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Fighting stigma, promoting care: A study on the use of occupationally-based HIV services in the Free State Province of South Africa

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Fighting stigma, promoting care: A study on the use of occupationally-based HIV services in the Free State Province of South Africa

Fear of breaches in confidentiality and HIV-related stigma in the workplace have been shown to be primary concerns and potential barriers to uptake of HIV testing and treatment by health care workers (HCWs) at the Occupational Health Unit (OHU). In a context of human resource shortages, it is essential to investigate potential ways of reducing HIV-related stigma and promoting confidentiality in the workplace. Using Structural Equation Modelling (SEM), baseline data of the 'HIV and TB Stigma among Health Care Workers Study' (HaTSaH Study) for 818 respondents has been analysed to investigate (1) whether bottom-up stigma-reduction activities already occur; and (2) whether such grassroots actions can reduce the fear of breaches in confidentiality and HIV-related stigma – and thus indirectly stimulate the uptake of HIV services at the OHU.

Results (aim 1) illustrate the occurrence of existing activities aiming to reduce HIV-related stigma, such as HCWs giving extra support to HIV positive co-workers and educating co-workers who stigmatize HIV. Furthermore, results of the SEM analysis (aim 2) show that the *Fighting-stigma factor* has a significant negative effect on *HIV-related stigma* and a significant positive effect on *Confidentiality*. Results show that the latent *fighting-stigma factor* has a significant positive total indirect effect on the use of HIV testing, CD4 cell count and HIV-treatment at the OHU.

The findings reveal that the fear of breaches in confidentiality and HIV-related stigma can be potential barriers to the uptake of occupationally-based HIV services. However, results also show that a bottom-up climate of fighting HIV-related stigma can stimulate confidentiality in the workplace and diminish the negative effect of HIV-related stigma – resulting in an overall positive effect on the reported willingness to access occupationally-based HIV services.

Keywords: HIV-related stigma; Confidentiality; Stigma reduction; Health care workers; Occupational health unit

Introduction

South Africa's public sector antiretroviral treatment (ART) program has become the largest and most costly public health program ever introduced in the country, with 3.9 million people currently on ART out of the 7.1 million living with HIV/AIDS (PLWHA) in South Africa (Mayosi & Benatar, 2014; UNAIDS, 2017). Providing comprehensive care for the growing number of PLWHA, and PLWHA co-infected with tuberculosis (TB), puts pressure on an already stretched health care system (Brust et al., 2012; Karim, Karim, Friedland, Lalloo, & El Sadr, 2004; van Rensburg, 2014). In the words of Mwai et al. (2013: p.1): "efforts to scale up HIV treatment and care in sub-Saharan Africa over the past decade, while successful, have exposed pre-existing weaknesses of health systems in the region, in particular the lack of health workers to provide ART". To provide adequate care to all PLWHA, South Africa requires at least three times its current healthcare workforce (Mayosi & Benatar, 2014).

The HIV epidemic, exacerbated further by high TB co-infection rates, imposes a double burden on healthcare human resources (Siegel et al., 2015; van Rensburg, 2014). On the one hand, public health facilities are over-crowded, dealing with large patient numbers in resource-constrained circumstances (Namakhoma et al., 2010; Siegel et al., 2015). On the other hand, the HIV epidemic equally affects the healthcare workforce (Uebel, Nash, & Avalos, 2007). Estimates of the HIV prevalence among South African healthcare workers (HCWs) range from 11.5% to 20.0% (Adamsi, Ehrlich, Ismaili, Quaili, & Jeebhay, 2013). This high level of HIV is one of the drivers of absenteeism, sick leave and attrition among HCWs (Siegel et al., 2015). Delaying or avoiding seeking care by HIV-positive HCWs causes increased morbidity and mortality, and puts further strain on an overburdened health system (Nyblade, Stangl, Weiss, & Ashburn, 2009). In this context, health authorities "acknowledge that HIV, in addition to TB, among HCWs is an occupational health issue that needs to be managed in the workplace" (Siegel et al., 2015: p. 996).

