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**Estimating Variation in the Incidence of Violence Against Women in Region XI**

by

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# Estimating Variation in the Incidence of Violence Against Women in Region XI by

Jane Celeres Maratas and Tina Tan-Cruz<sup>1</sup>

## ABSTRACT

This study is on the incidence of violence against women in Region XI. Using the probit model analysis, the probability of a woman that experienced violence within the last 3 years was obtained. Data were gathered from the different provinces of Region XI using stratified random sampling. This study used primary data from interviews with the victims, and secondary data from the non-government organizations and police stations. Results showed that the woman's level of education, school leaving age, age and marital status have significant impact on the risk of experiencing violence within the last 3 years. Probabilities associated with the risk of experiencing violence are likewise presented.

## I. Introduction

Women of the new generation are becoming competitive. Gradually, they have gained a niche in the economy. Higher levels of women's education and greater decision-making power are highly correlated with positive outcomes at the individual, family and overall community level. These and other factors enable women to have greater participation in the labor force (UN Gender Strategy Framework in the Philippines, 2005-2006).

Women, while making up the bulk of the population, have also been identified as one of the marginalized sectors in the Philippine society. Efforts to mainstream them into the development arena, while substantial in form, have yet to make an impact in their transformation into a productive and empowered human resource (Philippine Encyclopedia of Social Work, 2000). Despite the relatively better standing of Filipino women compared to their counterparts in other parts of the globe, violence against them continues to be a universal problem.

Violence against women is defined by the United Nations Commission on the Status of Women as *any act of gender-based violence that results, or is likely to result, in physical, sexual or psychological harm or suffering to women including threats of such acts as coercion, or arbitrary deprivation of liberty, whether occurring in public or private life* (NCRFW, 1995).

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Presently, the incidence of violence remains to be of great concern. In Region XI most of the victims of violence against women were young. Sixty-four percent (64%) were within the age bracket of 18 to 35 years. There were fewer victims of aged 56 and above. In Region XI, Davao City has the most number of victims of violence against women in all age brackets while Davao Oriental has the least number of victims (Turingan *et al.*, 2005). Shown in Table 1 are the reported cases of violence in 2004 by province/city.

Table 1. Number of reported cases of VAW by Province/City in Region XI: 2004-2005.

CASE	PROVINCE/CITY					TOTAL
	Davao Oriental	Davao del Norte	ComVal	Davao del Sur	Davao City	
Total	38	85	63	68	411	665
Rape	5	11	32	14	32	94
Physical Injuries	25	54	8	20	140	247
RA 9262 <sup>a</sup>	2	2	7	20	184	215
Acts of Lasciviousness	1	3	5	3	13	25
Attempted Rape	1	3	4	5	3	16
Concubinage	0	0	1	1	2	4
Abduction	0	0	0	0	0	0
Sexual Harassment	0	0	0	0	0	0
Theft/Robbery	0	0	0	0	0	0
Homicide/Murder	0	0	0	0	0	0
Others <sup>b/</sup>	4	12	6	5	37	64

Note: a/ Anti-Violence Against Women and Their Children Act of 2004

Source: Turingan, E.R. et al. 2005. "Women and Men in Davao Region 2005", NSCB.

b/

incest, sex trafficking, illegal recruitment, abandonment, threat

In the last two decades, efforts to reduce the incidence of violence have resulted in a growing literature on the prevalence of correlates of violence against women with different personal and socio-economic characteristics (O'Donnell, Smith and Madison, 1999). This study is patterned after such study, but on a smaller scale.

## **Objectives**

The main objective of the study is to estimate variation in the incidence of violence against women using some individual attributes. The study is focused in Region XI only. Specifically it aims:

1. To present a profile of victims of violence in Region XI.
2. To explain variations in the incidence of violence against women in Region XI using certain attributes, assigning a binary variable to each of the attributes.

## **II. Data and Model Specification**

### **2.1 Data**

The study made use of primary and secondary data gathered from Region XI government and non-government organizations concerned with the welfare of women. Primary data collection was done through interviews of victims, through the help of government and non-government organizations in charge of VAW victims. A sample of 334 respondents was taken, using stratified random sampling. Secondary data gathered from the government and non-government organizations were from 2002 to 2005. Focus was on women who, in one way or another, had experienced one form of violence for the last three (3) years.

The survey used three strata: the first stratum represents the abused women in Davao City ; the second, the abused women of Davao del Norte; and the third, the abused women of Compostela Valley. A list of possible respondents was obtained from the police precincts, DSWD, New Corella, Davao Medical Center Women and Childrens Protection Unit (WCPU), and Women and Children's Concern Section (WCCS), Police Regional Office and selected non-government organizations like Bathaluman Crisis Center, and Talikala Inc. (LAWIG BUBAI).

