

*Full Length Research Paper*

# The association of layered stigma and sympathy toward persons living with HIV/AIDS (PLWHA) in Puerto Rico

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**To assess the levels of sympathy expressed toward various persons living with HIV/AIDS (PLWHA) associated with different target groups and to identify the factors associated with sympathy expressed toward various types of PLWHA. Data were collected from 832 HIV-negative female residents of public housing in Ponce, Puerto Rico. Less sympathy was expressed toward drug-using PLWHA when compared to normative contracted cases of HIV/AIDS. They also expressed less sympathy for drug-using PLWHA when compared to non-normative cases of HIV/AIDS. There was no difference in the level of sympathy expressed toward normative compared to non-normative cases of HIV/AIDS. Those respondents who reported knowing a friend or family member living with HIV/AIDS, those who reported being very spiritual, and those with post-high-school education, were more likely to express sympathy toward PLWHA. Findings of these analyses were not consistent with previous research with respect to varying level of negative attitudes toward PLWHA. The findings are important because they shed light on the varying negative attitudes towards PLWHA. As such, messages and interventions must be cognizant of the cultural contexts in which PLWHA live when developing anti-HIV stigma programs and not just the at-risk groups with which the PLWHA are associated.**

**Key words:** HIV/AIDS, persons living with HIV/AIDS (PLWHA), layered stigma, Puerto Rico.

## INTRODUCTION

Previous research has revealed that the degree of acceptance or sympathy toward a particular person living with HIV/AIDS (PLWHA) depends on how he/she contracted the disease (Cao et al., 2006). HIV-related attitudes may therefore, be 'layered' in that they may be attributed both to the particular features of the disease and other non-HIV components. The research examining layered stigma toward PLWHA has been mostly

conducted with health care and social service providers and university students with only a few being conducted with members of the general population.

## HIV in the Caribbean

The Caribbean region is the second most affected region

in the world in terms of HIV prevalence (UNAIDS, 2015). Currently, there are an estimated 260,000 adolescents and adults living with HIV in the region, with an estimated prevalence of 1.6% (Caribbean360, 2014; Avert, 2015). Key populations including men who have sex with men, sex workers, people who use drugs, and transgender people remain most affected by HIV in Latin America and the Caribbean (Caribbean360, 2014). During a three-day workshop that was hosted by the PAN- Caribbean Partnership against HIV/AIDS in 2014, a number of steps included basing policies on good science and reaching out to those who are most affected and at risk and speaking in their language are needed to combat HIV-related stigma. It was also brought up that there is a need for a change in mindset and greater solidarity among Caribbean people to end stigma and discrimination related to HIV/AIDS. It was noted that the Caribbean culture remains one of the biggest barriers to the type of success that is desired, in terms of ending stigma and discrimination. Strong cultural and religious beliefs have led to the isolation of some high risk groups (Caribbean360, 2014).

It was also noted that these majority sentiments continue to interfere with HIV-reduction and treatment among certain groups across the region and that it would not be easy to tackle many of the deeply embedded systems that form part of the cultural and religious principles of many persons in the region. It ended with the statement that "HIV and AIDS cannot be about personal interest, it has to be about the greater good" (Caribbean360, 2014). Stigma surrounding HIV is considered extremely severe in the Caribbean (Avert, 2015). This is mainly because of lack of education on the subject, people are often blamed for contracting HIV, there are many false beliefs about HIV transmission, and HIV is associated with homosexuality (Jamaica Information Service, 2012; The Guardian, 2010). Only five of the Caribbean countries have legalized same sex relationships (International Lesbian, Gay, Bisexual, Trans and Intersex Association, 2012).

In the countries where it is illegal, the stigma surrounding homosexuality is heightened which makes it more difficult for them to access HIV services. Some progress has been made in overcoming stigma, particularly through the work of organizations such as PANCAP Stigma Unit, which represents people living with HIV and collects research about the best practices to fight stigma (PANCAP YouTube, 2012). Also, the Caribbean Broadcast Media Partnership "Live Up' campaign, which aims to remove the taboo attached to HIV by talking about it has been somewhat effective (Avert, 2015). In addition, the Department for International Development will complete their HIV/AIDS work on tackling stigma, but will not fund any other aspect of HIV in the region. This suggests it is realized

that stigma is an area of HIV work that needs focus in the Caribbean (Department for International Development, 2011).

### **HIV in Puerto Rico**

Puerto Rico has one of the highest prevalence and incidence rates of newly diagnosed cases of HIV and AIDS as well as the total number of cases that have been diagnosed since the beginning of the epidemic. As of April 2015, there was an estimated 9965 persons diagnosed with HIV living and 36,939 cases of AIDS diagnosed and living (PR Department of Health, 2015). This represents an incidence rate of 267.46 cases of HIV per 100,000 population and 992.09 cases of AIDS per 100,000 population. This ranks Puerto Rico, among the 50 U.S. states and six dependent territories number nine in HIV incidence compared to number two among AIDS incidence rates among the same areas (CDC, 2015).

When the total number of diagnosed cases, including deaths are figured into the incidence rates, the rates increase to 305.41 cases of diagnosed HIV per 100,000 persons and 1666.55 cases of diagnosed AIDS per 100,000 persons, resulting in a ranking of number six among HIV incidence rates of HIV and number one ranking of diagnosed AIDS cases incidence rates (CDC, 2015; PR Department of Health, 2015). This also converts to an HIV prevalence rate of 0.27% of living HIV diagnosed cases and 0.30% of all diagnosed HIV cases, including deaths. With respect to prevalence of AIDS, 0.99% of diagnosed AIDS cases among those still living and a prevalence rate of 1.67% of those who have been diagnosed with AIDS and may or may not be surviving (PR Department of Health, 2015). Overall, the prevalence of HIV/AIDS among those diagnosed and still living is 1.25 and 1.97% of those diagnosed who may or may not be still surviving (PR Department of Health, 2015). When compared to the other 50 states and five dependent territories, one can see that HIV/AIDS is a severe problem for the Puerto Rican population.

### **Importance and consequences of stigma toward PLWHA in Puerto Rico**

As the number of cases of HIV and AIDS has continued to increase, making it in the top 10 with respect to both prevalence and incidence, attitudes toward members of this ever-growing population remain a critical public health concern. Stigma remains one of the most challenging barriers to maintaining a healthy quality of life for PLWHA. Stigma affects mental health by increasing depression and anxiety and lowering self-esteem. It

affects social health by increasing social isolation. And lastly, it affects physical health by decreasing adherence to HIV treatment or even seeking HIV treatment (Varas-Diaz et al., 2013). While Puerto Ricans are protected by the American with Disabilities Act, this is the only anti-stigma policy in place to protect the rights of PLWHA (ADA, 2015). This gives federal civil rights protections to individuals with disabilities similar to those provided to individuals on the bases of race, color, sex, national origin, age, and religion. Persons with HIV disease, either symptomatic or asymptomatic, have physical impairments that substantially limit one or more major life activities and thus are protected by the ADA.

