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# Development and Validation of a Culturally Appropriate HIV/AIDS Stigma Scale for Puerto Rican Health Professionals in Training

**Nelson Varas Díaz**[1] and
Graduate School of Social Work Beatriz Lassalle University of Puerto Rico

**Torsten B. Neilands**
University of California at San Francisco Center for AIDS Prevention Studies

## Abstract

HIV/AIDS stigma continues to be an obstacle for primary and secondary HIV prevention. Its consequences for the lives of people living with the disease have been well documented and continue to be of great concern for health care providers and researchers in the field. These consequences are worsened when such stigma emanates from health professionals, as this can limit access to services. One of the main obstacles for HIV/AIDS Stigma research in Puerto Rico is the absence of quantitative measures to assess HIV/AIDS stigma manifestations among health professionals. In light of this gap in the scientific literature, the main objective of this study was to develop and test the psychometric properties of a culturally appropriate HIV/AIDS stigma scale for Puerto Rican health care providers and to develop a reduced form of the scale suitable for use in time-limited clinical settings. The developed measure was based on previous qualitative evidence gathered from Puerto Rican health professionals (Varas-Díaz, Serrano-García & Toro-Alfonso, 2005) and administered to a sample of 421 health professionals in training. The scale addresses 12 HIV/AIDS stigma dimensions. In quantitative analyses 11 of these dimensions demonstrated satisfactory validity and reliability. These dimensions in turn were subcomponents of a higher-order general stigma factor. Implications and limitations of these findings are discussed.

### Keywords

HIV/AIDS Stigma; Measure; Spanish; Health Professionals

The stigma related to HIV/AIDS continues to pose challenges in the lives of people living with HIV/AIDS (PLWHA). These negative attitudes towards the disease foster new infections by hampering prevention efforts (Bwambale et al, 2008; Herek, Capitano & Widaman, 2002). Moreover, HIV/AIDS stigma influences physical health by hindering adherence to antiretroviral treatment and enhancing disease progression (Melchior, 2008; Whetten et al, 2007).

The need to address the stigma surrounding HIV/AIDS and its effects is urgent (American Association for World Health, 2000; Albright, 2000; Fauschi, 2000; NIH, 2000; UNAIDS, 2000). Due to the expected increase in HIV cases by 2020 the stigma surrounding the condition is likely to worsen (NIH, 2001). Such an increase in cases continues to impact Spanish-speaking

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Caribbean countries such as Puerto Rico. The island, is a non-incorporated territory of the United States populated by approximately 4 million people. The CDC (2006) has reported that the AIDS rate per 100,000 individuals is 21.6. The local Health Department has 32,708 reported cases of AIDS and 7,089 of HIV infections (PR Health Department, 2008). As part of the Caribbean, Puerto Rico is located in the second highest prevalence area in the world (PAHO, 2001; World Bank, 2001). Research carried out with PLWHA in Puerto Rico shows that people continue to hold stigmatizing attitudes towards PLWHA (Varas-Díaz, Serrano-García & Toro-Alfonso, 2005). Still, specific research areas related to HIV/AIDS stigma need urgent attention by researchers. Such is the case of stigmatization carried out by health professionals (PAHO, 2003).

## Stigmatization by Health Professionals

People who feel stigmatized by health professionals face problems getting tested for HIV and accessing optimal health services (Davies, Washington & Bindman, 2002; Link & Phelan, 2001; Murray, 2001; Valdiserri, 2002; Weiss & Ramakrishna, 2001). HIV/AIDS stigma has been extensively documented among health services providers (Acuff, et al., 1999; Crawford, 1996; Gordon, Ulrich, Feeley & Pollack, 1993; Horstman & McKusick, 1986; Rizzo, 2002; Silverman, 1993; Stevenson & Strohm Kitchener, 2001; Trezza, 1994; Ventura, 1999). These stigmatizing attitudes are unfortunate since PLWHA need to inform providers of their serostatus in order to receive access to care (Sowell et al., 1997).

Some of the more concerning research findings indicate that medical students in Puerto Rico still stigmatize HIV/AIDS more than other diseases (Malavé & Varas-Díaz, 2006). This has been attributed in the past to the moralizing undertone present in the literature used to train health professionals (De Moor, 2003; O'Rouke, 2001). As if this was not worrisome enough, it has been documented that physicians' negative attitudes towards PLWHA tend to worsen throughout their training (Woloshuk, Harasym & Temple, 2004). These attitudes have been documented from multiple perspectives in other countries. For example, PLWHA and HIV prevention officials have reported stigma as a barrier to health services in the Dominican Republic (Arregui, 2007). The same has been documented among South American populations such as nurses in Suriname and PLWHA in Argentina (Pecheny, Manzelli & Jones, 2007; Roseval, 2007).

## A Cultural Barrier for HIV/AIDS Stigma Research with Health Professionals

Researchers that aim to study HIV/AIDS stigma face difficulties which include: 1) addressing stigma in its cultural context, 2) exploring its manifestations in different scenarios, and 3) researching the targets and perpetrators of stigma (Herek et al., 1998). These domains represent a complex research agenda that even today has not been fully addressed. One of the unaddressed domains is the case of HIV/AIDS stigma measures developed and validated for culturally specific settings and populations, such as Spanish speaking Puerto Rican health professionals.