### **2.2 The Statistical Model**

The probit model was used in this study. For binary dependent variables estimation, there are two most popular models, and these are: probit and logit. The choice between the two is usually made arbitrarily, although one theoretical justification for the probit model is that if there are many independent factors determining the random threshold level for each individual variable, the central limit theorem can be used to show that this threshold level

(usually unobserved) is normally distributed (O'Donnell, Smith and Madison, 1999). The choice for probit analysis for this study rests on this justification.

Probit models are often motivated in a latent variable framework. In the present context this latent variable framework leads us to assume the existence of an unobservable index,  $Z_i$ , which measures the risk of violence faced by woman  $i$ . The value of this index is assumed to be a linear function of a set of explanatory variables, i.e.,

$$Z_i = \mathbf{X}_i \boldsymbol{\beta} \quad i = 1, \dots, N \quad (1)$$

where  $\boldsymbol{\beta} = (\beta_0, \beta_1, \dots, \beta_{K-1})'$  is a  $K \times 1$  vector of unknown parameters to be estimated,  $\mathbf{X}_i$  is an associated  $N \times K$  vector of observed nonstochastic explanatory variables measuring the attributes of woman  $i$ , and  $N$  is the number of observations. The elements of  $\boldsymbol{\beta}$  cannot be estimated by applying standard linear regression techniques to equation (1) because the dependent variable,  $Z_i$  is unobserved. Hence, our data includes the observed variable  $Y_i$ , a coded variable which takes the value  $Y_i = 1$  if woman  $i$  has experienced violence during the last 3 years, and  $Y_i = 0$ , otherwise. O'Donnell *et al.* (1999) formalized this idea as follows:

$$Y_i = \begin{cases} 1 & \text{if } Z_i > ?_i \\ 0, & \text{otherwise} \end{cases} \quad (2)$$

where  $?_i$  is an unobserved random threshold level.

### 2.2.1 Estimation

Following are the explanatory variables included, grouped by clusters:

Cluster 1 (level of education)

$X_{1,1} = 1$  if woman has finished a bachelor degree; 0 otherwise

$X_{1,2} = 1$  if woman is undergraduate; 0 otherwise

$X_{1,3} = 1$  if woman is a high school graduate; 0 otherwise

$X_{1,4} = 1$  if high school level; 0 otherwise

$X_{1,5} = 1$  if elementary graduate; 0 otherwise

Cluster 2 (school-leaving age)

$X_{2,1} = 1$  if left school at age below 12; 0 otherwise

$X_{2,2} = 1$  if left school at age 12-18; 0 otherwise

$X_{2,3} = 1$  if left school at age above 18; 0 otherwise

Cluster 3 (employment status)

$X_{3,1} = 1$  if employed; 0 otherwise

$X_{3,2} = 1$  if unemployed; 0 otherwise

Cluster 4 (ethnic origin)

$X_{4,1}$  = 1 if woman has Visayan lineage (Cebuano, Ilongo, Leyteño, etc.);  
0 otherwise

$X_{4,2}$  = 1 if woman has Luzon lineage (Ilocano, Bicolano, Tagalog, etc.);  
0 otherwise

#### Cluster 5 (age)

$X_{5,1}$  = 1 if woman's age between 18-25; 0 otherwise

$X_{5,2}$  = 1 if woman's age between 26-34; 0 otherwise

$X_{5,3}$  = 1 if woman's age between 35-44; 0 otherwise

$X_{5,4}$  = 1 if woman's age 45 above; 0 otherwise

#### Cluster 6 (marital status)

$X_{6,1}$  = 1 if single; 0 otherwise

$X_{6,2}$  = 1 if married/live-in; 0 otherwise

$X_{6,3}$  = 1 if married and has children aged above 2 years old;  
0 otherwise

Each observation in the data set is a record of the incidence of violence against, and the attributes of a particular woman, i.e., for each  $X_{jk}$ , the index  $j$  refers to the cluster of variables relating to a particular individual attribute (cluster) and the index  $k$  refers to a particular variable within that cluster. Thus,  $X_{1,4}$  relates to an observation in the first cluster (relating to level of education) for a woman who is a high school graduate.

