

# SUICIDE ATTEMPTS AMONG PUERTO RICAN MEN AND WOMEN WITH HIV/AIDS: A STUDY OF PREVALENCE AND RISK FACTORS

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**Introduction:** Epidemiologic studies in the United States have estimated that 1.1%–4.3% of the general population attempt suicide at some time in their lives, but limited information is available on suicidal attempts within the HIV-positive population after the introduction of effective antiretroviral therapy. In this study, we evaluate the profile and trends of attempted suicide in a sample of HIV patients in Bayamón, Puerto Rico.

**Methods:** A retrospective cohort study design was employed to analyze data from the HIV/AIDS longitudinal data bank generated in the Retrovirus Research Center at the Universidad Central del Caribe, Puerto Rico, from 2000 through 2004. We analyzed cumulative self-reported suicide attempts from 714 individuals. Annual percentage changes were assessed by using general linear model with Poisson distribution. Adjusted odds ratios were estimated by using logistic regression.

**Results:** The prevalence of suicide attempts increased in the five-year period examined, from 9.0% to 22.0%. In our study, men were more likely to attempt suicide than were women. In addition, the risk factors most strongly related to suicide attempts after adjusting for age, sex, HIV/AIDS status at study entry, and injection drug use were stress factors related to filial relationships, use of psychoactive substance, and isolation. Changes in conducts related to depression, confusion and anxiety were positively associated with suicide attempts.

**Conclusions:** Prevention and intervention programs should embrace a more comprehensive approach to care for HIV/AIDS. This approach should recognize the psychological needs and provide the support these patients desperately need. (*Ethn Dis.* 2008;18[Suppl 2]:S2-219–S2-224)

**Key Words:** AIDS, Suicide Attempts, Trends and Risk Factors

## INTRODUCTION

Epidemiologic studies in the United States have estimated that 1.1%–4.3% of the general population attempt suicide at some time in their lives.<sup>1</sup> HIV infection and risky behaviors have been associated with self-harm and suicidal ideation.<sup>2–4</sup> Diagnosis of HIV infection and recognizing a lifelong existence as HIV-positive can be a distressing and traumatic experience. During the last 25 years, the available literature regarding the biological, economic, and social implications of HIV infection has increased, but knowledge of the psychological aspects of living with HIV/AIDS has not been as abundant. The psychological and psychosocial implications of having the infection can be a distressing experience.

In our literature review, limited information was found on recent trends of suicide attempts among persons with HIV/AIDS in the United States or Puerto Rico. Studies completed in 1993 recognized that in the United States, men infected with the virus were 7.4 times more likely to commit suicide than demographically similar men in the general population.<sup>5</sup> In 2002, Heckman et al presented data that suggested that even though the risk of attempted suicide was low in their sample, >35% of HIV-positive individuals had entertained thoughts of suicide.<sup>6</sup> More recent literature states that the risk of suicide in persons with HIV/AIDS is higher than

in the general population.<sup>2</sup> Additionally, some of the drugs used as part of the highly active antiretroviral therapy (HAART) may have side effects that disturb the brain chemistry, leading to psychiatric manifestations, which may aggravate suicidal ideation. Worldwide, the prevalence of psychiatric disorders in HIV-1-positive persons is 4%–18%.<sup>7</sup> The factors that contribute to suicide in persons with HIV/AIDS remain somewhat unclear.<sup>8</sup> In this study, we evaluated the suicide prevalence and possible risk factors for suicide attempts among HIV/AIDS patients that received treatment at the Retrovirus Research Center (RRC) from 2000 through 2004.

## METHODS

A retrospective cohort study design to analyze data from the HIV/AIDS longitudinal data bank from the RRC was used. This data bank includes variables of sociodemographics, lifestyles, risk factors, and psychosocial characteristics of patients with HIV/AIDS who receive therapy in our institution. The methods for data collection have been described previously.<sup>9</sup> The variables related to general characteristics, stress factors, lifestyles, and risk factors were dichotomous (yes/no), except education, which was grouped by educational levels (junior or less, high school, higher education). The variables related to changes in conduct in the last year were created by using ordinal scales from zero (never) to two (frequent). Our dependent variable was self-reported suicide attempt.

We analyzed cumulative self-reported suicide attempts from patients who

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were seen and enrolled in the RRC between from 2000 through 2004. Prevalence odds ratio (OR) of self-reported suicide attempts between sexes was compared, and the association with self-reported suicide attempts and several risk factors related to stress events, change in conduct, and sociodemographics were examined.