Quantitative measures have been developed primarily to assess HIV/AIDS stigma among PLWHA (Berger, Ferrans & Lashley, 2001; Yanushka Bunn, Solomon, Miller & Forehand, 2007; Holzmer et al, 2007). Although efforts to develop measures for health professionals have been carried out in developed and developing countries (Mahendra et al, 2007), the published literature does not exhibit a clear concern with measuring HIV/AIDS stigma among Spanish-speaking health professionals, specifically Puerto Ricans. This need to expand the context in which stigma is measured has been mentioned as a gap in HIV/AIDS stigma literature (Nyblade, 2006).

Having culturally appropriate HIV/AIDS stigma measures developed for health professionals in Puerto Rico is an urgent matter for the epidemic in the Island. Understanding and measuring

their stigmatizing attitudes is essential for the development of stigma reduction efforts and their evaluation. Therefore, the first goal of this study was to develop such a measure. Because health professionals in Puerto Rico have little time to complete surveys, a second goal of the study was to create a reduced form of the developed HIV/AIDS stigma measure that would be suitable for use in time-limited situations.

## Method

### Participants

The sample of the study was composed of 421 health professionals in training equally divided among the fields of medicine, nursing, psychology, and social work. The inclusion criteria for participants were that they: 1) were older than 21 years of age; 2) were active practitioners or trainees in their profession at the moment of the interview; and 3) worked or trained in health institutions in which PLWHA could receive services. The research team recruited participants in several settings such as government agencies, hospitals, and universities. Participants completed a screening form and signed a consent form explaining the nature of the study.

The demographic data from participants can be seen in Table 1. Most of the sample was composed of females and had received HIV related training. Half of the sample had provided services to PLWHA at some time. Forty three percent of participants knew someone living with HIV/AIDS. The mean age of participants was 25. The most common income range was $10,000-$30,000 (n=168; 42%).

### Procedure

In order to develop a culturally appropriate scale we based our items on previous qualitative interviews carried out with 80 Puerto Rican health professionals by our research team in 2004 (for full details see: Varas-Díaz, Serrano-García & Toro-Alfonso, 2005). Using the main thematic categories that emanated from that initial qualitative analysis we developed items that would constitute our quantitative measure. We subjected the items to a revision by a panel of seven Puerto Rican experts in HIV research to ensure their cultural appropriateness for our setting and content validity. We incorporated reviewers' suggestions until we reached a 100% agreement from these experts on all items. The resulting scale was composed of 68 items addressing the 12 following constructs related to HIV/AIDS stigma (see Table 2 for a detailed description): fear of infection, emotions associated with HIV/AIDS, closeness to death, PLWHA as vectors of infection, lack of productivity of PLWHA, personal characteristics of PLWHA that foster infection, need to control PLWHA, rights of PLWHA, body signs of HIV/AIDS, responsibility over infection, PLWHA as obliged to reveal serostatus, and the influence of structural factors in HIV infection. These 68 items comprised the Spanish HIV/AIDS Stigma Scale (see Table 3 for all items in Spanish and English). The items were measured with a 5 point Likert-type scale with values ranging from strongly disagree (1) to strongly agree (5). Along with our developed HIV/AIDS stigma scale, participants also completed previously validated measures of homophobia (Toro-Alfonso, 1990) and stigma towards individuals who use drugs (Chappel, Veach & Krug, 1985). Both scales were measured through 5 point Likert-type scales assessing agreement with stigmatizing attitudes and yielded reliable alphas higher than .80 in previous testing.

### Analysis

The Spanish HIV/AIDS Stigma Scale data were analyzed with SPSS version 14. Because each scale item was written to measure one of the twelve stigma dimensions described above and we hypothesized that those stigma dimensions were specific sub-domains of a more general HIV/AIDS stigma factor, confirmatory factor analysis was used to test this hypothesized factor structure. The hypothesized factor structure featured twelve latent factors postulated to explain

the shared variance among the 68 items from the Spanish HIV/AIDS Stigma Scale. Based on our previous experience with other health professionals in Puerto Rico (e.g., nurses, social workers), we anticipated that these twelve latent sub-types of HIV/AIDS stigma would be substantially correlated and would therefore constitute first-order factors that represented shared variance that could itself be explained by a single general second-order HIV/AIDS stigma factor.

As well, one of the goals of the present study was to develop a reduced form of the Spanish HIV/AIDS stigma scale that would yield less respondent burden and that could be administered in time-limited measurement settings. To derive a reduced form of the Spanish HIV/AIDS Stigma Scale implies that at least two confirmatory factor analysis models would be fitted to the data: The first model would evaluate the fit of the factor structure to the original 68 item set whereas the second model would evaluate the fit of the same factor structure to a subset of the original 68 items. The first model tested the hypothesized 12 first-order stigma factors and a single second-order stigma factor structure using the 68 items from the original inventory whereas the second model tested a reduced form of the first model that retained the four items with the largest factor loadings on each respective first-order factor, reducing the number of items to 44 (Loehlin, 1998).

Another approach to validity assessment examines a new instrument's convergency with and divergency from other instruments that have known properties. The present study had three instruments were available for use in convergent and divergent validity analyses: the homophobia scale, the drug user stigma scale, and the item asking respondents if they had themselves tested for HIV recently. To assess convergent and divergent validity, we fitted an extension of the final confirmatory factor analysis model of the reduced form of the Spanish HIV/AIDS Stigma Scale reported above. This model differed from the previous confirmatory factor analysis of the Spanish HIV/AIDS Stigma Scale in that the new model also contained homophobia and drug user stigma scales and the HIV testing item. These measures were correlated with the higher-order stigma factor to assess convergent and divergent validity. We hypothesized that the homophobia and drug user scales would exhibit convergent validity with our HIV/AIDS stigma factor by being correlated with the HIV/AIDS stigma factor because the three constructs are forms of stigma. By contrast, we expected that HIV testing would exhibit divergent validity with HIV/AIDS stigma and would therefore be uncorrelated with HIV/AIDS stigma.

