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Clinic Appointment Attendance for  
Sexually Transmitted Infection Examinations among Filipina Sex Workers:  
A Multilevel Analysis

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## ABSTRACT

*Background.* Promoting access and utilization of sexual health services among sex workers to treat curable sexually transmitted infections (STIs) is a popular and well-supported public health measures to reduce HIV and other STIs in the commercial sex context. However, little is known regarding the determinant of sexual health service utilization. This study aims to evaluate putative individual- and contextual-level risk factors which might influence Filipina sex workers (FSWs) attendance to utilize STI service.

*Methods.* Face-to-face interviews were conducted with 1,004 FSWs and their 86 employers. Research staff also collected clinic appointment attendance data. Hierarchical linear modeling was used to estimate the simultaneous effects of individual-level and workplace-level factors.

*Results.* Both individual- and workplace-level characteristics were associated with appointment attendance. Individual characteristics that were found to have significant effects in clinic attendance included occupation, income, length of work, and commercial sex involvement. Location was a workplace characteristic significantly associated with appointment attendance. In addition, the impact of individual-level occupation depends upon characteristics of workplaces.

*Conclusions.* Health service is utilized in some instances contingent upon work context.

**Key Words:** Occupation; Female sex workers; Clinic appointment attendance; Multilevel; the Philippines.

## INTRODUCTION

Female sex workers have been identified as the highest risk group most likely to be infected with HIV in the developing countries [1]. While increasing proportions of these workers in the Asian sex industry are now operating in establishments [2-3], their health behaviors related to sexually transmitted infections (STIs) and HIV have not been widely studied. Their work interacts with work structure between labor and management, a body of work knowledge, time frame, territory, profits/benefits to workers and employers. In addition, the work structure involves relationships between workers, employers, and between the industry and other structure in the community such as police, hotels, health care providers, and legal system. Thus, their health behavior is constructed within workplaces and society.

STI regular screening program is an effective strategy to control STI and reduce HIV in commercial sex context although most research focuses on promoting individual condom use [4]. For instance, this sexual health service successfully sustained low and stable HIV seroprevalence among female sex workers in Senegal [5], Cote d'Ivoire [6], and Benin [7]. Another example is in the Philippines. The government exercises regulatory functions, particularly in the employment of hospitality female workers in entertainment-based establishments. Their main occupations included dancers, massage parlors, and entertainers who are also officially titled as guest relation officers (GROs). According to city health ordinances, these Filipinas are required to routinely attend the Social Hygiene Clinics to undergo a free STI examinations [8].

In order to maintain the effectiveness of screening program, however, individual clinic appointment attendance is essential. This health utilization behavior could be referred to the match between the individual behavior and health care advisor. According to Andersen's Behavioral Model, attendance to the screening program is attributable to predisposing characteristics and external environment [9]. The predisposing characteristics include background demographic factors and individual knowledge, attitudes and beliefs regarding this importance of the desired behavior. For instance, younger age has been found to significantly predict missing clinic appointment [10]. Social structure measures determine the status of a person in the community. Such measures included education and occupation. Previous research on FSWs also found that a certain occupation leads a specific group of sex workers to develop certain health behavior pattern in terms of sexual relationship [10]. Another significant association has been identified between FSW health behavior and financial remuneration for commercial sex involvement [11-12]. Of particular concern is the interaction effect of income and commercial sex engagement on health behavior.

Green and colleagues expanded the Andersen Behavioral Model to include specific reinforcing factors, such as interpersonal communication skills of the health care provider, positive reinforcement from the clinic staff, and social support from family members and friends. Interactions. You can bring in the structural factors such as manager involvement, condom use policy, reinforcement of clinic attendance as examples of reinforcing factors. Enabling factors here refer to the availability and accessibility of the Social Hygiene Clinic, no cost for clinical examinations, prescriptions for treatment (this may be a barrier that can be addressed as not all GRO can afford to purchase the entire regimen of medication).

A growing literature in the HIV/AIDS research emphasizes the environmental influence on individual preventive behavior in the commercial sex context [14-18]. But, past research has rarely investigated the effects of work condition on clinic attendance. Built upon the Andersen's model, we examine individual-level and workplace-level factors, including potential interactions between characteristics of the individual and the environment. We proposed establishment background may affect the likelihood of individuals utilizing sexual health service even though these factors have not been well studied at the area of sex industry. It was hypothesized that the varieties in the implementation of city ordinance may affect individual clinic attendance. Additionally, the number of years a business has been in operation may be essential in developing procedural standards and normative expectancies for enhancing clinic attendance [19].

In this paper, we provide evidence for this missing part of research by using hierarchical linear modeling or multilevel modeling techniques [20-21] to study occupation effect in clinic appointment. Specifically, we examined the relationships of FSWs' characteristics to keeping scheduled clinic appointments, referred to as clinic appointment attendance, within their work context. First, we elaborated the individual-level relationship between occupation effect and clinic appointment attendance by progressively adjusting for other risk factors. Next, we assessed whether clinic appointment attendance varies across socio-geographic contexts. We also determined whether workplace explanatory variables account for variation in clinic appointment attendance. Lastly, we investigated whether the impact of individual-level occupation effect depends upon characteristics of the workplace.