To estimate annual percentage change (APC) of self reported suicide attempts, we fit general lineal models with a Poisson distribution. The APC was estimated as follows:  $APC = e^{\beta_t} - 1$ , where  $\beta_t$  specifies the coefficient associated to the time period using the time period from the Poisson regression model  $\mu_i = e^{\beta_0 + \beta_t * t}$ . A possible association between self-reported suicide attempts and several sociodemographic characteristics and risk factors was assessed by using logistic regression models. All regression models were calculated controlling for age, sex, HIV/AIDS status at study entry, and injection drug use (IDU). Data were considered significant at  $P \leq .05$ . All analysis was performed by using SPSS version 14.0 (SPSS Inc., Cary, NC) and Stata version 9.1 (StataCorp LP, College Station, Texas) software.

## RESULTS

### General Characteristics

Our study consisted of 714 HIV/AIDS patients; 67.4% were men and 32.6% were women. Table 1 illustrates the general characteristics of persons with a self-reported suicide attempt. Overall, 126 (17.6%) reported suicide attempts at study entry (17.3% of the men and 18.5% of the women); these patients were an average of 40.17 (standard deviation 9.72) years of age. Patients with self-reported suicide attempts had been diagnosed with HIV at a younger age than their counterparts (32.9 years vs 37.7 years,  $P = .001$ ). They were initially seen in our study site at a younger age than were their counterparts (37.7 years vs 40.7 years,

**Table 1. General characteristics of 717 patients with HIV/AIDS who were treated at the Retrovirus Research Center at the Universidad Central del Caribe, Puerto Rico, 2000–2004**

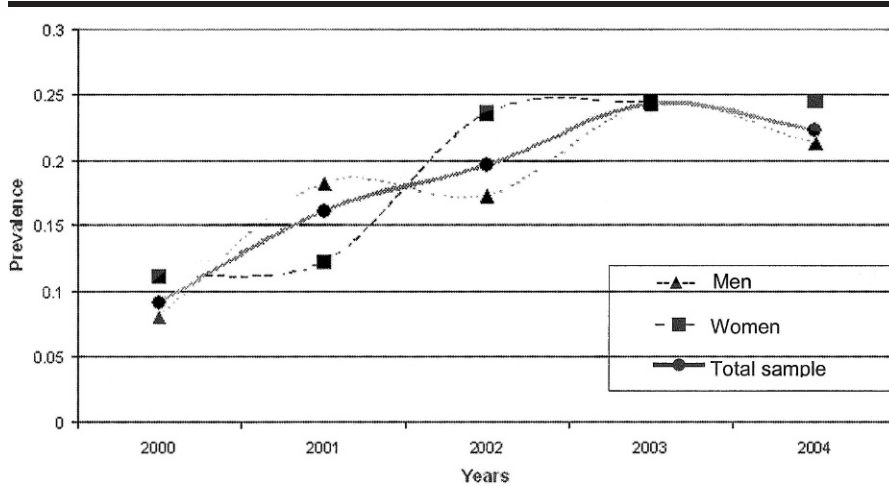
Characteristics*	Suicide Attempt		P value
	Yes n (%)	No n (%)	
Sex			.693
Male	83 (65.9)	398 (67.7)	
Female	43 (34.1)	190 (32.3)	
Average age at study entry	37.71	40.69	.001
Average age at HIV diagnosis	32.97	37.73	<.001
Infection status at study entry			.035
HIV	70 (55.6)	266 (45.2)	
AIDS	56 (44.4)	322 (54.8)	
Mode of exposure to HIV (n=714)			.001
Injection drug use	54 (42.9)	188 (32.0)	
Men who have sex with men	20 (15.9)	98 (16.7)	
Heterosexual	38 (30.2)	274 (46.6)	
Other	14 (11.1)	28 (4.8)	
Use of injection drugs	61 (48.4)	199 (33.8)	.002
Housing (n=714)			.002
Alone	12 (9.5)	64 (1.9)	
With Family	75 (59.5)	421 (71.6)	
Institution	5 (4.0)	21 (3.6)	
Other	33 (26.2)	71 (12.1)	
Homeless	1 (0.8)	11 (1.9)	
Living with partner (n=713)	36 (28.8)	190 (32.2)	.256
Education, last grade completed (n=711)			0.212
Less than or until 9th grade	46 (36.5)	174 (29.7)	
Between 10th and 12th grade	51 (40.5)	238 (4.7)	
Higher education	29 (23.0)	173 (29.6)	
Employment (n=713)			.017
Employed	20 (15.9)	152 (25.9)	
Unemployed	106 (84.1)	435 (74.1)	
Have children (n=709)			.412
Yes	83 (66.4)	365 (62.5)	

\* n's are provided for characteristics with missing data because respondents failed to answer a particular question.

respectively,  $P = .001$ ). The most common mode of HIV exposure among patients with suicide attempts was IDU (42.9%), compared with the other group, in which the main risk was heterosexual sex (46.6%) ( $P = .01$ ). Persons with self-reported suicide attempts arrived at our center with a lower stage of HIV infection. Persons with suicide attempt were more often unemployed, were more likely to not have partners, and tended to have children. Those without suicidal attempts more often lived in a family environment.