The size and scale of the HIV epidemic compelled health system researchers and policy makers to find solutions to HIV-related challenges for HCWs (International Labour Organisation, 2010). As outlined in the joint WHO-ILO-UNAIDS policy guidelines “the health sector is responsible for the prevention, diagnosis, treatment and care of illness and can contribute to reducing stigma and discrimination in the context of health services” (International Labour Organisation, 2010: p. 1). In response to the workforce problems, HCWs in South Africa are encouraged to seek HIV testing and treatment in their own health facility using the Occupational Health Unit (OHU).

However, HCWs do not make optimal use of occupationally-based HIV services (Buregyeya et al., 2012; Namakhoma et al., 2010). A review study by Nyblade et al. (2009: p. 2) indicated that HIV-related stigma in the workplace formed a key barrier to care-seeking behaviour, representing “a major ‘cost’ for both individuals and public health”. Furthermore, fear of breaches in confidentiality has been found to be another primary concern and key barrier to uptake of occupationally-based services for HIV prevention and treatment (Khan et al., 2015; Namakhoma et al., 2010; Nyblade et al., 2009; Siegel et al., 2015; Uebel et al., 2007). For instance, in a study conducted in Ethiopia, 8 out every 10 HCWs indicated that the main reason to opt for HIV self-testing was the need for confidentiality (Kebede, Abate, & Mekonnen, 2013).

This widespread empirical evidence suggests that interventions to reduce stigma and ensure confidentiality in the workplace are essential to ensure uptake of comprehensive HIV care and testing (Buregyeya et al., 2012). Although considerable research has been devoted to stigma-reducing interventions focussing on PLWHA, less attention has been paid to HIV and TB stigma reduction interventions focussing on HCWs who are on the front line of the HIV epidemic (Namakhoma et al., 2010; Nyblade et al., 2009; Siegel et al., 2015). Against this backdrop, it is essential to investigate potential ways to reduce HIV-related stigma and ensure confidentiality in the workplace. The HIV and TB Stigma among Health Care Workers Study

(henceforth called the *HaTSaH Study*) was designed to encourage a health-enabling labour environment in which HCWs affected by HIV and/or TB are optimally treated and supported. To establish a sound basis for this intervention study, an examination of which actions already exist with regard to stigma reduction in the workplace was needed. More specifically, this analysis aims to investigate (1) whether bottom-up stigma-reduction activities already occur; and (2) whether such grassroots actions can reduce the fear of breaches in confidentiality and HIV-related stigma – and thus indirectly stimulate the uptake of HIV services at the OHU.

Methods

Data

This study is part of a bigger research project – the *HaTSaH Study*. This project aims to (1) scientifically assess the extent and potential sources of HIV- and TB-related stigma among all HCWs; and (2) develop and test evidence-based stigma-reduction interventions in randomly selected public hospitals. HCWs are defined in this study as all people working in all departments and in all jobs or professions at the hospital. The baseline data collection (completed in 2016) includes a random selection of HCWs working in 8 public hospitals across the Free State Province of South Africa. However, for this study, 818 respondents from only 6 hospitals are included, as 2 out of the 8 hospitals do not have functional Occupational Health Units.

Ethics

The *HaTSaH Study* was approved by the Ethics Committee of the Faculty of Health Sciences of the University of the Free State [ECUFS 55/2015] and the Ethics Board of the Social and Human Sciences at the University of Antwerp [SHW_15_28_04]. After obtaining written informed consent from all of the participants, trained field workers provided the participants with the standard questionnaires that were completed in a self-administered process.

Measures

The outcome variable of our model, the reported willingness to use of the Occupational Health Unit for HIV services was measured by means of three questions: Would you use the Occupational Health Unit (Sick Bay) for each of these HIV services (0: no; 1: yes): (1) HIV testing: conducting an HIV test; (2) CD4 cell counts: measuring the weakening of the immune system and advancement in the progression of HIV disease; and (3) HIV treatment: accessing antiretroviral treatment (ART).