Confirmatory factor analysis models and convergent and divergent validity models were fitted to the quantitative data using M*plus* version 5 (Muthén & Muthén, 2007). Based on the recommendations of Hu and Bentler (1999) overall model fit was assessed using the chi-square test of absolute model fit (Flora & Curran, 2004), and, because the chi-square test is often sensitive to trivial departures from the specified model in large samples (Bollen, 1989), the following descriptive and approximate fit measures were used: the Tucker-Lewis Index (TLI) (Tucker & Lewis, 1973), the Root Mean Square Error of Approximation (RMSEA) (Browne & Cudek, 1993), and the Root Mean Square Residual (WRMR) (Yu, 2002). Given the ongoing debate and evolving understanding of what constitutes acceptable global model fit (Marsh, Hau, & Wen, 2004; Yuan, 2005), we set TLI of .90 or larger, RMSEA equal to .08, and WRMR equal to 1.00 or smaller to indicate desired model fit, but also used these model fit statistics to compare our two models. Reliability of the instrument's subscales was assessed via Raykov's (Raykov, 1997) latent variable-based method, which relaxes the often-unrealistic assumption of equal factor loadings and enables computation of 95% confidence intervals for all reliability estimates.

# Results

## Construct Validity

The first confirmatory factor analysis model ($N$ = 421) consisted of the 12 aforementioned first-order factors that in turn loaded onto the general stigma second-order factor. The chi-square test of absolute model fit was significant, $\chi^2$ (233) = 854.48, $p < .0001$. Collectively, two of the three relative model fit measures also indicated that this model fits the sample date poorly: TLI = .87 and RMSEA = .08 and WRMR = 1.55. Standardized factor loadings and 95% confidence intervals, and standardized factor loadings for this model are shown in Table 4.

Absolute values of factor loadings for 11 of the 12 factors ranged from moderate (e.g., .4, .5) to strong (e.g., .7 or larger) in magnitude. No loading exceeded .5 for the structural concerns factor, however. The poor relationship between the structural factor and its constituent items in conjunction with its poor reliability (described below) prompted us to drop this factor and its items from further consideration in the reduced Spanish HIV/AIDS Stigma Scale.

The second confirmatory factor analysis model featured the reduced version of the Spanish HIV/AIDS Stigma Scale that contained only the items with the four largest absolute standardized factor loadings per first-order factor. This analysis omitted the structural concerns factor that was present in the initial confirmatory factor analysis, so the second model contained 11 first-order specific stigma factors and a single higher-order general stigma factor measured by the 11 first-order factors. The chi-square test of absolute model fit was significant, $\chi^2$ (178) = 670.02, $p < .0001$. Descriptive model fit statistics suggest this model fits the sample data better than the first model, with two of the three descriptive fit indices indicating acceptable model fit to the data and the third, WRMR, showed improvement relative to the first model: RMSEA = .08, TLI = .92, and WRMR = 1.45.

## Reliability

Reliability values and 95% confidence intervals for each of the original subscales and reduced form subscales appear in Table 5.

Most subscales had adequate, good, or excellent reliabilities, though the factors tapping perceived responsibility for HIV/AIDS infections and closeness to death had modest reliability values. The structural concerns factor exhibited unsatisfactory reliability (.43) in the original instrument. When only the best four factor loadings of this subscale were considered, the reliability did not improve to a satisfactory level; in fact, it worsened (value = .20; 95% CI = 0, 1). These findings prompted us to drop the structural concerns factor and its items from the reduced Spanish HIV/AIDS Stigma Scale.

## Convergent and Divergent Validity

Results from this analysis indicated that HIV/AIDS stigma was positively correlated with homophobia (r = .54; 95% CI = .47, .62). Similarly, HIV/AIDS stigma was positively correlated with drug user stigma (r = .38; 95% CI = .30, .47). HIV/AIDS stigma was not associated with having recently obtained an HIV test, however (r = −.01; 95% CI = −.13, .12). Taken collectively, these results provide preliminary evidence that the Spanish HIV/AIDS Stigma Scale has satisfactory convergent and divergent validity.

# Discussion

The results from our data analysis represent a good initial effort in the development process of the Spanish HIV/AIDS Stigma Scale for use in the Puerto Rican context. We believe the

developed measure has several strengths. We used data gathered from extensive qualitative interviews with health professionals in order to develop theoretical dimensions and quantitative items that reflected their concerns. This allowed us to better understand the manifestations of HIV/AIDS stigma in the Puerto Rican setting.

We have set forth the development a multidimensional scale that addresses HIV/AIDS stigma in a plethora of dimensions. Most stigma scales understand the phenomenon as a one-dimensional construct or are limited to a few dimensions. This effort recognized the rich and multidimensional character of HIV/AIDS stigma. Still, this multidimensional aspect of HIV/AIDS stigma measurement yields difficulties, such as that encountered with our structural issues factor. Since so many structural issues can influence HIV infection, these seem to need individual attention in order to be better measured. Combining them (i.e., lack of education, poverty, etc) into one factor could be a potential reason why it yielded such low reliability.

