

**Proposed title:** HIV-related stigma and uptake of HIV self-testing in Malawi and Zambia.

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**Abstract**(502 (including headers) /500)

## **Background**

Individuals' perceptions of HIV stigma may act as a barrier to accessing HIV testing, prevention, and care, both because of fears of abuse following an HIV diagnosis and because health care workers (HCW) may seem indiscreet or disrespectful. We investigated associations between perceived stigma and use of standard HIV testing services (HTS) and HIV self-testing (HIVST) among HIV-negative community members in rural Malawi and rural and urban Zambia during 2016-2017.

## **Methods**

In a secondary analysis of data collected in two cluster-randomized trials, adults (age  $\geq 16$ ) were interviewed following 12 months of community-based HIVST distribution. A 10-item scale validated for the PopART study in Zambia and South Africa was used to measure stigma as perceived by HIV-negative respondents in the community. We analysed the full scale ("any stigma") and two subscales of perceived verbal/physical abuse of persons living with HIV (PLHIV) ("perceived abuse") (3 items) and perceived gossip/disclosure of HIV status by health care workers ("HCW stigma") (2 items). Internal reliability was evaluated using Cronbach's alpha, and items were summed to obtain a final score. Associations between sociodemographic characteristics and each stigma score were estimated using Poisson models. HIV testing history was measured using self-report, and compared respondents testing using HIVST, using standard HIV testing services (HTS), and those not testing in the past 12 months. Associations between stigma and HTS and/or HIVST uptake were estimated using multinomial logistic regression in country-stratified models. All models were adjusted for clustered design, respondent age, sex, and education.

## **Results**

Responses from 641 Malawian (40.4% men) and 528 Zambian (42.3% men) participants showed acceptable internal consistency of the "any stigma" score ( $\alpha=0.70$  in Malawi, 0.78 in Zambia). In Malawi and Zambia, 26.8% (172/641) and 39.2% (202/515) of respondents had not tested in the past 12 months. Self-testing was more common in Malawi (37.9%, 243/641) than Zambia (11.2%, 58/515). All measures of stigma were higher among Zambian versus Malawian participants ("any stigma": adjusted risk ratio [aRR] 1.24, 95% CI: 1.31, 1.35; "perceived abuse": aRR 1.15, 95% CI 1.02, 1.30; "HCW stigma": 1.49; 95% CI: 1.28, 1.74), but did not differ by age, sex, or education. The "perceived abuse" score was negatively associated with using HTS in Zambia (aRR 0.68, 95% CI 0.50, 0.93), but not with using HIVST (aRR 0.94, 95% CI 0.66, 1.36). In Malawi, uptake of both HTS and HIVST was

positively associated with higher “any stigma” score (HIVST aRR 1.12, 95% CI 1.04, 1.20; HTS aRR 1.07, 95% CI 1.01,1.13). No other independent associations between stigma scores and uptake of either HIVST or HTS were identified.

## **Discussion**

In Zambia higher “perceived abuse” score was associated with reduced HTS use, but not with HIVST use, suggesting that HIVST in this context may appeal to persons who are afraid of being stigmatised by utilizing standard services. Findings from Malawi are counterintuitive but may suggest that stigma is not an important barrier to testing here when services are available. These disparate results highlight the importance of regional and national context in understanding the role of stigma in shaping individual behaviour.