The *Others' External HIV Stigma (HIVOEXT)* was previously tested in this sample and reported by Wouters et al. (2017). This Stigma scale measures HIV-related stigma perceptions, attitudes and behaviours that respondents witness being enacted, or perceive as existing, among other HCWs (also referred to as 'colleagues') in the hospital. More specifically, *HIVOEXT* was assessed using four items on a four-point Likert scale (1: strongly disagree; 2: disagree; 3: agree; 4: strongly agree), as presented in Table 1. Confirmatory factor analysis was used to examine the latent structure of the *Others' External HIV stigma (HIVOEXT)* scale. In order to evaluate whether the resulting parameter estimates were good measures of their latent constructs, we included items which had factor loadings above the 0.40 threshold (Brown, 2006). All of the factor loadings were above 0.60, ranging from 0.672 to 0.704. The composite reliability of the scales was calculated following the method described by Hatcher (1994). The composite reliability of this *HIVOEXT* factor was found to be above the 0.70 threshold recommended (0.79) (Hatcher, 1994).

Table 1. Descriptive statistics of HIVOEXT, Confidentiality and Fighting-stigma

Variable	n	Descriptives (% strongly agree and agree)
HIVOEXT		
Some of my co-workers in this hospital look down on healthcare workers (HCW) who they think may be HIV-infected;	818	20,4%
There are HCW who make negative remarks about the health of	818	27,5%

co-workers who are involved in HIV care and treatment		
Some HCW who are suspected of having HIV get rejected by others in the workplace;	818	18,7%
Other healthcare workers in this hospital are afraid of catching HIV from colleagues who care for HIV-positive patients	818	23%
Confidentiality		
Do you think that confidentiality about HIV is maintained in your Occupational Health Unit (Sick Bay)?	818	75,7%
Do you think that confidentiality about TB is maintained in your Occupational Health Unit (Sick Bay)?	818	75,9%
Do you think that confidentiality about general health related issues is maintained in your Occupational Health Unit (Sick Bay)?	818	70,9%
Fighting-stigma		
Some healthcare workers in this hospital are known to give extra support to colleagues with HIV	817	81,9%
Some healthcare workers in this hospital educate co-workers who stigmatize people living with HIV;	816	75,0%
Some healthcare workers in this hospital are doing something to stop stigma in the workplace.	818	67,4%

Table 1 shows the three items of the *Confidentiality scale* measured on a three-point Likert scale (1: no; 2: not sure; 3: yes). Inspection of the loadings showed that all were above the 0.40 threshold recommended (Brown, 2006), ranging from 0.837 to 0.867. The composite reliability of the factor was also found to be above the 0.70 threshold recommended (Hatcher, 1994), with a value of 0.88.

The *Fighting-stigma scale* consisted of three items (Table 1) on a four-point Likert scale (1: strongly disagree; 2: disagree; 3: agree; 4: strongly agree). All factor loadings were highly significant, and all loaded sufficiently on the factor (standardised factor loadings ranging from 0.576 to 0.717). The composite reliability of the *Fighting-stigma scale* was borderline, with a value of 0.66.

Furthermore, the analysis includes a series of socio-demographic characteristics (i.e., age; sex; education level). The analysis also controlled for the number of years a HCW had been working in the hospital; whether or not they were working directly with patients; whether they had medical insurance; which hospital they were working in; and whether they

knew of co-workers who were HIV positive. In addition, the study included participants' HIV-related knowledge, assessed via 10 questions (Buregyeya et al., 2012; Khan et al., 2015; Namakhoma et al., 2010).