We believe that the development of this scale has many potential implications for future research. For example, the measure can be used in future studies to appropriately assess the impact of stigmatizing attitudes on variables such as service delivery and doctor-patient relations. Furthermore, the measure can serve to assess potential impact of stigma reduction interventions geared towards health professionals in training in Puerto Rico.

Current limitations of our effort include the use of health professionals in training to assess the validity and reliability of the Spanish HIV/AIDS Stigma Scale and less than ideal global model fit results. Future investigations should consider replicating the factor structure among other medical professionals who have more actual experience caring for PLWHA (such as those that have completed their training) and incorporating additional items that may improve the comprehensiveness of the scale and its global model fit in subsequent confirmatory factor analyses. An additional limitation is that data in the current study were not collected via probability sampling methods, which limits the generalizability of our findings to other settings involving health professionals or health professionals in training. Also, the number of available instruments for assessing convergent and divergent validity was quite small due to the lack of appropriate validated instruments in Spanish. A related limitation is that the original item development process relied on qualitative data collection rather than on established stigma scales from other populations and settings as a starting point for item development. Our intention in initiating the item development process with qualitative findings from medical professionals in Puerto Rico was to ensure that their issues were not overshadowed by stigma factors endemic to other settings and populations. Nonetheless, this approach does limit the generalizability and scope of our stigma measure and future investigations should directly compare our scale's content with other stigma scales' dimensions.

More generally, these limitations can inform future studies with Puerto Rican and other Spanish-speaking samples on the subject of HIV/AIDS stigma. In spite of the limitations of the present study and the challenges for future refinement of the Spanish HIV/AIDS Stigma Scale, we believe it represents an important first step in measurement HIV/AIDS stigma among Puerto Rican health professionals and trainees. The Spanish HIV/AIDS Stigma Scale is an initial and important effort in the pursuit of that important research agenda.

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**Table 1**

Demographic Data

| Variable | N | % |
|---|---|---|
| | 421 | 100 |
| Gender | | |
| Male | 101 | 24 |
| Female | 319 | 76 |
| HIV training | 164 | 39 |
| Services to PLWHA | 103* | 45 |
| Knew PLWHA | 171 | 43 |

* Only 228 answered this question.

**Table 2**

Measured Dimensions in the AIDS Stigma Scale.

| Measured Dimension | Description |
|---|---|
| Rights of PLWHA | Restrictive attitudes towards the legal rights of PLWHA. |
| PLWHA as obliged to reveal serostatus | Opinions towards PLWHA not revealing their status to others. |
| Responsibility over infection | Opinions regarding personal responsibility over infection. |
| Lack of productivity of PLWHA | Opinions towards PLWHA as less productive than others. |
| Personal characteristics of PLWHA that foster infection | Opinions regarding personal characteristics that facilitate infection such as promiscuity, lack of strong character. |
| Fear of infection | Personal fear of infection with HIV/AIDS in everyday activities of low and high risk. |
| Emotions associated with HIV/AIDS | Positive and negative emotions that emanate from specific AIDS cases. |
| Closeness to death | Opinions regarding PLWHA closeness to death because of their infection. |
| Need to control PLWHA | Opinions regarding the need to establish controls over PLWHA in order to protect society. |
| PLWHA as vectors of infection | Opinions regarding PLWHA as vectors of infection for those who are seronegative. |
| Body signs of HIV/AIDS | Opinions regarding the visibility of HIV infection and the ability to visually identify PLWHA. |
| Structural Factors | The perceived influence of structural factors on HIV infection. |

## Table 3

Items in the AIDS Stigma Measure in Spanish and English

| | Spanish Version | English Version |
|---|---|---|
| **Rights of PLWHA** | | |
| Item 8 | Una persona con VIH/SIDA tiene derecho a no reveler su estatus a otras personas. | A person with HIV/AIDS has the right to not reveal his/her status to other people. |
| Item 35 | Las personas con VIH/SIDA no deberían adoptar niños/as. | People with HIV/AIDS should not adopt children. |
| Item 36 | Las personas con VIH/SIDA tienen derecho a la confidencialidad. | People with HIV/AIDS have the right to confidentiality. |
| Item 37 | A las personas con VIH/SIDA se les debe penalizar si tienen relaciones sexuales sin revelar su estado de salud. | People with HIV/AIDS should be penalized if they have sexual relations without revealing their health status. |
| Item 39 | Todas las personas con VIH/SIDA deben tener acceso a recibir medicamentos gratuitos y que los pague el estado. | All people with HIV/AIDS should have access to free medications paid by the state. |
| Item 40 | El derecho de las personas con VIH/SIDA se debe limitar para que no trabajen en escenarios de salud. | The rights of people with HIV/AIDS should be limited so that they are not allowed to work in health scenarios. |
| Item 41 | A las personas con VIH/SIDA se les debe ofrecer servicios de salud, pero de acuerdo a los recursos disponibles, por el alto costo de los mismos. | People with HIV/AIDS should have health services, but in accordance to available resources, as these are very expansive. |
| Item 43 | A las personas con VIH/SIDA se les debe obligar a revelar su condición de salud a su doctor/a. | People with HIV/AIDS should be obliged to reveal their health condition to their doctor. |
| **PLWHA obliged to reveal serostatus** | | |
| Item 19 | Debe existir una ley para obligar a las personas con VIH/SIDA a revelar su estatus a sus parejas sexuales. | There should be a law that forces people with HIV/AIDS to reveal their status to their sexual partners. |
| Item 20 | El que una persona con VIH/SIDA no le revele su estatus a su pareja sexual es imperdonable. | It is unforgivable that PLWHA do not reveal their status to their sexual partners. |
| Item 38 | El que una persona con VIH/SIDA no le revele su estatus a su pareja sexual equivale a cometer un asesinato. | The fact that a person with HIV/AIDS does not reveal his/her status to a sexual partner is equivalent to murder. |
| Item 51 | Una persona con VIH/SIDA debe estar obligada a revelar siempre su estatus a los/as profesionales de salud, para que éstos/as tomen las debidas precauciones. | A person with HIV/AIDS should be obliged to reveal their status to health professionals so they can take the proper precautions. |
| Item 64 | El derecho de los/as familiares a saber el estatus de una persona con VIH/SIDA está por encima del derecho de la persona infectada a no revelarlo. | The right of the family to know the HIV status of one of its members is above the right of the infected person to not reveal it. |
| **Responsibility for infection** | | |
| Item 9 | Las personas que se infectaron con VIH por el uso de drogas podrían haberlo evitado si se lo hubieran propuesto. | People who are infected with HIV through drug use could have avoided it if they wanted to. |
| Item 10 | Los/as usuarios/as de drogas infectados/as con VIH se lo buscaron. | Drug users who are infected with HIV asked for it. |
| Item 11 | No me sorprendería que una persona promiscua se infecte con VIH. | I would not be surprised if a promiscuous person got infected with HIV. |

