

**Tools to measure HIV Knowledge, Attitudes & Practices (KAPs) in healthcare providers: a systematic review**

**Abstract**

Multiple scales have been developed to measure HIV-related stigma among healthcare providers in lower and middle-income countries. As part of this study to measure HIV stigma in healthcare providers in Australia, we conducted a systematic search to identify and evaluate existing tools designed to measure HIV-related Knowledge, Attitudes and Practices (KAPs) among healthcare providers in higher-income countries. Seven studies were identified that quantitatively assessed perceived HIV stigma among healthcare providers from the patient and/or provider perspectives, including HIV stigma as a primary outcome. These seven studies identified adapted forms of four HIV stigma scales. Assessment of HIV stigma among providers is valuable to better understand how this phenomenon may adversely impact health outcomes, and to inform interventions to reduce stigma and improve healthcare. Developing provider-centred stigma-reduction interventions may also help advance international HIV prevention and care goals.

**Keywords:** HIV stigma, measures, healthcare professionals, Australia, high-income countries

### Introduction

Globally, stigma and discrimination towards people living with HIV (PLWH) are associated with negative health outcomes (Katz et al., 2013; Mahajan et al., 2008; Phelan, Link, & Dovidio, 2008). Despite advances in HIV treatment and management, stigmatising attitudes persist in healthcare providers (Phelan et al., 2008). Stigmatising attitudes are associated with sub-optimal care, discriminatory practices, inequitable access and outcomes (Arya et al., 2014; Goyal et al., 2013; Landon et al., 2005; Ledda et al., 2017). Stigma can also lead to avoidance or delayed HIV testing, condom use, Pre-Exposure Prophylaxis (PrEP) uptake, medication adherence, care linkage and retention (ASHM, 2012; Fortenberry et al., 2002; Katz et al., 2013; Kinsler, Wong, Sayles, Davis, & Cunningham, 2007; Link & Phelan, 2001; Mahajan et al., 2008; Pascoe & Smart Richman, 2009; Vanable, Carey, Blair, & Littlewood, 2006).

While several studies evaluate HIV-related HIV knowledge, attitudes and practices (KAP) and stigma in healthcare workers in lower- and middle-income countries, there are few in higher income countries (Alexandra Marshall, Brewington, Kathryn Allison, Haynes, & Zaller, 2017; Mullens et al., 2017; Rutledge, Whyte, Abell, Brown, & Cesnales, 2011). One of the few available studies by Sears in Los Angeles (USA) between 2003 and 2006, found 56% of skilled nurses, 26% of cosmetic surgeons and 47% of obstetricians (OB) refused services regardless of disease status (Sears, 2008). Other studies document discriminatory practices including patient avoidance (Blake, Jones Taylor, Reid, & Kosowski, 2008; Schuster et al., 2005), differential treatment or extreme precautionary measures (Elford, Ibrahim, Bukutu, & Anderson, 2008; Sayles, Ryan, Silver, Sarkisian, & Cunningham, 2007). With treatment advances making HIV a treatable chronic condition (Jensen-Fangel et al., 2004), and with HIV testing and care moving beyond specialised HIV clinics, it is important to understand non-HIV specialised healthcare providers HIV KAP. This understanding can determine the necessity of interventions to reduce HIV-related stigma within healthcare services (Geter, Herron, &

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

Sutton, 2018; Rueda et al., 2016; Stringer et al., 2016). To measure the effectiveness of interventions however, baseline and post-intervention data are needed. These require credible HIV-related stigma measures. The purpose of this review was to identify and critically evaluate available measurement instruments used in higher-income countries.

### **Methods**

#### **Search strategy**

A systematic review of the literature was undertaken in July 2019 following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2015). The search strategy included a combination of keywords or MESH terms and truncated versions of “stigma,” “discrimination,” “knowledge” “attitudes” “practices” AND “health provider”, “medical provider” or “healthcare professional” AND HIV. We included Knowledge, Attitudes and Practices (KAPs) studies given these include measures of stigmatising attitudes and practices attitudes and practices. PubMed, EMBASE, PsycINFO, CINAHL, Cochrane Library, and HIVA databases were used to identify existing tools to measure changes HIV-related stigma in healthcare professional. Google Scholar, WHO database, OECD online library, BHIVA/CROI/EACS/IAS/NHPC conferences databases and other information sources (such as Trip Database, Google Scholar) identified relevant grey literature. Online/offline literature was screened and selected independently by three investigators who assessed the relevance of article title, abstract, and full text against criteria. Key words used were “tool”, “scale”, “measure”, “instrument” “stigma” “knowledge” “attitudes” “practices” “health professional”, “health provider”, “medical provider”. Literature was limited to studies published in English between January 2005 and 31 December 2018 in high income countries based on World Bank criteria (Fantom & Serajuddin, 2016). Where studies used instruments developed before 2005, we sourced original articles to review development.