Analysis

To investigate the first research aim, we analysed the descriptive statistics using SPSS, version 24. For the second research aim, Structural Equation Modelling (SEM) was performed using a robust weighted least squares estimator (WLSMV) with Mplus, version 7. Pairwise deletion has been used to handle missing data. Using the aforementioned control variables, the first structural model measured the influence of the latent *Confidentiality* factor and *Others' External HIV stigma (HIVOEXT)* factor on the reported willingness to use of occupationally-based HIV services. In a second step, the *Fighting-stigma latent factor* was introduced to the model. To analyse the interrelationship between the three latent factors involved in the analysis (*Fighting-stigma*, *Others' External HIV stigma (HIVOEXT)*, and *Confidentiality*), an indirect effect was estimated in this second structural model. The adequacy of the models was evaluated based on Hu and Bentler's cut-off criteria (1999), in which two of the following three criteria must be met for a satisfactory global model fit to be attained: Comparative Fit Index (CFI) $\geq .95$, Tucker Lewis Index (TLI) $\geq .95$, and Root Mean Square Error of Approximation (RMSEA) $\leq .06$ (Hu & Bentler, 1999).

Results

Descriptive results

The sample characteristics (Table 2) show that the vast majority of the respondents were female with a mean age of 43.68 years (SD: 9.94). Most respondents obtained matric as their highest level of education. On average, the respondents had worked 11.78 years (SD: 9.71) in the hospital. About half of the HCWs included in the study worked directly with patients. A

minority reported knowing the HIV status of their colleagues. Seven out of ten HCWs are covered by medical insurance. Respondents scored on average 6.96 (SD: 1.65) out of ten on the HIV knowledge questions. Table 2 further explores whether respondents would use the OHU for various HIV services. Three out of four respondents (75.4%) reported that they would use the OHU for testing. For CD4 cell counts and ART 68.2% and 65.9 % answered in the affirmative, respectively.

Table 2. Descriptive sample statistics

Variable		N	Descriptive statistic
Sex		816	
	Female		72,4%
	Male		27,6%
Age		811	43,68 (mean), 9,94 (SD)
Education Level		818	
	No education		0,5%
	Primary		5,3%
	Secondary		17,8%
	Matric		34,8%
	Diploma		26,5%
	Degree		15,1%
Years working at the hospital		818	11,78 (mean), 9,71 (SD)
HIV knowledge (0-10)		818	6,96 (mean), 1,65 (SD)
Working directly with patients		817	50,8%
Medical insurance		815	70,3%
Know HIV status colleague		796	4,6%
Would make use of HIV testing at OHU		818	75,4%
Would make use of CD4 count testing at OHU		818	68,2%
Would make use of accessing HIV treatment at OHU		818	65,9%

The respondents indicated several major reasons why they would not use the OHU. About half of them had issues with confidentiality (53,2%). They did not want colleagues at the OHU to know and did not trust them. About one in five indicated that the quality of care and services were the reason for non-usage of the OHU (19,5%). The third most important reason (15.2%)

was concern about stigma. 7.4 % preferred to choose their own facility, General Practitioner (GP) or nearest clinic – often when the respondent was covered by medical insurance.

Table 1 gives an overview of the descriptive statistics of the items of the three latent factors involved in this analysis: *HIVOEXT*, *Confidentiality* and *Fighting-stigma*. Results show that 81.9% of the HCWs agree that some co-workers are known to give extra support to HIV positive co-workers; 75 % agreed that some educate co-workers who stigmatise HIV; and 67.4% responded positively that some co-workers do something to stop HIV-related stigma in the workplace. Those who responded positively to the latter question were asked to indicate which specific actions are taken by HCWs to stop stigma in their workplace. Multiple answers were possible and are shown in Table 3.

Table 3. Action taken by HCWs to stop stigma in the workplace

Action taken by HCWs to stop stigma in the workplace	Descriptive statistics
Stigmatization, HIV education and awareness campaigns	40,2%
Counselling, guidance and support groups	19,4%
Encouraging HIV prevention behaviour, testing and treatment	10,6%
Actions to maintain confidentiality and stop gossip	7,7%
In-service training	5,3%
Equal treatment of positive and negative patients	5,3%
Disclosure support	4,7%
Breaking down social barriers among HCWs and positive people	3,8%
Distributing and encouraging the use of condoms and TB masks	1,9%
Motivational talks from people living with HIV/AIDS	1,0%
Extra sick leave for HIV/TB patients	0,1%