| | Spanish Version | English Version |
|---|---|---|
| Item 12 | Los homosexuales son mayormente responsables de la epidemia del VIH/SIDA. | Homosexuals are predominantly responsible for the HIV/AIDS epidemic. |
| Item 13 | La poca información sobre el VIH/SIDA hace que la gente se infecte. | Little information on HIV/AIDS makes people become infected. |
| Item 14 | La mujer que se queda con su marido a pesar de que este le es infiel, no debe lamentarse si se infecta con el VIH. | A woman who stays with her husband even when he is unfaithful, should not be sorry if she becomes infected with HIV. |
| **Lack of productivity of PLWHA** | | |
| Item 44 | Las personas que no tienen VIH/SIDA pueden trabajar por períodos de tiempo más largos que las que están infectadas. | People that do not have HIV/AIDS can work for longer periods of time than those that are infected. |
| Item 45 | El VIH/SIDA afecta negativamente la productividad de una persona. | HIV/AIDS negatively impacts the productivity of a person. |
| Item 46 | A las personas con VIH/SIDA se les debe asignar trabajos que no requieran mucha actividad física, aunque no lo soliciten. | People with HIV/AIDS should be assigned with tasks that do not require a lot of physical activity, even if they do not ask for it. |
| Item 47 | Una persona con VIH/SIDA se cansa más rápido que una que no lo tiene. | A person with HIV/AIDS gets tired faster than one that does not have it. |
| **Personal characteristics of PLWHA** | | |
| Item 57 | La infección con el VIH es resultado directo de la promiscuidad de las personas. | Infection with HIV is the direct result of people's promiscuity. |
| Item 58 | Las personas que se infectan con VIH es porque han sido irresponsables con el cuidado de su salud. | People get infected with HIV because they have been irresponsible with their health care. |
| Item 59 | Una persona débil de carácter tiene mayor probabilidad de infectarse con el VIH. | A person with weak character has more probability of being infected with HIV. |
| Item 60 | Poseer creencias religiosas reduce el riesgo de contraer el VIH/SIDA. | Having religious beliefs reduces the risks of getting HIV/AIDS. |
| **Fear of infection** | | |
| Item 1 | Me sentiría cómodo/a si un/a cirujano/a con VIH/SIDA me operara. | I would feel comfortable being operated on by a surgeon with HIV/AIDS. |
| Item 2 | Yo no utilizaría utensilios de comer de una persona con VIH/SIDA. | I would not use the eating utensils of a person with HIV/AIDS. |
| Item 3 | Me preocuparía sacarme sangre en un laboratorio donde atienden a muchas personas con VIH/SIDA. | I would be worried if I had to give blood in a laboratory where they provide services to a lot of people with HIV/AIDS. |
| Item 4 | Utilizaría los servicios de un/a dentista que atiende a muchas personas con VIH/SIDA. | I would use the services of a dentist that sees many people with HIV/AIDS. |
| Item 5 | Es recomendable que los/as profesionales en las salas de emergencia use doble guante al trabajar con personas que tienen VIH/SIDA. | It is recommended that health professionals in emergency rooms use double gloves when providing services to people with HIV/AIDS. |
| Item 6 | Me daría miedo el descubrir que he tenido relaciones sexuales con alguien que tiene VIH/SIDA, aún cuando me protegí. | It would scare me to discover that I had sexual relationships with someone that has HIV/AIDS, even when I used protection. |
| Item 7 | Preferiría no tener que sentarme en el inodoro que utilizan personas con VIH/SIDA. | I would prefer not to sit on a toilet that has been used by people with HIV/AIDS. |
| Item 15 | Lo pensaría dos veces antes de comer en un restaurante donde la persona que cocina tiene VIH/SIDA. | I would think twice before eating in a restaurant in which the person that cooks has HIV/AIDS. |