### Trends in Self-Reported Suicide Attempts

Trends in self-reported suicide attempts for our sample are shown in Figure 1. The prevalence of self reported suicide attempts increased from 9% in 2000 to 22% in 2004. This difference represents an APC increment of 20.2% in the five-year period studied. Stratifying the event by sex, we recognized that women had a greater increase in the prevalence of self-reported suicide attempts than did men, 22.8% vs 17.3%, respectively.



**Fig 1.** Prevalence of self reported suicide attempts at study entry in the Retrovirus Research Center.

### Stress Factors in the Last Year

Table 2 presents the distribution of several stress factors that occurred in the 12 months before the interview. Overall, 69% of patients with self-reported suicide attempts experienced at least three stress events related to filial relations, and 42.1% experienced at least one stress event related to aggression; these proportions were greater than in their counterparts ( $P < .001$ ). Additionally, 35% reported at least one economic-related stress event (data not shown). The most common stress factors related to filial relations were major conflict with a close friend or family member followed by death of a close friend or family member (45.2% vs 38.1%, respectively).

Table 3 displays the results of bivariate and multivariate analysis to evaluate possible associations of self-reported suicide attempt and several risk factors. Our data suggests that the following variables were positively associated with self-reported suicide attempt: isolation, constant family fights, use of psychoactive substances, other type of stress event, use of tobacco, antisocial behavior, major conflict with a close friend or family member, death of a close friend or family member, loss of work, sexual aggression, or other type of aggression. On the other hand,

employment reduced the risk of self-reported suicide attempt by 47% (OR .53, 95% confidence interval [CI] .32–.90), and years lived reduced the risk by 4% per year (OR .96, 95% CI .94–.98) (data not shown). Other nonsignificant associations were: alcohol consumption, divorce, major disease in family, change of work conditions, or loss of 20% of income.

### Change in Conduct in the Last Year

Table 3 also shows the results of the bivariate and multivariate analysis of the variables related to changes in conduct during the last year. All variables were positively associated with self-reported suicide attempt, except for changes in food intake. The presence of depression, anxiety, and confusion demonstrated a >10-fold increase in risk of self-reported suicide attempt.

## DISCUSSION

This study examined trends in the prevalence of suicidal attempts among HIV/AIDS patients seen at our institution from 2000 through 2004. Additionally, we elaborate a detailed psychosocial profile of Puerto Rican HIV/AIDS patients with at least one

self-report of suicide attempt. As predicted, the prevalence of suicide attempt in our population increased from 9.0% to 22.0% during the period examined. This increase was higher than expected and represented an APC raise of 20.2%. Women had more suicide attempts than men and a higher APC. These findings are consistent with previous studies that indicate that women are more likely to attempt suicide than men.<sup>1,6</sup> In addition, a study published by Coperman and Simon showed that HIV-positive women, mostly from minority ethnic groups in New York, had a 26% prevalence of suicide attempts.<sup>10</sup> Additional information generated from our APC analysis was a sudden increase in suicide attempts in 2001–2002, particularly in women. We are unsure as to the reason for this increase, but future studies may be designed to address these fluctuations in behavior.

Individuals with HIV diagnosed within the six months before interview were 62% less likely to report a suicide attempt than were those whose diagnosis was more than six months from the interview. We did not assess psychological or clinical symptoms at the time of the suicide attempt, which may have shed light on this issue.

Different studies have tried to understand the complex interrelations between the diagnosis of infection, the onset of symptoms, the psychological impact, and the potential suicidal behavior of patients. Suicidal thoughts or attempts tend to manifest when patients feel overwhelmed and their psychological resources seem to fail. To understand those affective scenarios about suicide ideas or intentions, we would need a more accurate and deep interview.