SEM results

As indicated by the CFI (0.966), TLI (0.937) and RMSEA (0.060), an acceptable model fit was found for the first SEM model. As shown in Table 4, the latent *Confidentiality factor* was positively associated with the reported willingness to make use of HIV testing (Test HIV), measurement of the CD4 cells (CD4 cell count) and accessing ART (Treat HIV) at the OHU. Furthermore, *Others' external HIV stigma (HIVOEXT)* was negatively associated with the reported willingness to use of all three OHU services, indicating that stigma inhibits the uptake

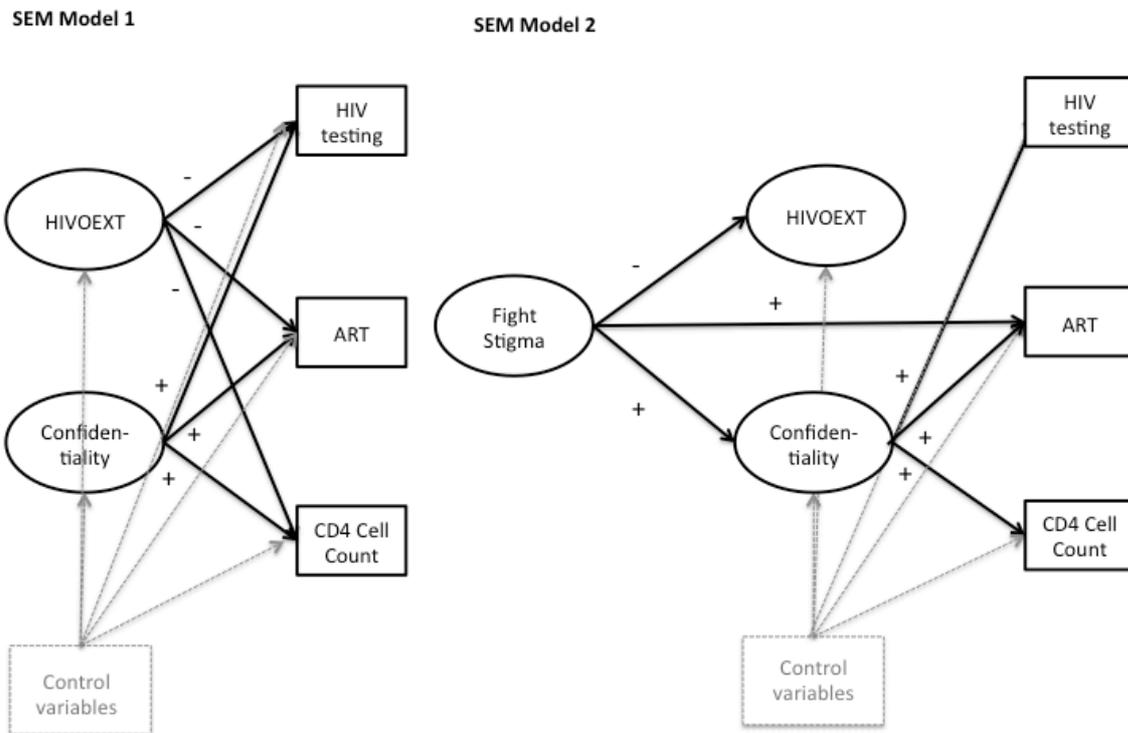
of HIV services at the health facility. When we examine the control variables more closely, results show that the fact that a HCW knew a colleague who is HIV-positive is positively related to *HIVOEXT*. Furthermore, sex is negatively associated with reported willingness to access occupationally-based HIV services; indicating that female HCWs are less inclined to go to the OHU for testing and treatment. HIV knowledge stimulates willingness to access testing at the OHU. Working directly with patients has been shown to be positively associated with both confidentiality and *HIVOEXT*. Furthermore, this control variable had a positive significant effect on the reported willingness to use all three types of OHU services.