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

Several USA scales were developed prior to 2005, including one for hospital workers in 1988 (Pleck, O'donnell, O'donnell, & Snarey, 1988), four for nurses, two in 1994 (Harrison, Fusilier, & Worley, 1994) and 1995 (Preston, Young, Koch, & Forti, 1995), and one in 1997 (Froman & Owen, 1997). These were developed before increased access to combination anti-retroviral therapies (ART). This is important because the advent of ART reframed HIV from an acute, fatal disease to a chronic manageable illness (Samji et al., 2013). This is the reason for selecting two time points.

### **Inclusion criteria**

Eligibility included:

- (1) original research articles/program reports;
- (2) clearly state sample population as health providers who provide HIV services and include those administered only to health professionals;
- (3) measures stigma;
- (4) administered using a standardised, clearly described methodology. Studies were included regardless of the purpose of the measures administered; and
- (5) undertaken in high-income countries (HICs; World Bank, 2018)

### **Data extraction**

Important data from eligible literature were extracted into a standard template. The template included author, year of publication, study location/design, participant characteristics, response rate, methods of testing for validity/reliability, and outcomes. Data were extracted by one reviewer and verified by a second.

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

*(1) Author; (2) Title; (3) Journal; (4) Citation; (5) Study Period; (6) Area (Province, Country); (7) Sample Size And Criteria; (8) Target Population; (9) Study Design; (10) Brief Description Of The Measuring Tool Or Intervention; (11) Purpose Of The Measuring Tool; (12) How Is The Measuring Tool Developed; (13) Measurement Indicators; (14) Validity And Reliability (Risk Of Bias Or Confounding Or Effect Modification In Individual Studies); (16) Study Findings; (17) Conclusion; (18) Impact Factor; (19) Others.*

### **Data quality**

Ten percent of total articles were randomly selected and screened by two reviewers. Discrepancies were resolved through reviewer discussion. The COSMIN (consensus-based Standards for the selection of health Measurement Instruments) methodology for systematic reviews of Patient-Reported Outcome Measures informed the evaluation on the instrument quality. The COSMIN is a tool used to improve the selection of outcome measurement instruments in research and clinical practice (Mokkink, De Vet, et al., 2018; Mokkink, Prinsen, et al., 2018; Prinsen et al., 2018; Terwee et al., 2018). While the COSMIN methodology uses the term “patient”, the methodology is also applicable for non-patient target populations. In this review, the term “patient” is substituted for “health professional” (Mokkink, Prinsen, et al., 2018; Prinsen et al., 2018; Terwee et al., 2018). The COSMIN methodology evaluates an outcome measure reliability, validity, and responsiveness.

Reliability was assessed on internal consistency, reliability, and measurement error. Internal consistency is the degree of interrelatedness among items, assuming the questionnaire is unidimensional (Mokkink et al., 2010). Reliability is defined as the proportion of the total variance in the measurements due to ‘true’ differences between patients (Mokkink et al., 2010) and may include test-retest reliability by calculating the intraclass correlation coefficient. Structural validity is defined as the degree to which scores on the questionnaire were an

adequate reflection of the dimensionality of the construct to be measured (Mokkink et al., 2010). Validity was also assessed based on several measurement properties: content validity (including face validity), structural validity, hypotheses testing for construct validity, cross-cultural validity and criterion validity. The domain responsiveness (includes one measurement property) relates detection of change over time (Mokkink, De Vet, et al., 2018; Prinsen et al., 2018; Terwee et al., 2018). In this study, the properties of specific outcome measures were evaluated separately for each set of items comprising a score or an outcome. Data were extracted into excel sheets based on the COSMIN recommendations and templates (Mokkink, Prinsen, et al., 2018).

[Insert Table 1 near here]

### **Results**

A summary flowchart of the review process (Figure 1) follows the ten steps for conducting a systematic review of outcome measures as described in the COSMIN methodology. Seven studies were retained with the sample sizes ranging from 121 to 1737. All studies focused on sub-populations of healthcare professionals, for example, medical, surgical and gynaecology unit nurses (Farley et al., 2014; Välimäki et al., 2008); substance use and HIV services agencies staff (Windsor, Benoit, Ream, & Forenza, 2013); healthcare providers caring for PLWH, including medical and nursing students (See et al., 2011); mental health organisations staff (Hughes & Gray, 2009); and medical graduates (Estcourt et al., 2009) and included male and female participants. One study was conducted in three countries (Finland, Estonia and Lithuania) (Välimäki et al., 2008), two in United States of America (Farley et al., 2014; Windsor et al., 2013), two in United Kingdom (Estcourt et al., 2009; Hughes & Gray, 2009), and one in Taiwan (See et al., 2011).