| | Spanish Version | English Version |
|---|---|---|
| **Emotions associated with HIV/AIDS** | | |
| Item 28 | Me causa lástima la mujer que siendo fiel es infectada con VIH por su pareja. | I feel sorry for the woman that while being faithful, is infected with HIV by her partner. |
| Item 29 | Admiro a las personas con VIH/SIDA que responsablemente cuidan de su salud. | I admire people with HIV/AIDS that take care of their health responsibly. |
| Item 48 | Las personas con VIH/SIDA me dan lástima. | I feel sorry for the people that have HIV/AIDS. |
| Item 49 | No me causan lástima los/as usuarios de drogas que se infectan con VIH. | I do not feel sorry for drug users who get infected with HIV. |
| Item 67 | Los homosexuales con VIH/SIDA me dan lástima. | I feel sorry for homosexuals with HIV/AIDS. |
| Item 68 | Me causan lástima los/as niños/as infectados/as con VIH. | I feel sorry for the children infected with HIV. |
| **Closeness to death** | | |
| Item 30 | Las personas con VIH/SIDA están más cerca de la muerte. | People with HIV/AIDS are closer to death. |
| Item 31 | Las personas con VIH/SIDA no deberían adoptar niños/as porque los podrían dejar huérfanos/as. | People with HIV/AIDS should not adopt children because they could leave them orphaned. |
| Item 32 | Las personas con VIH/SIDA que toman sus medicamentos retrasan su muerte. | People with HIV/AIDS who take their medications defer their death. |
| Item 33 | Si me diagnosticaran VIH me preocuparía cuánto tiempo me queda por vivir. | If I were diagnosed with HIV it will worry me how much time I had left to live. |
| Item 34 | Un/a bebé de una madre con VIH/SIDA tiene menos expectativas de vida que el/la de una sin VIH/SIDA. | A baby of a mother with HIV/AIDS has a shorter life expectancy than one without HIV/AIDS. |
| **Need to control PLWHA** | | |
| Item 26 | Los/as niños/as con VIH/SIDA en las escuelas deben estar juntos en el mismo salón. | Children with HIV/AIDS in schools should be in together in the same classroom. |
| Item 61 | Se debe legislar para que las mujeres que tienen VIH/SIDA sean esterilizadas para que no tengan hijos/as. | There should be legislation to sterilize women with HIV/AIDS so they do not have children. |
| Item 62 | Todas las personas con VIH/SIDA deberían tener un identificador que lleven consigo en caso de que sean atendidas en una sala de emergencia. | All people with HIV/AIDS should have an ID with them in case that they are taken to an emergency room. |
| Item 63 | El Departamento de Salud debe mantener al día un registro con nombre y apellido de todas las personas con VIH/SIDA. | The Health Department should have an updated registry with the first and last names of all the people with HIV/AIDS. |
| Item 65 | Debe legislarse para que las personas con VIH/SIDA no puedan casarse. | There should be legislation so that people with HIV/AIDS cannot get married. |
| Item 66 | Debe existir una ley que obligue a las personas con VIH/SIDA a reveler su estatus a sus parejas sexuales. | There should be a law that forces people with HIV/AIDS to reveal their status to their sexual partners. |
| **PLWHA as vectors of infection** | | |
| Item 21 | Una madre que tiene VIH/SIDA es un riesgo de infección para sus hijos/as ya nacidos/as. | A mother that has HIV/AIDS is a risk to her daughters/sons already born. |

| | Spanish Version | English Version |
|---|---|---|
| Item 22 | Una madre que tiene VIH/SIDA debe evitar el contacto físico con sus hijos/as para evitar una posible infección. | A mother that has HIV/AIDS should avoid physical contact with her daughters/sons to prevent a possible infection. |
| Item 23 | Las personas con VIH/SIDA pueden ser una amenaza a la salud pública. | People with HIV/AIDS could be a threat to public health. |
| Item 24 | Existen muchas personas con VIH/SIDA que buscan infectar a otras. | There are a lot of people with HIV/AIDS that seek to infect others. |
| Item 25 | Las personas con VIH/SIDA en Puerto Rico pueden controlar el futuro de la epidemia en nuestro país si se lo proponen. | People with HIV/AIDS in Puerto Rico could control the future of the epidemic in our country if the want to. |
| **Body signs of HIV/AIDS** | | |
| Item 16 | Yo puedo identificar si una persona tiene VIH/SIDA mirando su cuerpo. | I can identify if a person has HIV/AIDS by looking at his/her body. |
| Item 17 | El cuerpo de las personas que piden en las luces me hace pensar que tienen VIH/SIDA. | The bodies of the people that ask for money at street lights make me think that they have HIV/AIDS. |
| Item 18 | Debido al adiestramiento de los/las profesionales de la salud se les hace más fácil identificar quién tiene VIH/SIDA, mirando su cuerpo. | Due to the training that health professionals have it is easier for them to identify who has HIV/AIDS by looking at their bodies. |
| Item 27 | En ocasiones he visto gente extremadamente delgada y he pensado que tienen VIH/SIDA. | On occasions, I have seen extremely skinny people and thought they were had HIV/AIDS. |
| Item 42 | Es imposible identificar si alguien tiene VIH/SIDA mirando su cuerpo. | It is impossible to identify if someone has HIV/AIDS by looking at their bodies. |
| **Structural concerns** | | |
| Item 50 | La gente se infecta con VIH sin importar los niveles de educación formal que tengan. | People get infected with HIV regardless of their formal education levels. |
| Item 52 | Las personas con muchos recursos económicos se infectan con la misma frecuencia que las de escasos recursos. | People with many economical resources become infected with the same frequency as those with low resources. |
| Item 53 | El VIH/SIDA impacta en igual cantidad a las mujeres que a los hombres. | HIV/AIDS impact equal amounts of men and women. |
| Item 54 | Las personas no usan condones para protegerse del VIH/SIDA aunque están fácilmente accesibles. | People don't use condoms to protect themselves even though they are easily accessible. |
| Item 55 | Las personas usuarias de drogas no usan jeringuillas limpias para protegerse del VIH/SIDA aunque están fácilmente accesibles. | Drug users don't use clean needles to Project themselves from HIV/AIDS although they are easily available, |
| Item 56 | En Puerto Rico existe mayor riesgo de infección con el VIH en el área metropolitana que en el área rural. | In Puerto Rico, there is higher risk of infection with HIV in the metropolitan area, than in the rural area. |