Persons who are discriminated against because they are regarded as being HIV positive, are also protected, even if they are not infected (ADA, 2015). However, although state and federal laws prohibit much of this discrimination against people with HIV, the ability to enforce those rights usually depends on access to free legal services, which are increasingly limited and not available at all in roughly half of the states in the U.S, or in Puerto Rico. Thus, the potential negative consequences of HIV testing at a particular time or location might inform an individual's decision of whether or when to get tested for HIV. As such, persons who are HIV-infected may not seek treatment for fear of discriminatory attitudes or actions by public health care professionals as well as other members of the PLWHA's social circle. Furthermore, employers may not hire a person whom they believe is HIV-positive because the probability of being brought up on criminal/civil charges is slim to none in Puerto Rico. One positive note is that there are no criminal statutes against PLWHA in Puerto Rico, as compared to a number of U.S. states (The Center of HIV Law and Policy, 2014).

### **Previous research examining HIV-related stigma toward PLWHA globally**

Among the few studies that have examined attitudes toward PLWHA among members of the general population, most have found similar results. For example, a study of a large population in the USA revealed a complex pattern of results, according to the demographics of the respondents. However, the general finding was as expected with more negative attitudes toward PLWHA who were gay men than those who were heterosexual (Herek and Capitanio, 1999). A more recent study of the general population of China examined the levels of discriminatory attitudes toward PLWHA and factors associated with such attitudes. Results indicated that the vast majority of respondents (94.7%) reported at least one negative attitude toward PLWHA. A minority of the respondents reported that the majority of PLWHA are

promiscuous (43.7%). An even smaller percentage reported that PLWHA deserved sympathy (13.9%). Factors associated with negative attitudes toward PLWHA included age, with younger people expressing less negative attitudes. Also, those respondents with higher education were less likely to express negative attitudes toward PLWHA. Lastly, persons reporting being single were less likely to express negative attitudes compared to those who were married or in another marital category (such as divorced, separated, or widowed) (Lau and Tsui, 2005). However, no measures of stigma toward HIV-risk related groups were presented.

In a study of the general population of India, 1076 participants were recruited from a variety of health care organizations. The vast majority of respondents (82.3%) reported that those who get HIV through sex or drug users have got what they deserved. A slight majority (69.1%) reported that female sex workers are mainly responsible for the spread of HIV/AIDS (Ekstrand et al., 2012). Stigma and discrimination toward key affected populations in the Caribbean constitute a strong concern. As such, an exploratory study was conducted among health-care workers and staff of social services agencies in Jamaica and in the Bahamas to identify the presence of stigmatizing attitudes and beliefs and layered stigma among clinical and social services staff. A total sample of 332 respondents provided data. Almost half of the male respondents and a slight majority of the female respondents reported that HIV and AIDS spreads due to immoral behavior (45 vs. 53%).

The vast majority of male and female respondents reported that homosexuality is immoral (70 vs. 79%) and that sex work is immoral (55 vs. 77%). Approximately one-third of the sample agreed that men who have sex with men (MSM) are the ones who spread HIV in the community (37 vs. 39%) and that prostitutes spread HIV into the community as well (37 vs. 32%). However, only a slight minority reported that HIV/AIDS is a punishment for bad behaviours (10 vs. 9%). Overall, the most negative judgments were for MSM followed by sex workers and then PLWHA (Rogers et al., 2014). An earlier study published findings regarding negative attitudes toward various members of groups of PLWHA among university students in Jamaica. Findings revealed that less sympathy was expressed for HIV+ homosexual male, followed by HIV+ female sex workers, and then followed by heterosexual men and then heterosexual women (40 vs. 44, 67 vs. 81%, respectively) (Noman et al., 2006).

### **Previous research examining HIV-related stigma toward PLWHA in Puerto Rico**

A review of the published literature revealed a total of 21 studies that have focused on stigma toward PLWHA in

Puerto Rico. Of these 21 studies, nine focused on attitudes toward PLWHA among health care professionals, including physicians and medical students. All nine of the studies were authored or co-authored by the same individual (Varas-Diaz et al., 2014; Nyblade et al., 2013; Varas-Diaz et al., 2013; Varas-Diaz et al., 2012; Varas-Diaz and Neilands, 2009; Varas-Diaz et al., 2008; Varas-Diaz and Rodriguez, 2007; Ruiz-Torres et al., 2007).

All of these studies examined a variety of aspects of stigma including religion, the development of a tool for measuring HIV-related stigma and health care facility staff, intervention efficacy of SPACES program, gender, development and validation of a culturally appropriate HIV/AIDS stigma scale, stigma combinations using qualitative and quantitative evidence, absence of quantitative measures of stigma, and AIDS stigma manifestations. All of these studies basically reported the same findings that stigma is an obstacle for primary and secondary HIV prevention and exists among health care providers. Only one study presented any evidence of an anti-stigma intervention and it was reported to be effective in reducing stigmatizing attitudes among 2<sup>nd</sup> year medical students (Varas-Diaz et al., 2013). Of the remaining 12 studies, only two examined attitudes toward PLWHA among members of the general population.

Both of these studies (one focused on children and the other focused on impoverished women living in Puerto Rico) found high levels of stigmatizing and discriminatory attitudes (Norman et al., 2009; Gonzalez-Rivera and Bauermeister, 2007). The remaining eight focused on a variety of issues related to stigma toward PLWHA among PLWHA, including men who have sex with men (Rodriguez et al., 2013), HIV-positive youths and adolescents (Fortenberry et al., 2012; Martinez et al., 2012). Also, knowledge of legal rights among PLWHA was also examined and revealed that most of the participants had experienced HIV discrimination (Malavi-Rivera et al., 2012). Another study examined levels of felt stigma among a group of PLWHA.

Results revealed that an overwhelming majority (80%) showed some level of felt stigma and that differences emerged between men and women as well as among various socio-demographic groups including age, educational level, employment status, and marital status. These findings suggest the need to develop culturally sensitive intervention models to reduce the felt-stigma in PLWHA living in Puerto Rico (Jimenez, et al., 2012). Another study examined socio-structural factors and HIV/AIDS stigma and experiences from Puerto Ricans living with HIV/AIDS accessing health services (Rivera-Diaz et al., 2012). Focus groups conducted with nine groups of PLWHA revealed the importance of addressing socio-structural factors when developing stigma-related interventions for PLWHA. Other studies focused on the

development of stigma scales for measuring felt stigma as well as stigma among health professionals in training (Jiménez et al., 2010; Varas-Diaz, and Neilands 2009; Varas-Diaz et al., 2008). Lastly, one study examined AIDS-related stigma and social interaction among PLWHA (Varas-Diaz et al., 2005). Findings from this study support the need for interventions to address AIDS stigma and its consequences.