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

Each retained instrument was developed to measure distinct constructs of HIV-KAP. One study used a modified version of the Nursing Willingness Questionnaire (NWQ) instrument (Välimäki et al., 2008), developed by Dubbert and colleagues (Dubbert, Kemppainen, & White-Taylor, 1994). The original tool was used in the USA and consisted of a 370-word vignette and 13 items measured on a 5-point scale (Dubbert et al., 1994), while the tools used by Välimäki and colleagues adapted the vignette by shortening it to only 13 English words (Välimäki et al., 2008). Another study developed the Provider Perception Inventory (PPI), a 39-item scale measuring health service providers' stigma towards HIV, substance use, and MSM behaviour, including non-gay identified MSM and women (Windsor et al., 2013). While the paper does not detail theories of stigma, it states the scale development was informed by stigma, oppression, labelling theories (Goffman, 1990; Pescosolido, Martin, Lang, & Olafsdottir, 2008; Young, 1990), and hidden distress (Scambler, 2009). Items were derived from focus group discussions with 18 HIV and substance use clinicians (Windsor et al., 2013). The final instrument included a two-dimensional scale: (1) individual attitudes (19 items); and (2) agency environment (11 items) (Windsor et al., 2013).

Hughes and Gray developed a tool to measure mental health workers' HIV KAP and other sexually transmitted diseases in clients with mental illnesses (Hughes & Gray, 2009). The tool consisted of 12 items related to sexual health promotion attitudes; five on HIV knowledge; 13 regarding risk behaviours and risk factors knowledge; five related to glove wearing; and seven about sexual health promotion practices (Hughes & Gray, 2009). In Taiwan, See and colleagues designed a questionnaire to evaluate how effectively healthcare workers interacted with HIV patients and users of illicit substances using a questionnaire measuring four constructs: discrimination, acceptance of PLWH, acceptance of users of illicit substances, and fear (See et al., 2011). To measure knowledge, attitudes, and practices among healthcare workers treating HIV-infected pregnant women Farley et al. (2014) developed a tool consisting

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

of 18 knowledge items identified from medical literature/CDC guidelines regarding use of antiretroviral therapy (ART) in pregnancy and attitudinal questions modified from the Attitudes Towards Women living with HIV/AIDS Scale (ATWAS; O’Hea, Sytsma, Copeland, & Brantley, 2001; Transmission PoToH-IPWaPoP, 2010). Questions related to practices were developed using clinical guidelines for obstetrical (OB) and HIV care among women of childbearing age and expert opinion (Farley et al., 2014). To measure graduate doctors’ views on preparedness to manage patients with sexual health and HIV-related problems in the United Kingdom, Estcourt and colleagues (Estcourt et al., 2009) developed a questionnaire based on the Core Learning Outcomes in Sexual and Reproductive Health and HIV (Estcourt & Evans, 2005).

Three studies examined HIV stigma and/or HIV-KAP in association with other key factors. In Taiwan, See and colleagues observed healthcare workers who had received training/education on harm reduction or HIV prevention had higher scores for acceptance of HIV patients, acceptance of users of illicit substances, and decreased fear, compared with those with no training (See et al., 2011). Estcourt et al. assessed knowledge and skills in sexual health and HIV medicine in pre-registration house officers (Estcourt et al., 2009). In this study, greater confidence in taking a sexual history, discussing HIV testing with patients (including discussing partner notification), and recognising indicators of HIV infection were independently associated with inclusion of sexual health/HIV in the core curriculum (Estcourt et al., 2009). Using the ‘Willingness to Care for Patients With HIV/AIDS’ instrument, Välimäki et. al found nurses in Finland willing to care for patients with HIV were also more willing to undertake nursing activities for the fictional patient, compared with nurses who were generally not willing to take care of HIV patients (mean score 1.32, SD 0.50 versus mean 1.95, SD 0.90; 45). In the same study, authors found male nurses in Estonia were more willing than female nurses to care for a patient with HIV (mean score 1.34, SD 0.41 versus mean 1.77, SD



## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

0.73,  $P = 0.002$ ; 45). Also, single nurses in Estonia reported less willingness (than widowed or separated nurses) to care for a patient with HIV, while younger nurses were more willing to engage in nursing activities ( $r = -0.23$ ,  $P = 0.017$ ; 45). In Lithuania, nurses with a friend or family member with HIV represented a trend towards more willingness to care for a patient with HIV/AIDS, although this was not statistically significant (Välimäki et al., 2008). In a study of mental health workers, Hughes and Gray reported knowledge about risk behaviours and/or risk factors was associated with previous studies in health promotion ( $B = 0.17$ ,  $t = 2.587$ ,  $p = 0.01$ ; 95% CI 2.15–15.88; Katz et al., 2013). Adherence to glove-wearing was also associated with drug/alcohol training and clinical experience, and knowledge of risk factors was predicted by previous health promotion training ( $B = 0.245$ ,  $t = 3.11$ ,  $p = 0.002$ ; 95% CI 5.55–24.81; Hughes & Gray, 2009). Windsor and colleagues found Catholicism (vs ‘other Christian’) religious identification and general religiosity were associated with less-tolerant HIV attitudes (Windsor et al., 2013).

### **Data quality**

#### **Reliability**

The internal consistency of the NWQ has been established in earlier studies in the United States of America (Dubbert et al., 1994; Kemppainen et al., 1992). In the Välimäki et al. study internal consistency was also very good with the alpha value across the total data set was 0.93 (Finland 0.93, Estonia 0.89 and Lithuania 0.95). Item-to-item correlations (Spearman) were statistically significant for all items of the NWQ, with the exception of bringing a meal tray to the patients versus willingness to clean up faeces or vomit while wearing gloves (Välimäki et al., 2008). In the Välimäki et al. study, retest-retest reliability was not reported (Välimäki et al., 2008), although very good test-retest reliability ( $r = 10$ ,  $p = <.001$ ) was shown by Dubbert and colleagues, however sample size was unspecified (Dubbert et al., 1994).

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

The PPI developed by Windsor et. al (Windsor et al., 2013) demonstrated good internal consistency with overall Cronbach's  $\alpha = 0.87$  (individual attitudes (29 items,  $\alpha = 0.87$ ; agency environment, 10 items,  $\alpha = 0.80$ ). The tool developed by Windsor and Gray to examine KAP of mental health workers regarding HIV and other sexually transmitted infections among people with mental illness demonstrated poor internal consistency across three of the four domains (attitudes to sexual health promotion, 12 items, Cronbach's  $\alpha = 0.23$ ; knowledge about HIV in people with schizophrenia, five items, Cronbach's  $\alpha = 0.43$ ; knowledge about risk behaviours, five items, Cronbach's  $\alpha = 0.62$ ; knowledge about risk factors, eight items, Cronbach's  $\alpha = 0.66$ ). The fourth domain of "glove wearing" demonstrated reasonable internal consistency, Cronbach's  $\alpha = 0.75$ ; Hughes & Gray, 2009.

In Taiwan, See and colleagues developed a tool consisting of four constructs (discrimination, acceptance of HIV patients, acceptance of users of illicit substances, and fear). They used Cronbach's alpha to evaluate the internal consistency of each of the four domains, with each demonstrating reasonable internal consistency (discrimination, four items, Cronbach's  $\alpha = 0.72$ ; acceptance of HIV patients, four items, Cronbach's  $\alpha = 0.69$ ; acceptance of users of illicit substances, four items, Cronbach's  $\alpha = 0.73$ ; fear, four items, Cronbach's  $\alpha = 0.73$  (See et al., 2011). The tool developed by Farley et al, did not report any statistics for internal consistency (Transmission PoToH-IPWaPoP, 2010).

### **Validity**

Several of the included instruments used an expert panel to evaluate face or content validity (Hughes & Gray, 2009). Estcourt and colleagues used the Core Learning Outcomes in Sexual and Reproductive Health and HIV for examining the knowledge, attitudes, and practices of obstetricians/gynaecologists and nurses and caring for pregnant women living with HIV (Estcourt et al., 2009). Farley and colleagues reported checking face validity with experts but did not report on any other validity checking properties (Farley et al., 2014). The original

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

NWQ administered in the USA to over 500 nurses demonstrated good structural validity using Principal Components Analysis (PCA) loading onto a single, unidimensional scale, and accounting for eighty percent of the variance. The Välimäki and colleagues study however, did not report on structural validity nor unidimensionality of the scale.