Most patients who reported suicide attempts experienced at least three of the five family related stress events in the year before interview. These filial stressors included divorce, major conflict with a close friend or family

**Table 2. Distribution of stress factors and changes in conduct among 717 patients with HIV/AIDS who were treated at the Retrovirus Research Center at the Universidad Central del Caribe, Puerto Rico, 2000–2004**

	Suicide Attempt		P value
	Yes n (%)	No n (%)	
<b>Lifestyle and risk factors*</b>			
Use of psychoactive substance (n=712)	69 (54.8)	130 (22.2)	<.001
Smoke tobacco (n=714)	106 (84.1)	399 (67.9)	<.001
Alcohol consumption (n=714)	66 (52.4)	289 (49.1)	.510
HIV diagnosis six months before interview (n=714)	35 (27.8)	309 (52.6)	<.001
Isolation (n=714)	104 (82.5)	187 (31.8)	<.001
Antisocial behavior (n=714)	81 (64.3)	184 (31.3)	<.001
<b>Stress Factors in the year before interview</b>			
Stress related to filial relationships			
Divorce (n=714)	9 (7.1)	22 (3.7)	.089
Major conflict with friend or family member (n=714)	57 (45.2)	96 (16.3)	<.001
Death of a friend or family member (n=714)	48 (38.1)	155 (26.4)	.008
Constant family fights (n=713)	20 (15.9)	24 (4.1)	<.001
Major disease in family (n=714)	17 (13.5)	55 (9.4)	.162
<b>Stress related to economics</b>			
Change of work or work conditions (n=670)	9 (8.1)	40 (7.2)	.725
Loss of work (n=669)	29 (26.1)	71 (12.7)	<.001
lost of income >20% (n=713)	29 (23.0)	119 (20.3)	.491
<b>Stress related to aggression</b>			
Sexual aggression (n=714)	9 (7.1)	11 (1.9)	.001
Other type of aggression (n=714)	52 (41.3)	92 (15.6)	<.001
Other stress event (n =713)	113 (89.7)	346 (58.9)	<.001
<b>Changes in conduct in the last year</b>			
Food intake (n=714)			
Decrease	83 (65.9)	306 (52.0)	.007
Stable	36 (28.6)	257 (43.7)	
Increase	7 (5.6)	25 (4.3)	
Difficulty sleeping (n=714)			
Never	21 (16.7)	216 (36.7)	<.001
Sometimes	72 (57.1)	257 (43.7)	
Frequently	33 (26.2)	115 (19.6)	
Episodes of depression (n=714)			
Never	5 (4.0)	181 (30.8)	<.001
Sometimes	60 (47.6)	257 (43.7)	
Frequently	61 (48.4)	150 (25.5)	
Episodes of excitation (n=714)			
Never	77 (61.1)	519 (88.3)	<.001
Sometimes	29 (23.0)	46 (8.2)	
Frequently	20 (15.9)	21 (3.6)	
Episodes of anxiety (n=714)			
Never	7 (5.6)	196 (33.3)	<.001
Sometimes	72 (57.1)	272 (46.3)	
Frequently	47 (37.3)	120 (20.4)	
Episodes of confusion (n=714)			
Never	22 (17.5)	296 (50.3)	<.001
Sometimes	82 (65.1)	267 (45.4)	
Frequently	22 (17.5)	25 (4.3)	
Episodes of impulsivity (n=714)			
Never	29 (23.0)	309 (52.6)	<.001
Sometimes	67 (53.2)	238 (40.5)	
Frequently	30 (23.8)	41 (7.0)	

\* n's are provided for characteristics with missing data because respondents failed to answer a particular question.

member, death of a close friend or family member, constant family fights, or a major illness in the family. Filial stress factors are more associated with self-reported suicide attempts than are economics and aggression stress factors. Such findings suggest that Puerto Ricans living in Puerto Rico with HIV/AIDS have difficulties with their filial relations and that such difficulties contribute to the decision to attempt suicide. These data are of particular interest because most individuals who reported a suicide attempt also reported living with their families.

As seen in our study, mental illness and drug abuse significantly increase the risk of suicide attempts. Our study is consistent with earlier studies that suggest that IDU, isolation, and antisocial behavior are associated with a 10-fold increase in suicide attempts.<sup>2</sup> Self-perceived changes in conduct related to depression episodes, excitation, anxiety, confusion, difficulty sleeping, and impulsivity are associated with suicide attempts among our sample of HIV/AIDS patients. Motherhood was non-significantly associated with a 36% increase in suicide attempts in our study (data not shown). This finding is not supported by other studies.<sup>10</sup> Motherhood implies the assumption of new responsibilities and changes. It also implies the need to cope with the day-to-day challenges, and HIV/AIDS patients may have difficulty in coping with the responsibility of their children in situations characterized by illness, poverty, and stress.