### **Gaps in the current literature**

Basically, the findings from these limited studies didn't shed a lot of light on what needs to be considered in order for anti-stigma interventions and programs to be effective. They provided a narrow view of stigma in Puerto Rico, primarily focusing on health care professionals. This may be due to the fact that the majority of the studies were authored or co-authored by the same individual and were based on the same data. This review reveals the need for more research based on stigma toward PLWHA from a variety of disciplines explaining the various types and components of HIV-related stigma.

Extensive complex analysis of negative attitudes toward PLWHA among persons who are outside the health care profession, since the majority of a PLWHA's social circle include persons who are not health care professionals is required to provide an expansive picture of the impact and consequences of stigma toward PLWHA, as experienced by PLWHA. As such, only two studies were identified that examined negative attitudes toward PLWHA who were not members of the health care profession.

### **Hypotheses to be tested by current analysis**

Based on the review of the literature examining stigma toward PLWHA in Puerto Rico, the current study seeks to measure the differences in expressed sympathy towards members, various groups of PLWHA and to identify the factors associated with expressed sympathy. The following hypotheses will drive the analyses:

H1: Expressed sympathy will be higher for normative contracted cases of PLWHA when compared to expressed sympathy toward drug-using PLWHA.

H2: Expressed sympathy will be higher for normative contracted cases of PLWHA when compared to expressed sympathy toward non-normative contacted cases of PLWHA.

H3: There will be no difference between expressed sympathy toward drug-using PLWHA and non-normative contracted cases of PLWHA.

H4: Factors predicting expressed sympathy will vary according to the target group to which the PLWHA is associated.

## METHODOLOGY

### Data collection

Data for these analyses were taken from Proyecto Muchas, an HIV-risk-reduction project funded to target only women living in public housing in Ponce, Puerto Rico. For the project, we developed a 219-item questionnaire that explored knowledge on HIV/AIDS education and prevention. Instruments from other Caribbean studies and from the Centers for Disease Control and Prevention (CDCP) were used to facilitate the development and inclusion of standard questions that have been found to deliver reliable and valid measures of HIV-related attitudes and behaviours across various samples (CDC, 1992; Ministry of Health, 2004). Our survey instrument was reviewed and approved by the Institutional Review Board, Ponce School of Medicine and included items addressing knowledge of transmission; knowledge of risks associated with specific sexual behaviours; attitudes towards persons living with HIV/AIDS; HIV-testing behaviours; sexual history; attitudes towards condoms and safer sex; sexual behaviours by steady and non-steady sex partners; drug and alcohol use.

A non-probability sample was employed for the study; all eligible women were invited to participate. Eligibility criteria were that the potential participant be female and that she lived in the public housing development. Public housing developments in Puerto Rico are a subsidized system of housing units, mostly consisting of housing projects which are provided for low-income families in Puerto Rico (Wikipedia, 2015). A total of 1138 women signed a written informed consent form and the survey was administered by the principal investigator and the research assistants. Data were gathered from 1138 women between April and August 2006 in 23 various public housing developments across the city of Ponce. There was no age criterion for participation in this formative phase of the research. For those women under the age of legal consent in Puerto Rico, which is 21 years of age, all participants signed a written informed consent and were all sexually experienced, and some were married and/or pregnant. The IRB approved this strategy for dealing with these women under the age of 21 years.

### Variables

A number of variables were used in these analyses. Some variables were recorded to facilitate the logistic regression analyses. The following operationalizations were used:

#### *Sympathy*

Target groups were combined and dichotomized into the following categories: normative cases of HIV/AIDS (included heterosexual men and women) and non-normative sexually contracted cases of HIV/AIDS (included homosexual men, female sex workers) and drug using PLWHA (male and female drug users). Normative behaviours are behaviours that are considered acceptable or proper by a social group (The Free Dictionary, 2011). Non-normative behaviours are considered varying from the standard and

not based on a norm (The Free Dictionary, 2011). Expressed sympathy towards children was excluded from the analysis since over 90% expressed complete sympathy towards members of this target group. A new variable was created for each of the target groups listed above, summing all of the sympathy scores, ranging from 0 to 2. Scores were recorded into two groups: complete sympathy (1) and no expressed sympathy (1). Those who reported some level of sympathy for one of the target group members living with HIV/AIDS were deleted from the analysis.

#### *HIV awareness*

Women were asked whether they knew someone who was infected with HIV or who had died from AIDS. Four response categories were used: (1) yes, a family member or friend; (2) yes, but not a family member or friend; (3) no; and (4) do not know. A new variable was created by trichotomizing the responses: "yes, family member or friend" (1); "yes, not a family member nor friend" (2) and, "no/do not know" (3).

#### *HIV education*

Women were asked whether they had attended a lecture, course or community forum about HIV/AIDS at any time in the 12 months before the survey. Those who reported attending such an activity were coded as "having received HIV/AIDS education" (1), while the remaining women were coded as "not having received HIV/AIDS education" (0).

#### *Spirituality*

Women were asked to report how spiritual they were, using a 5-point Likert scale, ranging from not at all spiritual to very spiritual. Responses were dichotomized into "very spiritual" (1) with the remaining responses being coded as "less than very spiritual" (0).

#### *Religious service attendance*

Women were asked how often they had attended religious services in the previous month. Responses ranged from never, once, 2 to 3 times a month, once a week, and more than once a week. Responses were trichotomized into the following categories: "never" (1); "less than once per week" (2); and, "attending once a week or more" (3).

#### *Relationship status*

Those who reported being married or involved in a common-law relationship were coded as "having a stable relationship" (1) compared to those who reported being single, divorced, widowed, and/or separated were coded as "having an unstable relationship" (0).