In developing the PPI, Windsor and colleagues used exploratory factor analysis (EFA) and principal axis factoring with Oblimin (oblique) rotation for the final EFA to confirm structural validity and presence of two distinct sub-scales (individual attitudes; agency environment) (Windsor et al., 2013). Structural equation modelling supported the scale's predictive validity (N=190) (Windsor et al., 2013). The instrument developed by See and colleagues to evaluate professional attitudes of healthcare workers in Taiwan demonstrated good fit to the model using confirmatory factor analysis (See et al., 2011). The AVE (Average Variance Extracted) of the four constructs however was between 0.41 and 0.43, indicating poor convergent validity, however good discriminant validity was demonstrated (See et al., 2011; Strahan & Gerbasi, 1972). Few studies reported on the testing of differential item functioning to reveal if different sub-groups demonstrate different probabilities for endorsing a given item on the instrument. Likewise, while all studies examined internal consistency, few evaluated temporal consistency. Reporting bias may be considered a limitation of all included studies as they all rely on self-reported measures.

### **Discussion**

The results of this systematic review reveal limited empirical evidence on tools measuring KAP (including stigma) among health professionals regarding HIV. Further data may be available in grey literature and non-English studies. These could be useful for future investigation. The other outstanding feature of this review is the limited geographical settings of measures, with just six countries, across three continents (Asia, Europe, North America) represented.

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

There was a high degree of heterogeneity in the range of health professionals and constructs included, which at times seemed to converge with other constructs (e.g. knowledge, attitudes, willingness to care and different population groups such as substance users and MSM). These findings were further coloured by inclusion of a wide range of measures and the broad range of aspects upon which the scale development was based (e.g., theoretical frameworks, medical literature, clinical guidelines, learning outcomes)—indicating varied inductive and deductive processes. Measure items were also developed using a wide range of sources.

Most studies focussed on rating items based on Likert-type responses. The Nursing Willingness Questionnaire however, used a fictional patient scenario (Dubbert et al., 1994; Välimäki et al., 2008). It was apparent across studies that other key factors tended to influence knowledge, attitudes, stigma and practices including type and age of health professional, previous training/education, gender, marital status and religiosity.

Reliability for internal consistency was generally moderate to good across studies, or not reported. Significantly less information was reported regarding temporal reliability. Less is known about the rigour of validity across studies, with factor analytic-type approaches being most frequently employed to substantiate key constructs/sub-scales, while one study included experts to confirm face validity. The majority of studies reporting on validity however, demonstrated good validity.

Limitations of the studies in this review mitigate potential validity and generalisability to other contexts. Many measures aggregated beliefs about groups other than PLWH (e.g., illicit substance users), or focussed on a specific subset of PLWH (e.g. pregnant women), whilst others included health professionals and other groups (e.g., discrimination, acceptance of patients living with HIV)—making it difficult to draw conclusions specific to HIV-KAP in

health professionals. A further gap is no existing research identified from Australia. There were notable changes in terminology over time (e.g. HIV instead of AIDS), treatment, health outcomes and increased acceptance.

Overall, given the limited number of eligible studies, the wide variation in methodological approaches, aggregation of participant groups and KAP characteristics (beyond solely PLWH), and overlapping features with other constructs and groups, further research with methodological and psychometric rigour is required to adequately measure HIV-KAP among health professionals.

### **Conclusions**

This study identified and evaluated available tools for assessing HIV stigma among healthcare providers in higher income countries. A systematic search of the literature indicated that five studies (2007-2014) adopted forms of four different HIV stigma scales. As such, no standardised measures were identified. This synthesis supports the need for a standardised measure with good reliability and validity for assessing HIV stigma among health professionals. Improved measures may be significant in understanding how stigma affects healthcare outcomes and to inform future interventions to reduce stigma and improve healthcare.

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## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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# TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

Table 1

Title	Author/s and year	Study location and language used	Sample size and response rate	Participant characteristic (Study subjects described )	Underlying theory	Cross cultural validity/ measurement invariance	Methods used to assess <b>reliability</b> (if applicable)	Internal consistency	Methods used to assess structural <b>validity</b> (if applicable)
Willingness to care for patients with HIV/AIDS	Välimäki et al, 2008	Finland ,Estonia and Lithuania	Total N=833  (n=427) in Finland, (n=221) in Estonia and (n=185) in Lithuania	Nurses working in medical, surgical and gynaecology units.	A modified version of a scale “willingness to provide nursing care to AIDS patients”  developed in 1994 by	Nurses’ Willingness Questionnaire was translated by official language translators into the most common	The instrument was piloted with intensive care nurses from the same hospitals as those included in the main study as follows: in Estonia n=35	The alpha value in the current study for the total data set was 0.93, which varied as follows: Finland 0.93, Estonia 0.89 and Lithuania 0.95. Item-to-item correlations	Previous studies suggest that this questionnaire is a reliable and valid instrument for evaluating a construct of current concern to nursing administrators and educators.