## **Works cited**

MN note: tables are FYI and will not be submitted

Table 1. Measure overview

Measure	Malawi (N=641)								Zambia (N=528)							
	Strongly Agree		Agree		Disagree		Strongly disagree		Strongly Agree		Agree		Disagree		Strongly disagree	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
<b>Health care worker behaviours</b>																
Health workers sometimes talk badly about people living with or thought to be living with HIV	100	15.7	206	32.4	184	29	145	22.8	37	7.4	145	28.8	215	42.7	106	21.1
Health workers sometimes disclose that other people are HIV positive without their permission	73	11.5	168	26.5	217	34.2	177	27.9	35	7.0	129	25.7	223	44.4	292	25.7
<b>Physical or verbal abuse</b>																
People sometimes talk badly about people living with or thought to be living with HIV	224	35.1	311	48.7	75	11.8	28	4.4	97	18.9	254	49.4	117	22.8	46	8.9
People living with or thought to be living with HIV are verbally insulted, harassed, and/or threatened	124	19.5	228	35.8	167	26.3	117	18.4	40	7.9	116	22.8	47.2	407	113	22.2
People living with or thought to be living with HIV are sometimes physically assaulted	53	8.3	169	26.6	228	35.8	186	29.2	27	5.2	84	16.3	253	49	152	29.5
<b>Other items</b>																
People are hesitant to take an HIV test due to fear of other people's reaction if the test result is positive for HIV	220	34.6	298	46.9	79	12.4	38	6	119	23.1	249	48.3	114	22.1	34	6.6
People living with or thought to be living with HIV lose respect or standing	118	18.6	290	45.7	161	25.4	66	10.4	40	8.0	155	30.8	216	42.9	92	18.3
I would be ashamed if someone in my family had HIV	41	6.4	107	16.8	238	37.3	252	39.5	27	5.2	84	16.3	253	49	152	29.5
I would not like to sit close to someone living with HIV, for example on public transport, at church, or in a waiting room	10	1.6	107	16.8	266	41.6	341	53.4	21	4.1	46	9.1	284	55.9	157	30.9
People sometimes disclose that other people are HIV positive without their permission	171	27	286	45.1	141	22.2	36	5.7	63	12.5	244	48.2	121	23.9	78	15.4



Country - Zambia	1.23	0.000	1.24	0.000	1.16	0.008	1.15	0.019	1.45	0.000	1.49	0.000
	(1.13, 1.35)		(1.13, 1.35)		(1.04, 1.29)		(1.02, 1.30)		(1.24, 1.70)		(1.28, 1.74)	
Male sex	-	-	1.00	0.985	-	-	0.98	0.773	-	-	1.03	0.595
	-		(0.95, 1.06)		-		(0.88, 1.10)		-		(0.93, 1.13)	
Age in years (grouped)				<b>0.215</b>				<b>0.841</b>				<b>0.703</b>
20-24	-	-	1.03	0.489	-	-	1.09	0.388	-	-	0.95	0.537
	-		(0.94, 1.13)		-		(0.90, 1.32)		-		(0.80, 1.12)	
25-29	-	-	0.99	0.790	-	-	0.97	0.772	-	-	0.92	0.400
	-		(0.89, 1.09)		-		(0.79, 1.20)		-		(0.77, 1.11)	
30-39	-	-	1.08	0.097	-	-	1.03	0.748	-	-	1.05	0.554
	-		(0.99, 1.19)		-		(0.85, 1.25)		-		(0.89, 1.25)	
40-49	-	-	1.05	0.396	-	-	1.06	0.594	-	-	0.96	0.672
	-		(0.94, 1.16)		-		(0.85, 1.31)		-		(0.79, 1.16)	
50-59	-	-	1.09	0.189	-	-	1.07	0.612	-	-	1.00	0.992
	-		(0.96, 1.23)		-		(0.82, 1.39)		-		(0.79, 1.26)	
60+	-	-	1.11	0.071	-	-	1.13	0.332	-	-	1.04	0.728
	-		(0.99, 1.25)		-		(0.88, 1.44)		-		(0.84, 1.29)	
Educational attainment				<b>0.818</b>				<b>0.935</b>				<b>0.317</b>
Primary incomplete or complete	-	-	0.96	0.407	-	-	0.98	0.813	-	-	0.89	0.159
	-		(0.88, 1.06)		-		(0.81, 1.18)		-		(0.75, 1.05)	
Secondary incomplete	-	-	0.98	0.730	-	-	1.02	0.840	-	-	0.82	0.062
	-		(0.88, 1.10)		-		(0.82, 1.28)		-		(0.67, 1.01)	
Secondary complete or higher	-	-	0.98	0.743	-	-	1.00	0.973	-	-	0.88	0.308
	-		(0.86, 1.11)		-		(0.76, 1.30)		-		(0.70, 1.12)	

(Bold numbers are results from multivariate Wald tests of all parameters in the construct (age/education).)