#### *Employment status*

Women were asked to report whether they were working, either full-time or part-time, or were unemployed. Those reporting working part-time or full-time was coded as "employed" (1), while the

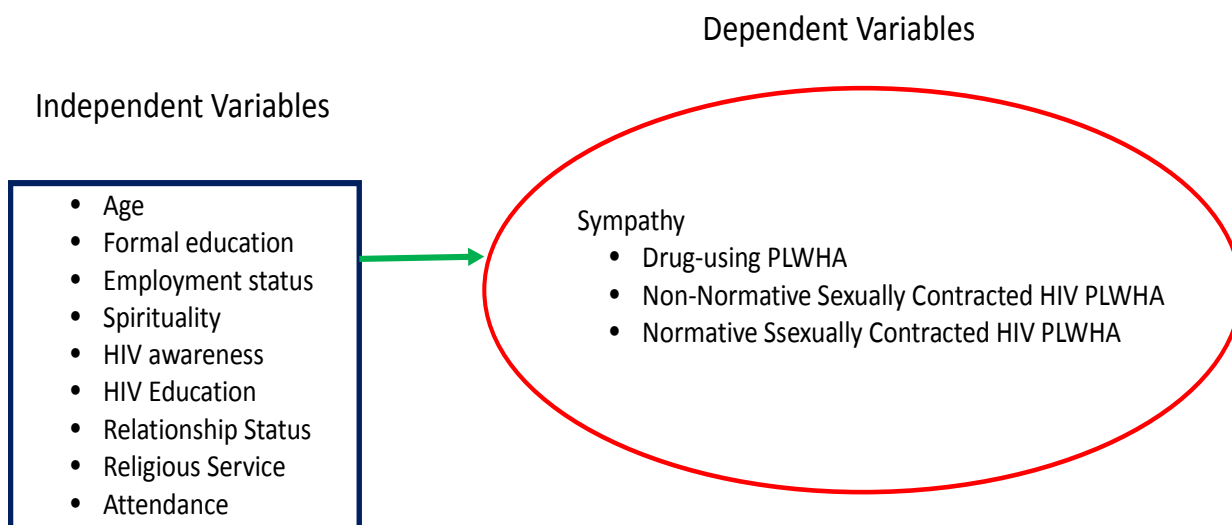


Figure 1. Conceptual Model.

remaining women were coded as “unemployed” (0).

### Age

Women were asked to report their age, in years, on their last birthday. A new variable was created by trichotomizing the reported ages. Those reporting being under the age of 25 years were coded as “youths” (1) while those who reported being between the ages of 25 and 49 were coded as “middle-aged adults” (2) and the remaining women aged 50 and older were coded as “older adults” (3) (WHO, 2000).

### Formal education

Women were asked what level of school they had completed. The responses were trichotomized into the following categories: Those who reported having completed less than high school were coded as “having less than a high school education” (1); those who reported having at least a high-school education were coded as “having a high-school education (2); with the remaining women reporting having post-high school education were coded as “having post high-school education” (3).

### Data analysis

Logistic regression analyses were employed in order to understand the relationship among all the model variables with respect to the dependent variables of interest. This type of regression analysis is used for categorical outcomes of interest or dependent variables (Cohen and Cohen, 1983). All model variables have been dichotomized or trichotomized to facilitate the logistic regression analyses. Figure 1 illustrates the conceptual model. The model chi-squared test, which assesses the extent that the model independent variables are: as a whole; related to the log odds of the dependent variable for a given regression analysis and indicates whether the models in the logistic regression models are statistically significant.

## RESULTS

### Sample characteristics

A total of 832 female residents of public housing who self-reported a history of HIV testing and reported a negative test result, provided data for the current analyses. The majority of the respondents were between the ages of 25 and 49 years (68.1%), with the mean age being 36.28 years ( $S_x = 11.56$ ) and ranging from 16 to 76 years of age. A slight majority were in a stable relationship (51.8%). A slight majority reported having at least a high-school education (51.6%) with a very small percentage reporting post-high school education (2.6%). The vast majority of the respondents were unemployed (88%). A minority of the respondents reported being very spiritual (30.8%) with the vast majority of them reporting attending religious services in the previous month as less than once or week or never (75.5%). Almost half of the women reported attending an HIV lecture or forum in the previous year (48.9%) with the majority reporting knowing a family member or friend living with HIV/AIDS (62.8%).

### Expressed sympathy

Sympathy levels varied depending on the target group to which the PLWHA was associated. Drug-using males received the lowest level of sympathy while children living with HIV received the highest level of sympathy, ranging from 62.6 to 90.2%. When sympathy was examined by gender of PLWHA, sympathy towards females living with HIV/AIDS, regardless of target group with which they were associated, was slightly higher than that expressed for male PLWHA (72.2 vs. 68.4%). Lastly, when PLWHA

were combined by target group to which they were associated, sympathy expressed towards drug using PLWHA was lower than that expressed for normative (heterosexual contracted cases) (63.1 vs. 76.0%,  $X^2(1) = 10.13$ ,  $p = 0.001$ ). The same trend was found when examining expressed sympathy towards drug-using PLWHA and non-normative (homosexual and sex workers contracted cases) (63.1 vs. 72.9%,  $X^2(1) = 9.32$ ,  $p = 0.001$ ). However, there was no difference between expressed sympathy towards non-normative and normative cases (76.0 vs. 72.9%,  $X^2(1) = 1.787$ ,  $p = 0.181$ ).

### Expressed sympathy by sample characteristics

Chi-squared analysis was used to examine the associations between expressed sympathy by target group and sample characteristics. With respect to drug-using PLWHA, only three of the eight independent variables were statistically significant. Women who had post-high school education were more likely than those less educated to express sympathy towards members of this target group (74.3 vs. 57.4 and 66.1%, respectively,  $X^2(2) = 11.016$ ,  $p = 0.004$ ). Also, those women who reported being very spiritual were more likely to express sympathy than were those who reported being less spiritual (69.2 vs. 60.9%,  $X^2(1) = 4.604$ ,  $p = 0.035$ ). Lastly, those women who reported knowing a family member or friend living with HIV/AIDS were more likely to express sympathy than those who reported knowing someone but not a family member or friend reported knowing no one (68.8 vs. 52.4 and 53.7%, respectively,  $X^2(2) = 18.607$ ,  $p < 0.001$ ). There were no differences between the remaining independent variables and expressed sympathy towards drug-using PLWHA.

With respect to expressed sympathy towards non-normative cases of PLWHA, four of the eight independent variables were at least marginally significant. Women who had post-high school education were more likely than those less educated to express sympathy towards members of this target group (88.8 vs. 68.5 and 73.0%, respectively,  $X^2(2) = 9.95$ ,  $p = 0.007$ ). Also, those women who reported being very spiritual were more likely to express sympathy than were those who reported being less spiritual (77.9 vs. 71.4%,  $X^2(1) = 3.563$ ,  $p = 0.059$ ). Lastly, those women who reported knowing a family member or friend living with HIV/AIDS were more likely to express sympathy than those who reported knowing someone but not a family member or friend or reported knowing no one (80.2 vs. 60.9 and 58.7%, respectively,  $X^2(2) = 34.715$ ,  $p < 0.001$ ).

Lastly, those women who reported working either full or part-time were more likely to express sympathy than the unemployed women (80.9 vs. 72.0%,  $X^2(1) = 3.156$ ,  $p =$

0.076). There were no differences between the remaining independent variables and expressed sympathy towards non-normative PLWHA. With respect to expressed sympathy towards normative cases of PLWHA, four of the eight independent variables were at least marginally significant. Women who had post-high school education were more likely than those less educated to express sympathy towards members of this target group (84.7 vs. 72.6 and 77.4%, respectively,  $X^2(2) = 5.152$ ,  $p = 0.076$ ). Also, those women who reported being very spiritual were more likely to express sympathy than those who reported being less spiritual (77.9 vs. 71.4%,  $X^2(1) = 3.563$ ,  $p = 0.059$ ).