## Table 4

Standardized factor loadings and 95% confidence intervals for the original and the reduced AIDS stigma measures

| Factor | Original Inventory | Reduced Inventory |
|---|---|---|
| Rights of PLWHA | 0.96 (1.00, 1.04) | 1.00 (1.00, 1.00) |
| Item 8 | 0.29 (0.19, 0.38) | — |
| Item 35 | 0.68 (0.61, 0.74) | 0.71 (0.65, 0.78) |
| Item 36 | 0.16 (0.06, 0.26) | — |
| Item 37 | 0.58 (0.50, 0.66) | 0.55 (0.47, 0.63) |
| Item 39 | 0.13 (0.03, 0.22) | — |
| Item 40 | 0.74 (0.68, 0.79) | 0.74 (0.68, 0.79) |
| Item 41 | 0.33 (0.24, 0.41) | — |
| Item 43 | 0.59 (0.52, 0.67) | 0.57 (0.49, 0.65) |
| PLWHA obliged to reveal serostatus | 0.81 (0.76, 0.87) | 0.67 (0.59, 0.75) |
| Item 19 | 0.56 (0.48, 0.64) | 0.57 (0.48, 0.66) |
| Item 20 | 0.55 (0.46, 0.64) | 0.58 (0.48, 0.67) |
| Item 38 | 0.66 (0.59, 0.73) | 0.74 (0.66, 0.82) |
| Item 51 | 0.67 (0.58, 0.76) | 0.75 (0.64, 0.85) |
| Item 64 | 0.72 (0.64, 0.80) | — |
| Responsibility for infection | 0.78 (0.71, 0.85) | 0.75 (0.67, 0.82) |
| Item 9 | 0.39 (0.27, 0.50) | 0.40 (0.28, 0.51) |
| Item 10 | 0.65 (0.56, 0.73) | 0.67 (0.58, 0.76) |
| Item 11 | 0.41 (0.31, 0.52) | 0.41 (0.30, 0.52) |
| Item 12 | 0.77 (0.67, 0.87) | 0.81 (0.70, 0.93) |
| Item 13 | −0.13 (−0.24, −0.01) | — |
| Item 14 | 0.54 (0.44, 0.64) | — |
| Lack of productivity of PLWHA | 0.69 (0.62, 0.75) | 0.70 (0.64, 0.76) |
| Item 44 | 0.76 (0.69, 0.83) | 0.75 (0.68, 0.82) |
| Item 45 | 0.76 (0.70, 0.82) | 0.76 (0.70, 0.83) |
| Item 46 | 0.78 (0.72, 0.85) | 0.77 (0.71, 0.84) |
| Item 47 | 0.74 (0.69, 0.80) | 0.75 (0.70, 0.81) |
| Personal characteristics of PLWHA | 0.70 (0.63, 0.77) | 0.70 (0.62, 0.77) |
| Item 57 | 0.69 (0.61, 0.77) | 0.67 (0.60, 0.75) |
| Item 58 | 0.72 (0.65, 0.79) | 0.73 (0.66, 0.80) |
| Item 59 | 0.73 (0.65, 0.81) | 0.73 (0.65, 0.81) |
| Item 60 | 0.63 (0.54, 0.72) | 0.63 (0.55, 0.72) |
| Fear of infection | 0.71 (0.65, 0.77) | 0.66 (0.58, 0.73) |
| Item 1 | 0.53 (0.43, 0.63) | — |
| Item 2 | 0.58 (0.49, 0.67) | 0.63 (0.54, 0.71) |
| Item 3 | 0.61 (0.52, 0.69) | 0.64 (0.55, 0.73) |
| Item 4 | 0.36 (0.26, 0.47) | — |
| Item 5 | 0.63 (0.53, 0.73) | — |
| Item 6 | 0.49 (0.36, 0.61) | — |
| Item 7 | 0.78 (0.71, 0.84) | 0.84 (0.77, 0.91) |