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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			601 Responded (Average response rate= 72%)		Dubbert et al <sup>1</sup> , was applied. This version was reduced to a vignette of 13 English words to describe a patient with AIDS whose health was	languages used in each country.  Before data collection the questionnaire was piloted in Estonia	(Estonian language n=17, Russian language n=18), and Lithuania n=30.  Pearsons' product moment	(Spearman) were statistically significant for all items of nursing activity except for bringing a meal tray to the patient versus willingness to clean up faeces or vomit	The background variable used showed good face validity

<sup>1</sup> Dubbert PM, Kemppainen JK, White-Taylor D. Development of a measure of willingness to provide nursing care to AIDS patients. Nurs Adm Q 1994; 18(2): 16–21.

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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					deteriorating in a 5 score Likert scale (1 strongly agree, 2 agree, 3 undecided, 4 disagree, 5 strongly disagree)	and Lithuania to refine the instrument to suit different cultural contexts.	correlation coefficients were used to examine correlations between the willingness scale and numerical background variables.	while wearing gloves.	

# TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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The provider perception inventory: Psychometri cs of a scale designed to measure provider stigma	Windsor et al 2013	USA	N=212  89.6% (190 Responded )	HIV and substance abuse service providers	The provider perception inventory (PPI) is a 39-item scale that measures health services providers' stigma about HIV/AIDS, substance use, and MSM behaviour.		Thematic analysis of focus group transcripts were carried out Focus groups members were HIV and substance abuse service providers	The final EFA solution included a total of 39 items across two dimensions: (1) individual attitudes (29 items, $\alpha = 0.87$ ) and (2) agency environment (10 items, $\alpha = 0.80$ ). The overall Cronbach's	2 FGDs conducted for participants from 18 HIV and substance abuse treatment providers for face validity Exploratory Factor Analysis(EFA)  112 of the original items were



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about HIV, substance abuse, and MSM behaviour					The development was Informed by a focus group of health providers and a Spanish HIV/AIDS stigma scale (Varas-Diaz &		who were ethnically diverse and had worked in both residential and outpatient drug treatment as well as harm reduction and HIV outreach and testing.	$\alpha$ for the Provider Perception Inventory(PPI) was 0.87	included in the initial EFA. Items with communalities below 0.3 were dropped and the EFA rerun.  For the final EFA, principal axis factoring were used and oblimin

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					Neilands, 2009 <sup>2</sup> ) and the index of attitudes toward homosexuals (Siebert et al., 2009 <sup>3</sup> ).				(oblique) rotation because factors were expected to be correlated (Costello & Osborne, 2005).After settling on subscale components, a

<sup>2</sup> Varas-Diaz, N., & Neilands, T.B. (2009). Development and validation of a culturally appropriate HIV/AIDS stigma scale for Puerto Rican health professionals in training. *AIDS Care*, 21(10), 1259-1270. doi:10.1080/09540120902804297

<sup>3</sup> Siebert, D.C., Chonody, J., Rutledge, S.E., & Killian, M. (2009). The index of attitudes toward homosexuals 30 years later: A psychometric study. *Research on Social Work Practice*, 19(2), 214-220. doi:10.1177/ 1049731508318553

# TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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					Also informed by stigma, oppression and labeling theories (Goffman, 1959,1963; Pescosolido, Martin, Lang, & Olafsdottir, 2008; Young, 1990) as well as				single structural equations model (SEM) were conducted in Mplus 6.0 with latent indicators for the subscales as dependent variables and provider characteristics as independent

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					Scambler's (2009) hidden distress model				variables(predictive validity) .The SEM final sample (n=190) participants.  Model fit was just within the boundaries of acceptable according to

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									absolute measures of fit (root mean square error of approximation [RMSEA] and standardized root mean square residual [SRMR]) and unacceptable according to incremental

# TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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									measures (Tucker- Lewis Index [TLI] & Comparative Fit Index [CFI])
HIV prevention for people with serious mental illness: a survey of	Hughes & Gray 2007	UK	Sample size= 650 (n = 283) ( 44% response rate)	<b>Mental health workers</b> from NHS mental health services, providing care for working	No validated tool was identified in the literature so the research team designed a questionnaire with 42		Process overseen by multidisciplinary steering group, responsible for protocol development,	The tool demonstrate lower than reasonanle internal consistency  The Cronbach's alpha coefficient for	The face validity of a draft questionnaire was reviewed by the study steering group and amendments were