Also, those women who reported knowing a family member or friend living with HIV/AIDS were more likely to express sympathy than those who reported knowing someone but not a family member or friend or reported knowing no one (82.3 vs. 63.4 and 67.3%, respectively,  $X^2(2) = 26.987$ ,  $p < 0.001$ ). Lastly, those women who reported working either full or part-time were more likely to express sympathy than were unemployed women (82.3 vs. 64.4%,  $X^2(1) = 4.310$ ,  $p = 0.038$ ). There were no differences between the remaining independent variables and expressed sympathy towards normative PLWHA.

### Multivariate analyses

Tables 1 to 3 display the logistic regression results for the three target groups of PLWHA. For all the logistic regression models, only those variables that were at least marginally significant in the bivariate (chi-squared analyses) were included in the model. For the model depicted in Table 1, in which complete sympathy expressed towards drug-using PLWHA is compared to no sympathy expressed, three of the four independent variables were statistically significant in the final adjusted model. Women who reported having a high school education, were less likely to express complete sympathy towards drug-using PLWHA than those with a post high-school education (Odds Ratio (OR) = 0.47, 95% Confidence Interval (CI) = (0.26 to 0.85)). Women who reported being very spiritual were more likely to express complete sympathy when compared to those who reported being less than very spiritual (OR = 1.58, CI = 1.11 to 2.26). Lastly, women who report knowing a PLWHA who was a family member or friend were two times more likely to express complete sympathy towards drug-using PLWHA when compared to those women who reported not knowing any PLWHA (OR = 2.01, CI = 1.28 to 3.16).

For the model depicted in Table 2, in which complete sympathy expressed towards non-normative cases of PLWHA is compared to no sympathy expressed, three of the four independent variables were statistically significant. Women who reported having a high school education and less than high school education were less

**Table 1.** Logistic regression analyses results for univariate, adjusted, and final adjusted models for sympathy towards drug-using PLWHA.

Independent variable		Unadjusted model OR (95% CI)	Adjusted model OR (95% CI) $X^2 (6) = 27.50, p < 0.001$	Adjusted model OR (95% CI) $X^2 (5) = 27.78, p < 0.001$
Education	<High school	0.65 (0.36 - 1.17)	0.67(0.37 - 1.21)	0.72 (0.39 - 1.30)
	High school	0.44 (0.25 - 0.79)**	0.48 (0.27 - 0.86)*	0.47 (0.26 - 0.85)*
	Post high school (referent)	-	-	-
Employment Status	Employed	1.31 (0.82 - 2.09)	1.35 (0.84 - 2.20)	-
	Unemployed (referent)	-	-	-
Spirituality	Very	1.44 (1.03 - 2.02)*	1.35 (1.03 - 2.02)*	1.58 (1.11 - 2.26)*
	Less than very (referent)	-	-	-
Know PLWHA	Yes, family and/or friend	1.90 (1.24 - 2.91)**	1.85 (1.17 - 2.84)**	2.01 (1.28 - 3.16)**
	Yes, not family or friend	0.95 (0.58 - 1.55)	1.04 (0.62 - 1.75)	1.07 (0.63 - 1.81)
	No, do not know anyone (referent)	-	-	-

<sup>†</sup>p < 0.10; \* p < 0.05; \*\*p < 0.01; \*\*\* p < 0.001.

**Table 2.** Logistic regression analyses results for univariate, adjusted, and final adjusted models for sympathy towards non-normative sexually contracted cases of PLWHA.

Independent Variable		Unadjusted model OR (95% CI)	Adjusted model OR (95% CI) $X^2 (6) = 41.54, p < 0.001$	Adjusted model OR (95% CI) $X^2 (5) = 43.26, p < 0.001$
Education	<High school	0.41 (0.20 - 0.783)*	0.39 (0.20 - 0.79)**	0.39 (0.20 - 0.76)**
	High school	0.33 (0.16 - 0.67)**	0.36 (0.18 - 0.72)**	0.36 (0.19 - 0.71)**
	Post high school (referent)	-	-	-
Employment Status	Employed	1.65 (0.95 - 2.88) <sup>†</sup>	1.40 (0.82 - 2.38)	-
	Unemployed (referent)	-	-	-
Spirituality	Very	1.44 (0.99 - 2.10) <sup>†</sup>	1.40 (0.97 - 2.01) <sup>†</sup>	1.42 (0.99 - 2.03) <sup>†</sup>
	Less than Very (referent)	-	-	-
Know PLWHA	Yes, family and/or friend	2.86 (1.82 - 4.85)***	2.71 (1.73 - 4.25)***	2.92 (1.88 - 4.54)***
	Yes, not family or friend	1.10 (0.66 - 1.81)	1.32 (0.79 - 2.20)	1.40 (0.85 - 2.32)
	No, do not know anyone (referent)	-	-	-

<sup>†</sup>p < 0.10; \* p < 0.05; \*\*p < 0.01; \*\*\* p < 0.001.



normative PLWHA when compared to those women who reported not knowing any PLWHA (OR = 2.92, CI = 1.88 to 4.54). Women who reported being very spiritual were more likely to express complete sympathy when compared to those who reported being less than very spiritual (OR = 1.68, CI = 1.16 to 2.43). Also, women who reported being employed, compared to those who are unemployed, were more likely to express complete sympathy (OR = 1.64, CI = 0.96 to 2.83). Lastly, women who reported knowing a PLWHA who was a family member or friend were two times more likely to express complete sympathy towards normative PLWHA when compared to those women who reported not knowing any PLWHA (OR = 2.06, CI = 1.32 to 3.24).

## DISCUSSION

With respect to the hypotheses being tested, of the first three, only one hypothesis was supported. Women reported higher levels of sympathy towards normative sexually contracted cases of PLWHA when compared to drug-using PLWHA. This finding is consistent with the previous literature that has found that persons expressed more negative attitudes towards PLWHA who contract the disease by behaviours considered immoral or illegal, such as drug use (Batson et al., 2002; Hayes et al., 2002; Peltzer et al., 2004). However, when normative cases of PLWHA were compared to non-normative cases of PLWHA, there was no significant difference in the level of sympathy expressed for members of these target groups. In addition, with respect to the third hypothesis, which hypothesized that there would be no difference in the level of sympathy expressed between those who engaged in non-normative behaviours (such as homosexual sex and commercial sex work) and drug use, respondents reported significantly higher levels of sympathy toward non-normative cases of PLWHA than they did towards drug-using PLWHA.