Table 4: First SEM model measuring the influence of Confidentiality and Others' External HIV stigma on the use of Occupational Health Services for HIV (n = 784)

	Confiden- tiality	HIVOEXT	Test HIV	CD4 cell Count	Treat HIV
Confidentiality			0,335***	0,296***	0,298***
HIVOEXT			- 0,160**	-0,158**	-0,164***
Sex	-0,034	-0,052	-0,292**	-0,303**	-0,277**
Age	0,043	0,030	0,083	0,033	0,078
Education level	0,024	-0,024	-0,101	-0,066	-0,064
Years working at the hospital	0,017	0,010	-0,125	-0,012	-0,042
HIV knowledge	-0,007	-0,069	0,132*	0,094	0,087
Working directly with patients	0,215*	0,208*	0,359**	0,337**	0,268*
Medical insurance	-0,017	-0,112	-0,148	-0,057	-0,033
Know HIV status colleague	0,122	0,629***	-0,143	-0,161	-0,238
Hospital 1	0,338**	-0,254*	-0,004	0,014	0,068
Hospital 2	0,009	-0,102	-0,042	-0,028	0,020
Hospital 3	-0,038	-0,120	-0,120	0,090	0,041
Hospital 4	-0,168	-0,263	-0,063	-0,004	0,168
Hospital 5	0,047	-0,542*	-0,310	-0,198	-0,110
R²	3,7%	7,2%	24,5%	18,7%	18,1%

*p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001

Figure 1. Introducing the latent Fighting-stigma factor in the second SEM model



The second SEM model displayed a good fit to the data (RMSEA = 0.039, CFI = 0.977 and TLI = 0.964). In this model, the *Fighting-stigma factor* has a significant negative effect on *others' external stigma* and a significant positive effect on *Confidentiality*, as presented in Table 5. When introducing the latent *Fighting-stigma factor* in this second model, the significant negative effect of *Others' external stigma (HIVOEXT)* on the reported willingness to use services at the OHU disappears. The positive effect of *Confidentiality* on reported willingness to access OHU services remains in this second SEM model – as shown in Figure 1. Estimated with an indirect effect, the total effect of the latent *Fighting-stigma factor* on the reported willingness to use the OHU was 0.237 (p=0.000) for HIV testing services; 0.243 (p= 0.000) for CD4 cell count services; and 0.274 (p= 0.000) for treatment services. The effect of the control variables as displayed in Table 5 remains largely similar to the results of the first SEM model.

Table 5: Second SEM model measuring the influence of Fighting-stigma mediated by Confidentiality and Others' External HIV stigma on the use of Occupational Health Services for HIV (n = 784)

	Confiden- tiality	HIVOEXT	Test HIV	CD4 cell Count	Treat HIV
Fighting- Stigma	0,426***	-0,265***	0,089	0,096	0,156*
Confidentiality			0,284***	0,232***	0,218***
HIVOEXT			-0,100	-0,118	-0,093
Sex	-0,034	-0,048	-0,290**	-0,301**	-0,276**
Age	0,043	0,030	0,083	0,034	0,079
Education level	0,024	-0,023	-0,098	-0,063	-0,060
Years working at the hospital	0,017	0,009	-0,125	-0,011	-0,042
HIV knowledge	-0,007	-0,068	0,136**	0,098*	0,092
Working directly with patients	0,215*	0,209*	0,357**	0,338**	0,270*
Medical insurance	-0,017	-0,112	-0,142	-0,051	-0,027
Know HIV status colleague	0,122	0,633***	-0,174	-0,192	-0,272
Hospital 1	0,338**	-0,253*	0,029	0,051	0,113
Hospital 2	0,009	-0,101	-0,035	-0,021	0,029
Hospital 3	-0,038	-0,118	-0,114	0,095	0,047
Hospital 4	-0,167	-0,259	-0,056	0,002	0,173
Hospital 5	0,047	-0,539	-0,274	-0,160	-0,067
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R ²	21,9%	14,2%	24,1%	18,8%	19,0%

*p ≤0.05, **p≤0.01, ***p≤0.001

Discussion

This article aimed to investigate (1) whether bottom-up stigma-reduction activities already occur; and (2) whether such grassroots actions can reduce the fear of breaches in confidentiality and HIV-related stigma – and thus indirectly stimulate the uptake of HIV services at the OHU.