As a starting point, a benchmark was taken, by considering those characteristics of a woman, which are most frequently observed in the sample. The benchmark then takes the place of the threshold level in equation (2), given a certain attribute. The model  $Z_i = X_i\beta$  is estimated using the 6 clusters, that is  $Z_i$  is the unobservable index, which measures the risk of violence, faced by woman  $i$ . The slope coefficients  $\beta$  is interpreted as estimates of the effects of the cluster on the risk of experiencing violence.

The expression becomes:

$$Z = \beta_0 + \beta_1 X_{1,1} + \beta_2 X_{1,2} + \beta_3 X_{1,3} + \beta_4 X_{1,4} + \beta_5 X_{1,5} + \beta_6 X_{2,1} + \beta_7 X_{2,2} + \beta_8 X_{2,3} + \beta_9 X_{3,1} + \beta_{10} X_{3,2} + \beta_{11} X_{4,1} + \beta_{12} X_{4,2} + \beta_{13} X_{5,1} + \beta_{14} X_{5,2} + \beta_{15} X_{5,3} + \beta_{17} X_{6,1} + \beta_{18} X_{6,2} + \beta_{19} X_{6,3} + e \quad (4)$$

An illustration, a negative (positive)  $\beta_2$  estimate implies that the risk of experiencing violence is lower (higher) for a woman who has all the characteristics of the benchmark except that she is an undergraduate

### III. Results and Discussion

#### A) Profiling of Respondents

Table 1. Socio-demographic profile of respondents

<b>Attribute</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Religion</b>		
Roman Catholic	324	97.0
Others	10	3.0
<b>Residence</b>		
Davao City	301	90.1
Davao del Norte	30	9.0
Compostela Valley	3	0.9
<b>Organization/Office where VAW was reported</b>		
NGOs	219	65.6
Police Station	115	34.4
<b>Employment Status</b>		
Employed	166	49.7
Unemployed	168	50.3
<b>Ethnic Origin</b>		
Visayan lineage	312	93.4
Luzon lineage	22	6.6
<b>Marital Status</b>		
Single	99	29.6
Married/de facto	60	18.0
Married w/children aged above 2 years & above	111	33.2
de facto w/children aged above 2 years & above	64	19.2

<b>Attribute</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
Below 18	8	2.4
18-25	138	41.3
26-34	90	26.9
35-44	62	18.6
above 44	36	10.8
<b>School – leaving age</b>		
Below 12	29	8.7
12-18	220	65.9
Above 18	85	25.4
<b>Educational Attainment</b>		
None	10	3.0
Finished a	49	14.7
Bachelor Degree		
Undergraduate	46	13.8
HighSchool	86	25.7
Graduate		30.2
High school	101	7.2
Level	24	5.4
Elementary		
Graduate	18	
Primary level		
<b>Monthly Income</b>		
None	155	46.4
Below 1000	25	7.5
1000-2000	44	13.2
2000-3000	37	11.1
Above 3000	73	21.8

Table 2. Distribution of respondents according to type of abuse experienced in Region XI: 2002-2006.

Type of Abuse	Frequency	Percentage
Involuntary Prostitution	101	30.2
Illegal recruitment	1	0.3
<b>Abused/Battered</b>		
Wife	141	42.2
Domestic Helper	4	1.2
Others(single,de facto)	30	9.0
<b>Sexual Abuse</b>		
Incest	2	0.6
Rape	10	3.0
Attempted Rape	5	1.5
<b>Sexual Harassment</b>	5	1.5
<b>Concubinage</b>	10	3.0
<b>Theft Robbery</b>	3	0.9
<b>Others *</b>	22	6.6

Note: \* abandonment, threat/verbal abuse, mental, economic abuse

Table 3. Explanatory variables used in the probit analysis.

Variable	Coefficient	Frequency	Mean*	Description
$X_{1,1}$	$\beta_1$	46	0.1377	1 if woman has finished a bachelor degree; 0 otherwise
$X_{1,2}$	$\beta_2$	45	0.1347	1 if woman is undergraduate; 0 otherwise
$X_{1,3}$	$\beta_3$	86	0.2574	1 if woman is a high school graduate; 0 otherwise
$X_{1,4}$	$\beta_4$	104	0.3114	1 if high school level; 0 otherwise
$X_{1,5}$	$\beta_5$	23	0.0689	1 if elementary graduate; 0 otherwise
$X_{2,1}$	$\beta_6$	29	0.0868	1 if left school at age below 12; 0 otherwise