These findings goes against all of the previous literature that revealed that persons expressed more negative feelings towards those who engage in immoral or illegal behavior, such as homosexual sex and commercial sex work (Parker and Aggleton, 2000; de Bruyn 1998; ICRW, 2002). Previous research with members of the general population as well as those with health-care providers and students, were consistent in their findings of more negative attitudes towards homosexual sex and commercial sex work than those expressed towards normative sexually contracted cases or those that contracted it through blood transfusions and perinatal transmission. While these women did report more sympathy for children who are living with HIV/AIDS, they did not hold the same negative attitudes towards homosexual men or commercial sex work. One possible

explanation for this may be due to the fact that the entire sample was women and previous literature has shown that men hold more negative attitudes towards homosexual males living with HIV/AIDS than heterosexual males living with HIV/AIDS (Norman et al., 2006).

Another explanation could be that this is a very impoverished population and many of these women may know of women who engage in commercial sex or they may even engage in this behavior themselves (these data were not collected). As such, their expressed sympathy would be comparable to that expressed towards females living with HIV/AIDS who are not commercial workers. Previous research has revealed that people who identify with members of the target group hold more positive attitudes towards these members (Batson et al., 2002). The surprising finding was that less sympathy was expressed towards drug-using PLWHA when compared to non-normative sexually contracted cases of HIV/AIDS. This may be due to the stigma that is attached to drug use in Puerto Rico. Puerto Rico is the only country in the Caribbean where injecting drug use is the number one mode of transmission among men and the second highest mode of transmission among women (PR Department of Health, 2015). The stigma is high as such that women were just as likely to report being HIV positive than to report a history of illicit drug use (data not shown). Drug-use is under-reported among women who live in public housing (Colon et al., 2001) due to the stigma attached to the behavior.

Another interesting finding that emerged was the level of sympathy expressed towards female PLWHA as compared to male PLWHA. Previous research has found less favorable attitudes towards women, compared to men living with HIV/AIDS (de Bruyn, 1992). However, our study did not support this finding. Our respondents showed significantly more sympathy towards female PLWHA than for male PLWHA. This may be due to the fact that our entire sample was female and may have felt more in common with female PLWHA than male PLWHA and as such, expressed more sympathy towards them. With respect to the fourth hypothesis, there were basically no differences among the independent factors associated with the various types of PLWHA. The only difference was the magnitude of the strength of the association between each independent variable and the dependent variable, which was complete sympathy expressed towards members of various target groups of PLWHA. Again, this finding is inconsistent with respect to previous research that has examined this same relationship (Norman et al., 2006). However, the findings were consistent with previous literature that has examined factors associated with attitudes toward PLWHA, including knowing a PLWHA, and having a higher education, and being more spiritual (Lau and Tsui,

**Table 3.** Logistic regression analyses results for univariate, adjusted, and final adjusted models for sympathy towards normative sexually contracted cases of PLWHA.

Independent variable		Unadjusted model OR (95% CI)	Adjusted model OR (95% CI) $\chi^2(6) = 34.53, p < 0.001$	Adjusted model OR (95% CI) $\chi^2(6) = 34.53, p < 0.001$
Education	<High school	0.62 (0.31 - 1.24)	0.56 (0.29 - 1.07)+	0.56 (0.29 - 1.07)+
	High school	0.48 (0.24 - 0.95)*	0.54 (0.28 - 1.03)*	0.54 (0.28 - 1.03)+
	Post high school (referent)	-	-	-
Employment Status	Employed	1.91 (1.03 - 3.53)*	1.64 (0.96 - 2.83)+	1.64 (0.96 - 2.83)+
	unemployed (referent)	-	-	-
Spirituality	Very	1.79 (1.18 - 2.71)**	1.68 (1.16 - 2.43)**	1.68 (1.16 - 2.43)**
	Less than very (referent)	-	-	-
Know PLWHA	Yes, family and/or friend	2.26 (1.39 - 3.68)**	2.06 (1.32 - 3.24)**	2.06 (1.32 - 3.24)**
	Yes, not family or friend	0.84 (0.49 - 1.43)	0.97 (0.58 - 1.6372)	0.97 (0.58 - 1.6372)
	No, do not know anyone (referent)	-	-	-

+p &lt; 0.10; \* p &lt; 0.05; \*\*p &lt; 0.01; \*\*\*p &lt; 0.001.

2005). While the current study has provided insight into layered stigma among PLWHA, it is important to note certain limitations of the study that may impact the validity of the findings. The sample was a non-random sample, consisting of persons who volunteered to participate in the study. Also, the findings are based on self-reported data, which may be subjected to recall bias. As such, the generalizability of these results to the female population of public housing in Puerto Rico may be limited.

## Conclusion

The study findings indicate that if sympathy towards PLWHA is to be improved, targeted messages focusing on a specific sexual or drug using group may be needed. It has been reported that available research provides limited support for efforts that focus on changing stigmatizing attitudes through "empathy inducement" or other psychological interventions (Aggleton et al., 2003). It is possible, however, that the message disseminated in these interventions have been general, as opposed to target group specific. As mentioned earlier, only one anti-stigma intervention study was found that was published (Varas-Diaz, 2013). However, previous research, in which individual from target groups are part of the intervention in other geographic areas, has found a significant increase in empathy and positive attitudes towards the specific stigmatized group to which the included individual belonged (Rutledge and Abell, 2005). These findings are encouraging and lend support to the claim that target-specific message and interventions are needed if one hopes to significantly change layered stigmatizing attitudes towards PLWHA, especially those who belong to socially marginalized groups.

These results are pertinent to many HIV stigma interventions, but they are perhaps most obviously important for the setting in which the marginalized groups that embody the risk factors for the transmission of HIV are particularly stigmatized (Reidpath and Chan, 2005). It is critical that comprehensive, multi-faceted interventions will need to have an understanding of not only the levels of sympathy by target group, but equally important, the variation in the layered stigma by target group as well. This type of comprehensive approach may be more effective than current efforts in promoting a positive social environment for those living with or affected by HIV. Stigma impacts beyond the individual infected with HIV, to affect all those associated with the diseases. It can also impact on society more generally by extending the epidemic and undermining whatever behavior and treatment interventions are already in place. Thus, the interventions need to be introduced to reduce stigma and encourage acceptance. There are different political and social forces that come to bear when considering

interventions against stigma and there needs to be openness by leadership figures to such issues. Working to reduce or end stigma is also not a short-term undertaking. The popular notion that provision of information is sufficient to change stigma is clearly insufficient (Deacon et al., 2004). The link of information to beliefs and behavior has been shown to be insufficient in changing sexual behaviours in relation to HIV (Skinner and Mfecame, 2012).