Table 4. Stigma models

	Malawi				Zambia				Country interaction p-value	
	Self-tested v. did not test		Used HTS v. did not test		Self-tested v. did not test		Used HTS v. did not test		Self-tested v. did not test	Used HTS v. did not test
	RR (95% CI)	p-value	RR (95% CI)	p-value	RR (95% CI)	p-value	RR (95% CI)	p-value	p-value	p-value
Any stigma	1.12 (1.04, 1.20)	0.003	1.07 (1.01, 1.13)	0.031	0.87 (0.75, 1.02)	0.078	0.91 (0.79, 1.04)	0.173	0.003	0.023
HCW	1.10 (0.85, 1.42)	0.450	1.13 (0.91, 1.41)	0.276	0.78 (0.58, 1.06)	0.109	1.11 (0.83, 1.50)	0.484	0.073	0.883
Abuse	1.16 (0.94, 1.43)	0.156	1.00 (0.85, 1.18)	0.967	0.94 (0.66, 1.36)	0.754	0.68 (0.50, 0.93)	0.017	0.100	0.027

All estimates additionally adjusted for age (15-19, 20-24, 25-29, 30-39, 40-49, 50-59, 60+), gender, and educational attainment (no formal education, primary incomplete or complete, secondary incomplete, secondary complete or higher)

Country interaction p-value obtained by using two-country pooled dataset - other values from country-stratified analysis

Table 5.

	Malawi								Zambia							
	Crude				Adjusted				Crude				Adjusted			
	Self-tested v. did not test		Used HTS v. did not test		Self-tested v. did not test		Used HTS v. did not test		Self-tested v. did not test		Used HTS v. did not test		Self-tested v. did not test		Used HTS v. did not test	
10-item stigma measure	1.10	0.018	1.05	0.048	1.12	0.003	1.07	0.031	0.88	0.080	0.90	0.130	0.87	0.078	0.91	0.173
	(1.02, 1.19)		(1.00, 3.91)		(1.04, 1.20)		(1.01, 1.13)		(0.75, 1.02)		(0.79, 4.46)		(0.75, 1.02)		(0.79, 1.04)	
Male sex					0.90	0.649	0.47	0.026					0.36	0.037	0.40	0.000
					(0.57, 1.43)		(0.24, 0.91)						(0.14, 0.94)		(0.24, 0.67)	
Age in years (grouped)					2.42	0.052	2.11	0.129					1.32	0.419	1.25	0.539
20-24					(0.99, 5.89)		(0.80, 5.55)						(0.67, 2.57)		(0.61, 2.57)	
25-29					1.59	0.391	1.71	0.315					1.35	0.568	2.28	0.001
					(0.55, 4.57)		(0.60, 4.88)						(0.48, 3.77)		(1.40, 3.72)	
30-39					2.19	0.105	1.94	0.184					2.29	0.118	2.33	0.012
					(0.85, 5.64)		(0.73, 5.15)						(0.81, 6.50)		(1.21, 4.50)	
40-49					1.23	0.721	1.13	0.845					2.02	0.083	2.00	0.120
					(0.39, 3.91)		(0.34, 3.70)						(0.91, 4.46)		(0.83, 4.82)	
50-59					1.42	0.478	0.69	0.587					0.55	0.487	1.05	0.892
					(0.54, 3.72)		(0.18, 2.64)						(0.11, 2.92)		(0.51, 2.14)	
60+					0.34	0.030	0.61	0.457					0.23	0.057	0.59	0.341
					(0.13, 0.90)		(0.16, 2.27)						(0.05, 1.05)		(0.20, 1.73)	
Educational attainment																
Primary incomplete or complete					1.65	0.065	2.03	0.036					1.58	0.440	4.66	0.000
					(0.97, 2.79)		(1.05, 3.94)						(0.50, 5.01)		(2.32, 9.37)	
Secondary incomplete					1.78	0.251	2.15	0.057					1.64	0.577	4.24	0.026
					(0.67, 4.73)		(0.98, 4.72)						(0.29, 9.41)		(1.19, 15.09)	
Secondary complete or higher					1.78	0.251	2.15	0.057					1.64	0.577	4.24	0.026
					(0.67, 4.73)		(0.98, 4.72)						(0.29, 9.41)		(1.19, 15.09)	

Note that multivariate tests are not included but would be similar to those presented in table 2 (which present crude multivariate tests for significance of age/education).