With regard to the first aim, descriptive results illustrate the occurrence of bottom-up activities aiming to reduce HIV-related stigma in the health care setting. More specifically, the majority of participating HCWs agreed that some colleagues do something to stop HIV-related

stigma in the workplace, such as giving extra support to HIV positive co-workers and/or educating co-workers who stigmatize PLWHA. This finding holds promise that existing grassroots stigma reduction activities could form a basis for interventions aiming to reduce HIV-related stigma in healthcare settings – which “should be a leading priority for health care managers” as articulated by Nyblade et al. (2009) in their review study.

With regard to the second aim, as shown in Figure 1, SEM results show that the latent confidentiality factor was positively associated with the reported willingness to access HIV testing, CD4 cell count and HIV-treatment at the OHU. Furthermore, HIV-related stigma was negatively associated with the reported willingness to use all three HIV services. These findings are in line with previous research, which recognises that HIV-related stigma and breaches in confidentiality act as key barriers to accessing OHU services (Khan et al., 2015; Namakhoma et al., 2010; Nyblade et al., 2009; Siegel et al., 2015; Uebel et al., 2007). In the second SEM model, illustrated in Figure 1, the latent *Fighting-stigma* factor had a significant positive total effect on the reported willingness to use HIV services at the OHU. This indirect effect indicates that a bottom-up climate of fighting HIV-related stigma can stimulate confidentiality in the workplace and diminish the negative effect of HIV-related stigma – resulting in an overall positive effect on the reported willingness to use occupationally-based HIV services.

To the best of our knowledge, ours is the first study to provide a quantitative assessment of the existence and the influence of grassroots stigma reduction activities in health facilities operating in resource-constrained contexts and grappling with a high HIV prevalence. Furthermore, this study comprehensively focuses on both HIV prevention and treatment among HCWs. Our study is nevertheless subject to several limitations. Firstly, during the course of this study South Africa adopted the Universal Test and Treat (UTT) strategy (Department of Health, 2016) which expands access to testing and treatment across a much wider range of providers, including privately owned facilities such as pharmacies. This policy change resulted in on-the-ground changes in the research context, shifting the emphasis

in the *HaTSAH Study* from encouraging HCWs to access HIV and TB testing and treatment at their own OHUs, to the more general aim of improving the environment in which HCWs seek care. The results of our study have to be interpreted within the context of this policy change. Moreover, it was not possible to include the HIV status of the HCWs, as this was not part of the survey for reasons of confidentiality. Furthermore, we could not control for within- and between-variance effects between the different hospitals due to an insufficient number of groups.

Several important insights have emerged from this study, with implications for policy and practice. Results provide an impetus to create a health-enabling labour environment in which HCWs affected by HIV are optimally treated and supported. Encouraging a bottom-up climate of fighting HIV-related stigma might offer the potential to promote a safe environment in which HCWs can seek care. Working with bottom-up change agents could provide a promising avenue for interventions, aiming to optimally support HCWs in resource-constrained contexts. Further qualitative in-depth research is required to get an in-depth understanding of the existing low-cost bottom-up initiatives and how to capitalise upon them. Furthermore, qualitative research will provide impetus to inform future interventions investigating under which conditions and in what way such a bottom-up climate of fighting HIV-related stigma arises in healthcare facilities – aiming to enable interventions to strengthen these stigma-reduction activities.