There is a clear need for a more established research agenda for stigma related to HIV. An initial priority is the development of a greater understanding of the nature and practice of stigma against HIV-positive people. Stigma is a social phenomenon so that it needs to be understood at both individual and social levels. This work can lay the basis for campaigns and interventions against the practice of discrimination. This is a real and centrally important challenge for harnessing the HIV epidemic that needs to be taken seriously (Skinner and Mfecame, 2012). These findings are important in that they make the field aware that characteristics of the population must be taken into account when assessing negative attitudes or sympathy towards PLWHA. While the majority of the previous research has found that people express more negative attitudes to behaviours they believe are immoral or illegal, this finding is not consistent across the board.

If interventions or programs are to be developed to increase positive attitudes towards PLWHA, then these assumed beliefs are not consistent across certain sub-populations of the population around the world. More in-depth research is warranted to examine the underlying factors associated with holding negative attitudes towards PLWHA and not to just assume that all members of the population hold the same view of immoral or illegal behavior as it is related to HIV/AIDS. Only then can messages be targeted appropriately culturally and hopefully, be more effective in increasing positive attitudes towards PLWHA, irrespective of the target group to which they are associated.

## Conflict of Interest

The authors have not declared any conflict of interest.

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## REFERENCES

Aggleton P, Parker R, Mulawa M (2003). *Stigma, Discrimination and HIV/AIDS in Latin America and the Caribbean*. Washington DC:

- Inter-American Development Bank.  
American Disabilities Act (ADA) (2015). Fighting Discrimination against people with HIV/AIDS. <http://www.ada.gov/aids/index.htm>
- Avert (2015). Stigma and discrimination in the Caribbean. <http://www.avert.org/HIV-AIDS-Caribbean.htm>
- Batson CD, Chang J, Orr R, Rowland J (2002). Empathy, attitudes and action: Can feeling for a member of a stigmatized group motivate one to help the group? *Personal. Soc. Psychol. Bull.* 28:1656-1666.
- Caribbean360 (2014). Caribbean urged to do more to deal with HIV/AIDS stigma, discrimination. <http://www.caribbean360.com/news/Caribbean-urged-to-do-more-to-deal-with-hiv-aids-stigma-discrimination>
- Centers for Disease Control and Prevention (CDC) (1992). Hemophilia Behavioral Intervention Evaluation Project. Atlanta, GA: Behavioral Intervention Research Branch.
- Centers for Disease Control. (CDC) (2015). HIV Surveillance Report. Atlanta, GA: Centers for Disease Control and Prevention.
- Cohen J, Cohen P (1983). Applied multiple regression/correlation analysis for the behavioral sciences. Hillsdale, NJ: Lawrence Erlbaum.
- Colon H, Robles RR, Sahai H (2001). The validity of drug use responses in a household survey in Puerto Rico: Comparison of survey responses of cocaine and heroin use with hair tests. *Int. J. Epidemiol.* 30:1042-49.
- de Bruyn M (1992). Women and AIDS in developing countries. *Soc. Sci. Med.* 34:249-262.
- de Bruyn T (1998). HIV/AIDS and Discrimination: A Discussion Paper - The Experience of Specific Populations. Montreal, CA: Canadian HIV/AIDS Legal Network and Canadian AIDS Society.
- Deacon H, Prosalendis S, Stephney O (2004). Understanding AIDS stigma in social and historical context: A literature review. Paper presented at 2<sup>nd</sup> African Conference on Social Aspects of HIV/AIDS Research Alliance, Cape Town, South Africa.
- Department for International Development (DfID) (2011). Caribbean Operational Plan 2011-2015. <https://www.gov.uk/government/publications/dfid-caribbean-operational-plan-2011-2015-2011-version>
- Ekstrand ML, Bharat S, Ramakrishna J, Heylen E (2012). Blame, symbolic stigma and misconceptions are associated with support for coercive measures in urban India. *AIDS Behav.* 16(3):700-710.
- Fortenberry JD, Martinez J, Rudy BJ, Monte D (2012). Adolescent Trials Network for HIV/AIDS Interventions. Linkage to care for HIV-positive adolescents: a multisite study of eh adolescent medicine trials units of the adolescent trials network. *J. Adolesc. Health* 51(6):551-56.
- Gonzalez-Rivera M, Bauermeister JA (2007). Children's attitudes toward people with AIDS in Puerto Rico: Exploring stigma through drawings and stories. *Qual. Health Res.* 17(2):250-63.
- Hayes RA, Vaughan C, Medeiros T, Dubuque E (2002). Stigma directed toward chronic illness is resistant to change through education and exposure. *Psychol. Rep.* 90:1161-1173.
- Herek GM, Capitanio JP (1999). AIDS stigma and sexual prejudice. *Am. Behav. Scientist* 42(7):1130-47.
- International Center for Research on Women (ICRW) (2002). Understanding HIV-related stigma and resulting discrimination in Sub-Saharan Africa: Emerging themes from early data collection in Ethiopia, Tanzania and Zambia.
- Bisexual, Trans and Intersex Association (2012). State sponsored homophobia: A world survey of laws criminalizing same-sex sexual acts between consenting adults.
- Jamaica Information Service (2012). Ministry seeks to end HIV food stigma. <http://jis.gov.jm/ministry-seeks-to-end-hiv-food-stigma/>
- Jiménez J, Morales M, Castro E, Puig M, Valez CN, Santiago LL, Zorrilla C (2012). Levels of felt stigma among a group of people with HIV in Puerto Rico. *P. R. Health Sci. J.* 31(2):64-70.
- Jiménez J, Puig M, Ramoos JC, Morales M, Asencio G, Salla AC, Castro E., Velez Santori C, Santiago L, Zorrilla C (2010). Measuring HIV felt stigma: A culturally adapted scale targeting PLWHA in Puerto Rico. *AIDS Care* 22(11):1314-22.
- Lau JTF, Tsui H (2005). Discriminatory attitudes toward persons living with HIV/AIDS and associated factors: a population based study in the Chinese general population. *Sex Trans. Inf.* 81(2):113-119.
- Cao X, Sullivan SG, Xu J, Wu Z (2006). The China CIPRA Project 2 Team. Understanding HIV-related stigma and discrimination in a "blameless population." *AIDS Edu. Prev.* 18(6):518-528.
- Malavi-Rivera S, Ortiz-Torres B, Varas-Diaz N (2012). Knowledge of legal rights among persons living with HIV/AIDS in Puerto Rico: Implications for stigma management. *P. R. Health Sci. J.* 31(3):130-137.
- Martinez J, Lemos D, Hosek S (2012). Adolescent Medicine Trials Network. Stressors and sources of support: The perceptions and experiences of newly diagnosed Latino youth living with HIV. *AIDS Patient Care STDs.* 26(5):281-290.
- Ministry of Health (2000). National Knowledge, Attitudes, behaviours and Practices. Kingston, Jamaica: Epidemiol Unit.
- Norman LR, Abreu S, Candelaria E, Sala A (2009). The effect of sympathy on discriminatory attitudes toward persons living with HIV/AIDS in Puerto Rico: A hierarchical analysis of women living in public housing. *AIDS Care* 21(2):140-149.
- Norman LR, Carr R, Jiménez J (2006). Sexual stigma and sympathy: Attitudes toward persons living with HIV in Jamaica. *Cult. Health Sex.* 8(5):423-433.
- Nyblade L, Jain A, Benkirane M, Li L, Lohiniva AL, McLean R, Turan JM, Varas-Diaz N, Cintron-Bou F, Guan J, Kewna Z, Thomas W (2013). A brief, standardized tool for measuring HIV-related stigma among health facility staff: results of field testing in China, Dominica, Egypt, Kenya, Puerto Rico and St. Christopher and Nevis. *J. Int. AIDS Soc.* 16(3 Suppl 2):18718.
- PANCAP You Tube (2012). 10<sup>th</sup> AGM-PANCAP at 10. <https://www.youtube.com/watch?v=8pHvzwQjzDc>
- Parker R, Aggleton P (2000). HIV/AIDS-Related Stigma and Discrimination: A Conceptual Framework and an Agenda for Action. NYC: Population Council.
- Peltzer K, Nzewi E, Mohan K (2004). Attitudes towards HIV-antibody testing and people with AIDS among university students in India, South Africa and the United States. *Indian J. Med. Sci.* 58(3):95-108.
- Puerto Rico Department of Health (2015). HIV/AIDS Surveillance Report. San Juan, Puerto Rico Department of Health.
- Reidpath DD, Chan KY (2005). A method for the quantitative analysis of the layering of HIV-related stigma. *AIDS Care* 17(4):425-432.
- Rivera-Diaz M, Varas-Diaz N, Reyes-Estrada M, Suro B, Coriano D (2012). Socio Structural factors and HIV/AIDS stigma: Experiences from Puerto Rican living with HIV/AIDS accessing health services. *Salud. Soc.* 3(2):180-192.
- Rodriguez MM, Madera SR. Varas Diaz N (2013). Stigma and homophobia: Persistent challenges for HIV prevention among young MSM in Puerto Rico. *Rev. Ciencia Soc.* 26:50-59.
- Rogers SJ, Tureski K, Cushnie A, Brown A, Bailey A, Palmer Q (2014). Layered stigma among health care and social services providers toward key affected populations in Jamaica and the Bahamas. *AIDS Care* 25(5):538-546.
- Ruiz-Torres Y, Cintron-Bou F, Varas-Diaz N (2007). AIDS-related stigma and health professional in Puerto Rico. *Interam. J. Psychol.* 41(1):49-56.
- Rutledge SE, Abe M (2005). Awareness, acceptance, and action: an emerging framework for understanding AIDS stigmatizing attitudes among community leaders in Barbados. *AIDS Patient Care STDs* 19:186-199.
- Skinner D, Mfecame S (2012). Stigma, discrimination and the implications for people living with HIV/AIDS in South Africa. *Sahara J.* 1(3):157-164.
- The Center of HIV Law and Policy (2013). State-by-state chart of HIV specific statutes and prosecutorial tools. <http://www.hivlawandpolicy.org/>.
- The Center of HIV Law and Policy. (2014). Positive Justice Program. <http://www.hivlawandpolicy.org/news/positive-justice-project-highlights-2014>