This study has several limitations. We didn't measure some psychological variables like depression, confusion, anxiety, and excitation with a validated psychological instrument capable of making a more accurate diagnosis. We gather such information based on self-perception by using a self-administered questionnaire. Consequently, this information must be interpreted strictly as self-perception. In addition, we did not take into consideration the HIV/AIDS

**Table 3. Odds ratios (OR) and 95% confidence intervals (CI) for suicide attempt by several stress factors and changes in conduct among 717 patients with HIV/AIDS who were treated at the Retrovirus Research Center at the Universidad Central del Caribe, Puerto Rico, 2000–2004**

	Unadjusted		Adjusted		
	OR	CI	OR*	CI*	
<b>Lifestyle and risk factors</b>					
Use of psychoactive substances	4.24	(2.84–6.34)	4.67	(3.05–7.15)	
Smoke tobacco	2.51	(1.51–4.17)	2.16	(1.25–3.72)	
Alcohol consumption	1.13	(.77–1.67)	1.21	(.81–1.81)	
HIV diagnosis six months before interview	.34	(.22–.52)	.38	(.25–.60)	
Isolation	10.13	(6.20–16.57)	9.81	(5.97–16.12)	
Antisocial behavior	3.95	(2.63–5.91)	3.87	(2.42–6.20)	
<b>Stress factors in the year before interview</b>					
<b>Stress related to filial relations</b>					
Divorce	1.97	(.88–4.40)	1.93	(.86–4.33)	
Major conflict with friend or family member	4.23	(2.80–6.40)	4.05	(2.64–6.22)	
Death of a friend or family member	1.71	(1.14–2.57)	1.84	(1.22–2.80)	
Constant family fights	4.42	(2.36–8.29)	4.44	(2.32–8.50)	
Major disease in family	1.51	(.84–2.70)	1.83	(1.01–3.35)	
<b>Stress related to economics</b>					
Change of work or work conditions	1.14	(.53–2.43)	1.34	(.62–2.98)	
Loss of work	2.42	(1.48–3.96)	2.83	(1.68–4.76)	
Lost of income of 20%	1.17	(.74–1.86)	1.2	(.40–1.98)	
<b>Stress related to aggressions</b>					
Sexual aggression	4.03	(1.63–9.95)	3.73	(1.46–9.51)	
Other type of aggression	3.78	(2.49–5.75)	3.33	(2.16–5.12)	
<b>Other stress events</b>	6.05	(3.33–11.00)	6.73	(3.66–12.394)	
<b>Changes in conducts in the last year</b>					
Food intake	Decrease	—	—	—	
	Stable	.51	(.33–.78)	.51	(.33–.80)
	Increase	1.03	(.43–2.47)	.9	(.36–2.20)
Difficulty sleeping	Never	—	—	—	
	Sometimes	2.88	(1.71–4.84)	2.94	(1.73–5.00)
	Frequently	2.95	(1.63–5.33)	3.07	(1.64–5.74)
Episode of depression	Never	—	—	—	
	Sometimes	8.45	(3.32–21.46)	8.8	(3.44–22.50)
	Frequently	14.72	(5.76–37.57)	15.39	(5.95–39.62)
Episode of excitation	Never	—	—	—	
	Sometimes	4.07	(2.42–6.84)	4.16	(2.43–7.11)
	Frequently	6.41	(3.32–12.38)	7.17	(3.63–14.16)
Episode of anxiety	Never	—	—	—	
	Sometimes	7.41	(3.33–16.45)	7.45	(3.33–16.63)
	Frequently	1.96	(4.80–25.04)	1.82	(4.68–25.00)
Episode of confusion	Never	—	—	—	
	Sometimes	4.13	(2.50–6.80)	4.09	(2.46–6.79)
	Frequently	11.84	(5.77–24.28)	11.9	(5.70–24.83)
Episode of impulsivity	Never	—	—	—	
	Sometimes	2.99	(1.87–4.78)	2.87	(1.78–4.83)
	Frequently	7.79	(4.25–14.28)	6.12	(3.71–12.802)

\* Adjusted by age, sex, intravenous drug use, and HIV/AIDS status at study entry.

drug therapy at the time of the suicide attempt or at the time of the interview. The role that HAART therapy plays in suicidal ideations and attempts is unclear and unknown. Despite these limitations,

the results of this study provide valuable information that can support the development of new suicide prevention and intervention programs directed at the Puerto Rican HIV/AIDS patients. In

addition, these studies address the special need of Puerto Rican HIV/AIDS patients to receive a more comprehensive diagnostic and therapeutic program, which may assist them from a psychological perspective. The patterns of HIV adaptation in Puerto Rican patients need to be assessed as they may be predictors of suicide risk.

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