-49 years	2,017 (16%)	529 (13%)	1,488 (17%)
	50-59 years	1,712 (14%)	376 (10%)	1,336 (16%)
	60-64 years	609 (5%)	132 (3%)	477 (6%)
Currently not working (n=12,597)	Yes	8,748 (70%)	2,837 (72%)	5,911 (69%)
Marital status (n=12,598)	Single and never married	9,913 (79%)	3,508 (88%)	6,405 (74%)
	Married	2,080 (17%)	370 (9%)	1,710 (20%)
	Widowed, divorced, or separated	605 (5%)	90 (2%)	515 (6%)
Number partners, past 1 year (n=11,963)	0	2,601 (22%)	764 (20%)	1,837 (22%)
	1	6,485 (54%)	1,945 (51%)	4,540 (55%)
	2 or more	2,877 (24%)	1,071 (28%)	1,806 (22%)
Multiple and concurrent partners (n=9,361)	Yes	2,769 (30%)	1,033 (34%)	1,736 (27%)
Inconsistent condom use (n=9,076)	Yes	5,188 (57%)	1,638 (56%)	3,550 (58%)
Male and circumcised (n=4,556)	Yes	1,430 (31%)	647 (28%)	783 (34%)

RESULTS

- After adjustment for age and gender, any religious affiliation was significantly associated with lower HIV prevalence (PR: 0.88; 95%CI: 0.83-0.95) **(Table 2)**.

Table 2. Univariable and multivariable-adjusted associations between HIV infection status by religious affiliation and denomination.

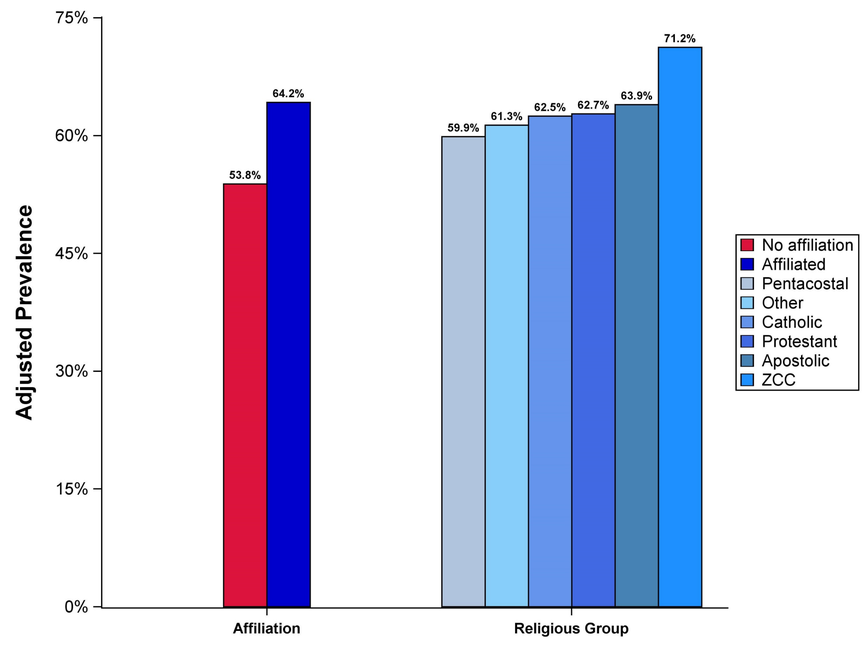
		Univariable			Multivariable-adjusted*		
Characteristic (n with data)		PR	(95% CI)	*P*	PR	(95% CI)	*P*
Religious affiliation	Non-religious	1	(ref)	0.01	1	(ref)	0.004
	Religious	**1.12**	**(1.03-1.2)**		**0.89**	**(0.83-0.95**	
Religious denomination	Non-religious	1	(ref)	0.002	1	(ref)	0.002
	Apostolic	**1.22**	**(1.11-1.34)**		0.96	(0.89-1.03)	
	Catholic	0.89	(0.75-1.05)		**0.69**	**(0.6-0.8)**	
	Protestant	1.00	(0.89-1.14)		**0.85**	**(0.75-0.96)**	
	Other	**0.81**	**(0.66-0.99)**		**0.68**	**(0.56-0.81)**	
	Pentecostal	0.91	(0.81-1.01)		**0.81**	**(0.74-0.89)**	
	Zion Christian Church (ZCC)	**1.29**	**(1.15-1.44)**		0.94	(0.85-1.03)	

- In univariable analyses, any religious affiliation was positively and significantly associated with achievement of the combined UNAIDS 90-90-90 target (P<0.001); the association remained significant after adjustment (PR: 1.08; 95%CI: 1.02-1.14) **(Table 3).**
- Similarly, in adjusted analyses affiliation with Apostolic, Pentecostal and Zion Christian Church religious denominations (as compared to no affiliation) was significantly associated with a 7%, 9%, and 13% higher absolute probability of meeting the combined UNAIDS 90-90-90 target.

Table 3. Univariable and multivariable-adjusted associations between achievement of combined UNAIDS 90-90-90 target by religious affiliation and denomination.

		Univariable			Multivariable-adjusted*		
Characteristic (n with data)		PR	(95% CI)	*P*	PR	(95% CI)	*P*
Religious affiliation	Non-religious	1	(ref)	0.001	1	(ref)	0.02
	Religious	**1.14**	**(1.08-1.2)**		**1.08**	**(1.02-1.14)**	
Religious denomination	Non-religious	1	(ref)	0.02	1	(ref)	0.08
	Apostolic	**1.11**	**(1.06-1.18)**		**1.07**	**(1.01-1.12)**	
	Catholic	1.1	(0.97-1.23)		1.01	(0.9-1.12)	
	Protestant	**1.14**	**(1.02-1.28)**		1.08	(0.96-1.21)	
	Other	1.10	(0.96-1.27)		1.04	(0.91-1.19)	
	Pentecostal	**1.13**	**(1.04-1.22)**		**1.09**	**(1.01-1.17)**	
	Zion Christian Church (ZCC)	**1.22**	**(1.13-1.31)**		**1.13**	**(1.05-1.21)**	

Figure 2. Adjusted prevalence of achievement of combined UNAIDS 90-90-90 target by religious affiliation and denomination.



CONCLUSIONS

- Religious affiliation was significantly associated with increased uptake of HIV testing, treatment and viral suppression in Botswana.
- Compared with non-religious HIV-infected participants, members of Apostolic, Pentecostal, and ZCC religious denominations were positively associated with higher probability of meeting the combined UNAIDS 90-90-90 target.
- More work is needed to understand facilitators for and barriers to uptake of HIV prevention interventions across different religious denominations.
- Botswana should consider leveraging on the high prevalence of religiosity among its citizens to accelerate progress to reach the UNAIDS 90-90-90 targets by 2020.

LIMITATIONS

- Assessment of religiosity was coarse; detailed information on history and frequency of attendance and participation in religious activities was not available.
- Although we adjusted for age and gender, confounding due to unmeasured factors could bias our findings.
- Information on both religious affiliation and HIV status, treatment, and viral suppression was obtained at the same time-point. Therefore, we are unable to confirm whether religious affiliation was established prior to or after HIV infection (i.e. reverse causation).

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- The study is registered at ClinicalTrials.gov (NCT01965470).