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mental health workers’ attitudes, knowledge and practice				age adults with mental health problems.	statements organised into five subscales: (1) Attitudes to sexual health promotion (12 items; (2) Knowledge about HIV/AIDS (five items): multiple choice questions		questionnaire design, quality assurance and the dissemination of the findings of the study.  A post-hoc linear regression was performed	‘attitudes to sexual health promotion’ was poor: alpha = 0.23. (individual items were not related to the overall construct)  The Cronbach’s a for ‘knowledge	made accordingly.  The second version was piloted with a group of 10 mental health workers to establish acceptability and face validity.  The final version of the questionnaire had 42 statements

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					;(3) Knowledge about risk behaviours and risk factors for HIV infection (13 items); (4) Glove wearing (five items);(5) Reported sexual health promotion practice (seven		on all the dependent variables to investigate if demographic variables (such as gender, age, professional background) had a significant relationship to	about HIV/AIDS in people with schizophrenia' was 0.43, due to the short subscale (n = 5).  The subscales of 'knowledge about	organised into five subscales.



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					items);(6) Finally, there were two open- ended questions about what training should be available and what services and resources should be available for the prevention of		the scores. Finally, the relationships between attitude, knowledge and reported practice subscales were investigated using Pearson's correlation.	risk behaviours' (a = 0.62) and 'knowledge about risk factors' (a = 0.66)  Alpha coefficient for 'glove wearing' = 0.75.	

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					STI and HIV infection in people with SMI.				
Professional attitude of healthcare workers toward serving HIV/AIDS	See et al, 2011	Taiwan	Sample= 540 (n=251) 90.3% response rate. Only	healthcare workers who, in their work, served HIV/AIDS	After reviewing the relevant literature, four constructs were selected for the questionnaire: discrimination,		Reliability and validity test of confirmatory factor analysis (CFA) used.	Cronbach's alpha to determine internal consistency of observed variables.  Outcome analysis yielded a composite	Ten experts (psychological counselling, medical care, police work, or the penal system) rated the questionnaire on

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patients and drug users: questionnaire design and evaluation of reliability and validity			251 was eligible	patients or drug users, including: public health workers; physicians; registered nurses; pharmacist etc.	acceptance of HIV/AIDS patients, acceptance of drug users, and fear <sup>4</sup> Four questions were designed for each construct		<ul style="list-style-type: none"> <li>•The difference in prior training was evaluated using Independent t-test.</li> <li>•First-order and second-order CFA was used.</li> </ul>	reliability and Cronbach's $\alpha = 0.7$ .  Construct/composite reliability of professional attitudes	appropriateness, comprehensiveness, and relevance, and the mean content validity index was 85.6%. All changes to the questionnaire were made

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<sup>4</sup> (Gerbert et al., 1991; Hong Kong Council of Social Service [HKCSS], 2002; McCann & Sharkey, 1998; Taiwan Root Medical Peace Corps, 2002).

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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					with four answer choices ranging from strongly disagree to strongly agree.  <i>Negative questions were reverse-scored to ensure that the</i>		<ul style="list-style-type: none"> <li>•Structure loading (l) was used to describe the relation between observed variables and latent variables.</li> <li>•Individual item reliability, R2, was used to</li> </ul>	(CR > 0.7) was computed to assess the internal consistency of each observed variable within a latent variable	according to the experts' opinions.  <ul style="list-style-type: none"> <li>•Average variance extracted (AVE) was calculated to examine convergent validity and to discriminate the validity of latent variables.</li> </ul>

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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					<i>direction was consistent for all items and higher scores represented a more positive professional attitude.</i>		assess whether each observed variable reflected the latent variable. •Construct reliability was computed to assess the internal consistency of		(The AVE of the four constructs of job attitude was between 0.41 and 0.43, indicating low convergent validity. •There was a high correlation (r=0.80) for acceptance of HIV/AIDS patients

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							<p>each observed variable within a latent variable.</p> <p>The differences in mean scores for three constructs of the questionnaire (acceptance of HIV/AIDS</p>		<p>and drug users, the square root of the AVE for each construct was greater than the other correlation coefficients, thereby revealing good discriminant Validity.</p>

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							patients, acceptance of drug users, and fear) were statistically significant. Hence, the questionnaire had good reliability and validity		•First-order and second-order confirmatory factor analysis revealed a x2/degrees of freedom B3, goodness-of-fit index (GFI) 0.9, adjusted goodness- of-fit index (AGFI) 0.9, Bentler

# TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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									Bonnett normal fit index 0.9, and a root mean square error of approximation between 0.00 and 0.07 indicating a good fit of the model.



## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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Knowledge, Attitudes, and Practices of OB/GYN Nurses and Auxiliary Staff in the Care of Pregnant	Farley et al 2014	USA	N= 121  Response rate is  57.1%	Obstetric and gynaecological (OB/GYN) healthcare workers	Questionnaire were developed from the following: <ul style="list-style-type: none"> <li>• Medical literature</li> <li>• C.D.C. guidelines on the use of antiretroviral therapy</li> </ul>			Analysis of variance, Kruskal- Wallis, or Independent- samples t tests were used to compare total and subscale attitude survey scores across demographic variables.	Before implementation, the survey components were piloted with a panel of 10 HIV and/or OB nurses and physician specialists for face validity.

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Women Living With HIV					(ART) in pregnancy <sup>5</sup> . • Attitudes Toward Women living with HIV/AIDS Scale <sup>6</sup>			The significance level for this study was set at alpha = 0.05.  With multiple comparisons, a	

<sup>5</sup> (Panel on Treatment of HIV-Infected Pregnant Women and Prevention of Perinatal Transmission, 2010)

<sup>6</sup> (ATWAS; O’Hea, Sytsma, Copeland, & Brantley, 2001) to reflect women of childbearing years and pregnancy.

## TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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					<ul style="list-style-type: none"> <li>Clinical guidelines for OB and HIV care among women of childbearing age as well as expert opinion.</li> </ul>			Bonferroni adjustment was used to lowers the probability of a type I error.	

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How do UK medical graduates rate their knowledge and skills in sexual health and HIV medicine?	Estcourt et al, 2009	UK	Sample size 4746  N=1737  1737 <b>(36.4%</b> response rate).	UK medical graduates of August 2004	Questionnaire were developed using the <b>Core Learning Outcomes in Sexual and Reproductive Health and</b>		The questionnaires were anonymized, but coded to allow a second round of questionnaires to be sent out to non-responders six weeks after the first one	Associations between explanatory factors and confidence measures were presented as odds ratios with 95% confidence intervals and testing based on logistic regression. The simultaneous	Revised the questionnaire after a pilot phase with a small group of preregistration house officers (PRHOs)

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A national survey					<b>HIV<sup>7</sup></b> and used both tick box responses and five-point <b>Likert scales.</b>  (Conducted via postal			association of multiple explanatory factors were examined using multiple logistic regression. Agreement between related items was	

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<sup>7</sup> Estcourt C, Evans DE. Core learning outcomes in sexual and reproductive health and HIV for medical undergraduates: improving skills of future providers. Sex Transm Infect 2005;81:440

# TOOLS TO MEASURE HIV KAPs IN HEALTHCARE PROVIDERS

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					questionnaire survey)			assessed using the kappa statistic	
The Pregnant Women living with HIV Attitude Scale: developmen t and initial	Tyer- Viola &. Duffy, 2009	USA	(N = 210) yielding a response rate	Registered Nurses who provide care in labour and delivery units throughout the USA	Attitudes toward Women living with HIV Scale (ATWAS)(O’Hea et al. 2001) and the Attitudes about People with HIV Scale (APHS) (Green		Reliability was analysed using Cronbach’s Alpha.  Items in the scale was compared for reliability. ‘The	The new measure demonstrated high internal consistency (alpha estimates = 0.89). Principal component analysis yielded a two- component structure	Was previously (2005) developed in 5 stages Face and content validity, pilot testing with OB nurses, factor analysis, and validity testing (N

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psychometric evaluation					1995) were combined to create the Pregnant Women living with HIV Attitudes Scale (PWHAS).		higher the correlations among items, the higher the reliability of individual items' ( DeVellis 1991, p. 80).  More items are needed to	that accounted for 45% of the total variance: Mothering-Choice (alpha estimates = 0.89) and Sympathy-Rights (alpha estimates = 0.72).	= 210) ( Tyer-Viola, 2005 ).  Content validity was used for item pool development and principal component analysis and analysis of variance were used to determine construct validity.

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							determine the reliability of the scale		Hypothesis testing using known groups techniques was carried out to provide further evidence of construct validity.  The 27 items from the ATWAS and



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									the 15-item APHS were combined for face validity assessment by experts in attitude and survey research; maternal child health and psychiatric nursing for PLHIV..