- The Free Dictionary (2011). Non-normative behaviours. <http://www.thefreedictionary.com/non-normative>
- The Free Dictionary (2011). Normative behaviours. <http://www.thefreedictionary.com/normative>
- The Guardian (2010). HIV fear put repeal of homophobic laws on the table for Caribbean nations. [http://www.theguardian.com/law/2010/dec/01/ Caribbean-gay-rights-laws](http://www.theguardian.com/law/2010/dec/01/Caribbean-gay-rights-laws)
- UNAIDS (2015). Global act Sheet. Geneva, Switzerland: Joint United Nations Programme on HIV/AIDS.
- Varas-Diaz N, Marzin-Rodriguez M (2007). The emotional aspect of AIDS stigma among health professionals in Puerto Rico. *AIDS Care* 19(10):1247-1257.
- Varas-Diaz N, Neilands RB, Cintron-Bou F, Marzin-Rodriguez M, Santos Figueroa A, Santiago -Negron S, Marques D, Rodriguez-Madera S (2013). Testing the efficacy of an HIV stigma reduction intervention with medical students in Puerto Rico: the SPACES project. *J. Int. AIDS Soc.* 16(3 Suppl 2):18670.
- Varas-Diaz N, Neilands TB, Cintron-Bou F, Santos-Figueroa A, Rodriguez-Madera S, Santiago-Negron S (2012). The role of gender on HIV/AIDS stigma among medical students in Puerto Rico: implications for training and service delivery. *P. R. Health Sci. J.* 31(4):220-222.
- Varas-Diaz N, Neilands TB, Guilamo-Ramos V, Cintron-Bou F (2008). Desarrollo de la Escala sobre elstigma relacionado con el VIH/SIDA para profesionales de la salud mediante el uso de maitodos mixtos. *Rev. Puertorriquena Psicol.* 19:183-215.
- Varas-Diaz N, Neilands TB (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.
- Varas-Diaz N, Neilands TB Cintron-Bou F, Santos-Figueroa A, Marzin-Rodriguez M, Marques D (2014). Religion and HIV/AIDS Stigma in Puerto Rico: A cultural challenge for training future physicians. *J. Int. Assoc. Provid. AIDS Care* 13(4):305-308.
- Varas-Diaz N, Rivera SM, Cintron-Bou F (2008). AIDS stigma combinations in a sample of Puerto Rican health professionals: qualitative and quantitative evidence. *P. R. Health Sci. J.* 27(2):147-157.
- Varas-Diaz N, Serrano-Garcia I, Toro-Alfonso J (2005). AIDS-related stigma and social interaction: Puerto Rican living with HIV/AIDS. *Qual. Health Res.* 15(2):169-187.
- Weiss MG Ramakrishna J, Somma D (2006). Health-related stigma: rethinking concepts and interventions. *Psychol. Health Med.* 11(3):277-2787.
- Wikipedia (2015). Public housing in Puerto Rico. [https://en.wikipedia.org/wiki/Public\\_housing\\_in\\_Puerto\\_Rico](https://en.wikipedia.org/wiki/Public_housing_in_Puerto_Rico)
- World Health Organization (WHO) (2000). Definitions of indicators and targets for STI, HIV, and AIDS Surveillance. *STI/HIV/AIDS Surveillance Report* 16:9-11.