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References

- Adamsi, S., Ehrlich, R., Ismaili, N., Quaili, Z., & Jeebhay, M. F. (2013). Occupational Health Challenges Facing the Department of Health: Protecting employees against tuberculosis and caring for former mineworkers with occupational health disease. In A. Padarath & R. English (Eds.), *South African Health Review 2012/13* (pp. 67-82). Durban: Health Systems Trust.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*: Guilford Press.
- Brust, J. C., Shah, N. S., Scott, M., Chaiyachati, K., Lygizos, M., van der Merwe, T. L., . . . Moll, A. P. (2012). Integrated, home-based treatment for MDR-TB and HIV in rural South Africa: an alternate model of care. *The International Journal of Tuberculosis and Lung Disease*, *16*(8), 998.
- Buregyeya, E., Nuwaha, F., Wanyenze, R. K., Mitchell, E. M., Criel, B., Verver, S., . . . Colebunders, R. (2012). Utilization of HIV and tuberculosis services by health care workers in Uganda: implications for occupational health policies and implementation. *PLoS One*, *7*(10), e46069.
- Department of Health. (2016). Implementation of the universal test and treat strategy for HIV positive patients and differentiated care for stable patients. [Press release]
- Hatcher, L. (1994). *A step-by-step approach to using the SAS system for factor analysis and structural equation modeling*: Sas Institute.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55.
- International Labour Organisation. (2010). Joint WHO-ILO-UNAIDS policy guidelines on improving health workers' access to HIV and TB prevention, treatment, care and support services: A guidance note *Occupational Health*. Retrieved from http://www.who.int/occupational_health/publications/hiv_tb_guidelines/en/
- Karim, S. A., Karim, Q. A., Friedland, G., Laloo, U., & El Sadr, W. M. (2004). Implementing antiretroviral therapy in resource-constrained settings: opportunities and challenges in integrating HIV and tuberculosis care. *Aids*, *18*(7), 975-979.
- Kebede, B., Abate, T., & Mekonnen, D. (2013). HIV self-testing practices among health care workers: feasibility and options for accelerating HIV testing services in Ethiopia. *Pan African Medical Journal*, *15*(1).
- Khan, R., Yassi, A., Engelbrecht, M. C., Nophale, L., van Rensburg, A. J., & Spiegel, J. (2015). Barriers to HIV counselling and testing uptake by health workers in three public hospitals in Free State Province, South Africa. *Aids Care*, *27*(2), 198-205.
- Mayosi, B. M., & Benatar, S. R. (2014). Health and Health Care in South Africa—20 Years after Mandela. *New England Journal of Medicine*, *371*(14), 1344-1353.
- Mwai, G. W., Mburu, G., Torpey, K., Frost, P., Ford, N., & Seeley, J. (2013). Role and outcomes of community health workers in HIV care in sub-Saharan Africa: a systematic review. *Journal of the International AIDS Society*, *16*(1).
- Namakhoma, I., Bongololo, G., Bello, G., Nyirenda, L., Phoya, A., Phiri, S., . . . Obermeyer, C. M. (2010). Negotiating multiple barriers: health workers' access to counselling, testing and treatment in Malawi. *Aids Care*, *22*(sup1), 68-76.
- Nyblade, L., Stangl, A., Weiss, E., & Ashburn, K. (2009). Combating HIV stigma in health care settings: what works? *Journal of the International AIDS Society*, *12*(1), 15.
- Siegel, J., Yassi, A., Rau, A., Buxton, J. A., Wouters, E., Engelbrecht, M. C., . . . Nophale, L. E. (2015). Workplace interventions to reduce HIV and TB stigma among health care workers—Where do we go from here? *Global public health*, *10*(8), 995-1007.
- Uebel, K. E., Nash, J., & Avalos, A. (2007). Caring for the caregivers: Models of HIV/AIDS care and treatment provision for health care workers in Southern Africa. *Journal of Infectious Diseases*, *196*(Supplement 3), S500-S504.

- UNAIDS. (2017). Country Data - South Africa. *Country Data*. Retrieved from <http://www.unaids.org/en/regionscountries/countries/southafrica>
- van Rensburg, H. C. (2014). South Africa's protracted struggle for equal distribution and equitable access—still not there. *Human Resources for Health, 12*(1), 26.
- Wouters, E., Masquillier, C., Sommerland, N., Engelbrecht, M., Van Rensburg, A., Kigozi, G., & Rau, A. (2017). Measuring HIV-and TB-related stigma among health care workers in South Africa: a validation and reliability study. *The International Journal of Tuberculosis and Lung Disease, 21*(11), S19-S25.