$X_{2,2}$	$\beta_7$	213	0.6377	1 if left school at age 12-18; 0 otherwise
$X_{2,3}$	$\beta_8$	82	0.2455	1 if left school at age above 18; 0 otherwise
$X_{3,1}$	$\beta_9$	166	0.4970	1 if employed; 0 otherwise
$X_{3,2}$	$\beta_{10}$	168	0.5030	1 if unemployed; 0 otherwise
$X_{4,1}$	$\beta_{11}$	312	0.9341	1 if woman has Visayan lineage(Ilocano, Bicolano, Leyteño etc.); 0 otherwise
$X_{4,2}$	$\beta_{12}$	21	0.0629	1 If woman has Luzon lineage (Ilocano, Bicolano, Tagalog etc.); 0 otherwise
$X_{5,2}$	$\beta_{13}$	181	0.5419	1 if woman's age between 18-25; 0 otherwise
$X_{5,3}$	$\beta_{14}$	94	0.2814	1 if woman's age between 26-34; 0 otherwise
$X_{5,4}$	$\beta_{15}$	60	0.1796	1 if woman's age between 35-44; 0 otherwise
$X_{6,1}$	$\beta_{16}$	100	0.2994	1 if single; 0 otherwise
$X_{6,2}$	$\beta_{17}$	61	0.1826	1 if married/live-in; 0 otherwise
$X_{6,3}$	$\beta_{18}$	111	0.3323	1 if married and has children aged above 2 years old; 0 otherwise

\* Mean=proportion of cases in the sample

From Table 3, we can see that the most frequently observed variables (those with the greatest proportion or mean per cluster) are those belonging to the following categories:

- (a) High school level (31%)
- (b) Left school at age between 12-18 (64%)
- (c) Unemployed (50%)
- (d) Visayan lineage (93%)
- (e) Aged between 18-25 (54%)
- (f) Married and has children aged above 2 years old (33%)

A woman with categories (a) to (f) comprises the so-called “benchmark” or threshold level.

## B) Parameter Estimates

Table 4. Estimates of parameters using probit analysis

Coefficient	Variable	Estimate	Standard Error
$\beta_0$	Constant	-6.3324	79.53
$\beta_1$	$X_{1,1}$ 1 if woman has finished a bachelor degree; 0 otherwise	-0.5499 **	0.4272
$\beta_2$	$X_{1,2}$ 1 if woman is undergraduate; 0 otherwise	-0.4489	0.4085
$\beta_3$	$X_{1,3}$ 1 if woman is a high school graduate; 0 otherwise	-0.4311	0.3781
$\beta_4$	$X_{1,4}$ 1 if high school level; 0 otherwise	-0.4572	0.3687
$\beta_5$	$X_{1,5}$ 1 if elementary graduate; 0 otherwise	-0.4838	0.4093
$\beta_6$	$X_{2,1}$ 1 if left school at age below 12; 0 otherwise	1.2332**	0.7902
$\beta_7$	$X_{2,2}$ 1 if left school at age 12-18; 0 otherwise	1.1610**	0.8072
$\beta_8$	$X_{2,3}$ 1 if left school at age above 18; 0 otherwise	1.1192**	0.8196
$\beta_9$	$X_{3,1}$ 1 if employed; 0 otherwise	6.1507	79.73
$\beta_{10}$	$X_{3,2}$ 1 if unemployed; 0 otherwise	5.9777	79.53
$\beta_{11}$	$X_{4,1}$ 1 if woman has Visayan lineage(Ilocano, Bicolano, etc.); 0 otherwise	-0.0179	0.2669
$\beta_{12}$	$X_{4,2}$ 1 if woman has Luzon lineage (Ilocano, Bicolano, etc.); 0 otherwise	-0.1528	0.4046

$\beta_{13}$	$X_{5,1}$	1 if woman's age between 18-25; 0 otherwise	-0.9453 **	0.2737
$\beta_{14}$	$X_{5,2}$	1 if woman's age between 26-34; 0 otherwise	-0.3217	0.2593
$\beta_{15}$	$X_{5,3}$	1 if woman's age between 35-44; 0 otherwise	-0.6004 **	0.2765
$\beta_{16}$	$X_{6,1}$	1 if single; 0 otherwise	-0.4635	0.2390
$\beta_{17}$	$X_{6,2}$	1 if married/live-in; 0 otherwise	-0.1105 **	0.2439
$\beta_{18}$	$X_{6,3}$	1 if married and has children aged above 2 years old; 0 otherwise	-0.0622	0.2297

\* statistically significant at 10% level; \*\* statistically significant at 5% level.

The estimates of  $\beta_1$  to  $\beta_5$  in Table 4 are estimates of the effects of educational attainment on the risk of experiencing violence. Only one coefficient in this group,  $\beta_1$  is statistically different from zero at 10% level of significance. The negative coefficient implies that the risk of experiencing violence is lower for a woman who has all the characteristics of the benchmark except that she finished a Bachelor degree.