| Factor | Original Inventory | Reduced Inventory |
|---|---|---|
| Item 15 | 0.76 (0.70, 0.83) | 0.81 (0.74, 0.88) |
| Emotions associated with HIV/AIDS | 0.59 (0.52, 0.65) | 0.54 (0.47, 0.61) |
| Item 28 | 0.60 (0.46, 0.73) | 0.58 (0.44, 0.72) |
| Item 29 | −0.01 (−0.26, 0.25) | — |
| Item 48 | 0.93 (0.86, 1.00) | 1.00 (0.92, 1.08) |
| Item 49 | 0.44 (0.31, 0.57) | — |
| Item 67 | 0.61 (0.53, 0.69) | 0.65 (0.58, 0.73) |
| Item 68 | 0.75 (0.65, 0.84) | 0.75 (0.66, 0.85) |
| Closeness to death | 0.89 (0.83, 0.95) | 0.91 (0.85, 0.97) |
| Item 30 | 0.66 (0.60, 0.72) | 0.65 (0.59, 0.72) |
| Item 31 | 0.72 (0.65, 0.79) | 0.73 (0.66, 0.80) |
| Item 32 | −0.18 (−0.28, −0.07) | — |
| Item 33 | 0.49 (0.40, 0.59) | 0.49 (0.39, 0.58) |
| Item 34 | 0.48 (0.40, 0.56) | 0.49 (0.41, 0.57) |
| Need to control PLWHA | 0.92 (0.87, 0.97) | 0.84 (0.78, 0.89) |
| Item 26 | 0.12 (0.01, 0.23) | — |
| Item 61 | 0.60 (0.53, 0.68) | 0.65 (0.57, 0.72) |
| Item 62 | 0.61 (0.54, 0.69) | 0.64 (0.56, 0.72) |
| Item 63 | 0.60 (0.53, 0.67) | 0.62 (0.54, 0.69) |
| Item 65 | 0.74 (0.66, 0.82) | 0.81 (0.74, 0.89) |
| Item 66 | 0.66 (0.57, 0.72) | — |
| PLWHA as vectors of infection | 0.83 (0.78, 0.89) | 0.83 (0.77, 0.88) |
| Item 21 | 0.71 (0.64, 0.78) | 0.73 (0.67, 0.80) |
| Item 22 | 0.76 (0.67, 0.78) | 0.79 (0.70, 0.87) |
| Item 23 | 0.66 (0.58, 0.74) | 0.68 (0.60, 0.77) |
| Item 24 | 0.55 (0.46, 0.64) | 0.54 (0.45, 0.64) |
| Item 25 | 0.49 (0.39, 0.58) | — |
| Body signs of HIV/AIDS | 0.67 (0.60, 0.74) | 0.65 (0.57, 0.72) |
| Item 16 | 0.65 (0.56, 0.74) | 0.69 (0.60, 0.78) |
| Item 17 | 0.74 (0.65, 0.82) | 0.75 (0.65, 0.84) |
| Item 18 | 0.74 (0.66, 0.82) | 0.79 (0.71, 0.87) |
| Item 27 | 0.62 (0.50, 0.73) | — |
| Item 42 | 0.41 (0.30, 0.51) | 0.43 (0.33, 0.54) |
| Structural Concerns | −0.63 (−0.76, −0.51) | — |
| Item 50 | −0.30 (−0.48, −0.13) | — |
| Item 52 | −0.003 (−0.14, 0.14) | — |
| Item 53 | 0.32 (0.20, 0.45) | — |
| Item 54 | 0.28 (0.15, 0.41) | — |
| Item 55 | 0.41 (0.30, 0.53) | — |
| Item 56 | −0.49 (−0.62, −0.37) | — |

Notes: $N = 421$. Loadings for each item represent that item's loading onto its parent factor. Loadings for each factor represent its loading onto the higher-order stigma factor. In the analysis of the reduced version of the scale, the residual variance of the rights factor was set to a small positive value (.001) to ensure a positive-definite implied covariance matrix, as recommended by Chen et al (Chen, Bollen, Paxton, Curran, & Kirby, 2001).

## Table 5

Subscale Reliability Values and 95% Confidence Intervals

| Factor | Original Instrument | | Reduced Instrument | |
|---|---|---|---|---|
| | N | Reliability (95% CI) | N | Reliability (95% CI) |
| Rights of PLWHA | 421 | 0.59 (0.52, 0.66) | 420 | 0.65 (0.59, 0.70) |
| PLWHA obliged to reveal serostatus | 421 | 0.68 (0.62, 0.73) | 421 | 0.66 (0.60, 0.72) |
| Responsibility for infection | 420 | 0.54 (0.48, 0.60) | 420 | 0.62 (0.56, 0.67) |
| Lack of productivity of PLWHA | 420 | 0.79 (0.76, 0.83) | 420 | 0.79 (0.76, 0.83) |
| Personal Characteristics of PLWHA | 419 | 0.71 (0.66, 0.76) | 419 | 0.71 (0.66, 0.76) |
| Fear of infection | 421 | 0.75 (0.71, 0.78) | 421 | 0.76 (0.73, 0.80) |
| Emotions associated with HIV/AIDS | 421 | 0.67 (0.63, 0.72) | 420 | 0.75 (0.71, 0.78) |
| Closeness to death | 421 | 0.55 (0.48, 0.61) | 421 | 0.64 (0.59, 0.70) |
| Need to control PLWHA | 421 | 0.62 (0.57, 0.68) | 419 | 0.66 (0.60, 0.72) |
| PLWHA as vectors of infection | 421 | 0.66 (0.61, 0.71) | 419 | 0.66 (0.61, 0.72) |
| Body signs of HIV/AIDS | 421 | 0.67 (0.62, 0.72) | 421 | 0.68 (0.63, 0.73) |
| Structural concerns | 419 | 0.43 (0.36, 0.51) | — | — |
| General stigma | 421 | 0.86 (0.84, 0.88) | 421 | 0.85 (0.83, 0.87) |

Notes: *N* for each analysis will vary because some participants were missing data for all items in a given subset. Reliability values are computed via Raykov's (1997) structural equation model using M*plus* 5.0.