The estimates of the school-leaving age on the risk of experiencing violence ( $\beta_6$  to  $\beta_8$ ) are significantly different from zero at both 5% and 10% levels of significance. These results imply that woman can be a victim of violence in any form, regardless of her age when she left school.

The estimates of the effects of employment status ( $\beta_9$  to  $\beta_{10}$ ) are not significantly different from zero at 5% and 10% levels. This result is consistent with the findings of the study of O'Donnell, Smith and Madison (1999) where they found there was no significant difference in the risk of domestic assault faced by employed and unemployed women.

The estimate of  $\beta_{13}$  shows the effects of age on the risk of experiencing violence. At 5% and 10% level of significance, these coefficient suggest that the risk of experiencing violence tends to decrease with age, a result which is consistent with the findings of O'Donnell, *et al.* (1999).

The risk of violence,  $Z_i$ , is specified as a linear function of the explanatory variables. The estimates in Table 4 are, in most cases, a measure of the relative impacts of these variables on the risk of violence.

### C) The Probability Estimates

Table 5. Probabilities of experiencing violence within the last 3 years.

Parameter	Variable	Characteristics	Estimate
$\beta_0$		Benchmark	0.01266
$\beta_1$	$X_{1,1}$	1 if woman has finished a bachelor degree; 0 otherwise	0.02912
$\beta_2$	$X_{1,2}$	1 if woman is undergraduate; 0 otherwise	0.03267
$\beta_3$	$X_{1,3}$	1 if woman is a high school graduate; 0 otherwise	0.03332
$\beta_4$	$X_{1,4}$	1 if high school level; 0 otherwise	0.03238
$\beta_5$	$X_{1,5}$	1 if elementary graduate; 0 otherwise	0.03143
$\beta_6$	$X_{2,1}$	1 if left school at age below 12; 0 otherwise	0.08913
$\beta_7$	$X_{2,2}$	1 if left school at age 12-18; 0 otherwise	0.08772
$\beta_8$	$X_{2,3}$	1 if left school at age above 18; 0 otherwise	0.08685
$\beta_9$	$X_{3,1}$	1 if employed; 0 otherwise	0.020751
$\beta_{10}$	$X_{3,2}$	1 if unemployed; 0 otherwise	0.02396
$\beta_{11}$	$X_{4,1}$	1 if woman has Visayan lineage (Ilocano, Bicolano, etc.); 0 otherwise	0.04929
$\beta_{12}$	$X_{4,2}$	1 if woman has Luzon lineage (Ilocano, Bicolano, etc.); 0 otherwise	0.04393

$\beta_{13}$	$X_{5,1}$	1 if woman's age between 18-25; 0 otherwise	0.01722
$\beta_{14}$	$X_{5,2}$	1 if woman's age between 26-34; 0 otherwise	0.03739
$\beta_{15}$	$X_{5,3}$	1 if woman's age between 35-44; 0 otherwise	0.02741
$\beta_{16}$	$X_{6,1}$	1 if single; 0 otherwise	0.03215
$\beta_{17}$	$X_{6,2}$	1 if married/live-in; 0 otherwise	0.04560
$\beta_{18}$	$X_{6,3}$	1 if married and has children aged above 2 years old; 0 otherwise	0.04752

The probability estimates show the chances that the woman with different attributes will have experienced violence in the last 3 years. For example, the chance that the benchmark has experienced violence in the last 3 years, is found by evaluating the cumulative distribution function at  $\beta_0 = -6.3374$ , which is 0.01266 or 1.27%. Then we can change one benchmark characteristic at a time. Hence, when the woman has all the characteristics of the benchmark except that she is an elementary graduate (i.e., when  $X_{1,5} = 1$ ), then the probability that she will have experienced violence in the last 3 years is given as:  $F(\beta_0 + \beta_5) = 0.01266 + 0.03143 = 0.04409$  or 4.4%. We can also use the probability estimates when several dummy variables change at a time. Since the effects of the dummy variable coefficients are additive, we just read off the probabilities associated with the sum of the relevant coefficients.

#### IV. Conclusions

One of the important highlights of the study is that educational attainment and employment status of the woman do not guarantee that she is safe from any violence. The selected variables of the study influenced the probability of the woman to be abused, one way or the other.

If we consider estimates which differ from zero at the 10% level of significance, then the estimates suggest that the most important determinants of the risk of experiencing violence is educational attainment, school-leaving age, age, and marital status.

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