## METHODS

### *Participants*

Face-to-face interviews were conducted with Filipinas working for establishments between October 1994 and May 1995 in four islands (Legaspi, Cebu, Cagayan de Oro and Ilo-Ilo) of the southern Philippines. This study includes only FSWs who are employed at establishments and who have ever had sexual intercourse ( $N = 1,183$ ). Excluded from the current multilevel analysis were also women who were the single worker of an establishment. This procedure yielded to a total of 1,004 women. Among the 1,004 women there were a total of 86 establishments. These clusters ranged in size from 2 to 41. The participants ranged in age from 15 to 54 years (mean age = 23.20 years). They averaged 9 years of education, over two thirds did not live with a regular partner (either boyfriend or husband) but close to 60% had a child. Women working as entertainer or hospitality girl made up 45% of the analytic sample, with dancer and masahista making up the next two largest groups. On average, these women reported their work durations for current workplace were 13 months but half of them worked less than 6 months. The average weekly earnings were 1,202 pesos (\$45.50 USD) with a great range from 40 pesos (\$1.5 USD) to 9,000 pesos (\$340.69 USD). In addition, across four cities we found employers in Ilo-Ilo were more actively communicating with their employees about sexual health issues than those in Cebu and Legaspi. The managers of Ilo-Ilo and Cagayan de Oro establishments also had more positive attitudes for city ordinance than other managers.

### *Data Collection*

The present research analyzed data from part of a large-scale participatory research that primarily surveyed establishment-based sex workers in the southern Philippines [8]. Three data

sets from this large project are used: (1) survey data from FSWs, (2) survey data from FSW's employers, and (3) medical records from Social Hygiene Clinics (SHCs), collected during October 1994 through May 1995. These data sets assess information at both the individual and establishment levels. At the personal level, the data provide information not only on individual behaviors, but also about women's medical history. Thus, the data are uniquely well suited to the goals of the present study. In addition to collecting the information from FSWs, human subject approval was obtained from the Institutional Review Board (IRB) representing the two collaborating universities: the University of California at Los Angeles (UCLA) and University of the Philippines. This dissertation has also been approved by the UCLA IRB for the specific research aims.

### *Measures*

*Clinic appointment attendance.* The outcome behavior was conceptualized by two sources of information. First, a person-weeks ratio is calculated, which refers to the number of clinic appointments attended divided by the number of weeks a FSW was employed in the establishment during the month. FSWs' actual clinic attendance was also obtained from registration cards based on their respective SHC visits [8]. In order to appropriately examine FSWs' appointment attendance, we also calculated the percentage of attended appointment. For instance, FSWs with an infectious STI are not allowed to work until they are cured so they will have fewer scheduled appointments than those FSWs without infection due to sexual inactivity related to their recovery.

Thus, two elements were included in the average appointment attended rate ( $R$ ). We first calculated FSWs' monthly appointment attendance rate,  $r_j$ , which is defined as the actual number of visits for the  $j$ th month divided by number of scheduled visits for the  $j$ th month. Then, according to the information from person-weeks, an index is developed for indicating whether FSWs were active in work or not ( $I_j$ ). If FSWs were active in work for the  $j$ th month,  $I_j$  will be coded as 1; otherwise, coded as 0. Thus, the average appointment attendance rate was computed as,  $R = (\sum r_j * I_j) / \sum I_j$ . Clinic appointment attendance ranged from 0 to 1, in which FSWs who attended all scheduled appointments have the highest appointment adherence to medical regime and received an attendance rate of 1; on the other hand, those who missed all scheduled appointments received attendance rate of 0.

### *Data Analysis*

Statistical analyses were done in SAS [23]. Hierarchical linear models (HLMs) estimating clinic appointment attendance progressively included adjustment in our models, specifically examining significance of individual occupation effects on appointment attendance. First, we only included occupation categories to investigate the association between occupation and outcome behavior. Next, the model added other sex work-related characteristics and socio-demographics characteristics to test for possible confounding of occupation and appointment attendance. Lastly, we included workplace explanatory variables to determine whether establishments accounted for variation in appointment attendance in contexts.

## **RESULTS**

Table 1 shows individual-level characteristics stratified by occupation. The average year of schooling is very similar to the average year for the total sample but other characteristics differ markedly between the occupation groups. For instance, massage parlour women were

oldest among occupation groups. Four-fifths of massage parlour attendants had a child, in comparison to less than two-thirds of other workers and about half of entertainers or dancers. In addition to partner status, over 70% of entertainers and other occupations had no regular partner, followed by 67% of massage parlour attendants and 62% of dancers.

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Inserted Table 1 Here

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Table 2 presents HLM models that sequentially elaborate the relationship between occupation and clinic appointment attendance. The null model (or sometimes called the unconditional random-effects Analysis of Variance model) was estimated with no independent variables, but with random effect components of intercepts at workplace level. The null model serves as a baseline model and estimates the intercept of 0.46 ( $p < 0.0001$ ), which is the average appointment attendance rate across all workplaces and FSWs. We find that the intraclass correlation ( $\rho$ ) is 0.58. That is, almost sixty percent of the variance of appointment attendance rate is at the workplace level. This also tells that there is a fair bit of clustering of appointment attendance rate within workplace. Model 1 adds random slopes for occupation. The  $\beta$  coefficients for entertainer, dancer, and others are significantly negative, indicating that these women attended clinic examinations, on average, less frequent than massage parlour women. In addition, the slope of entertainer is significantly random, meaning that its effect varies significantly across workplaces. The slopes of other occupations are not significantly random and their effects are therefore fixed in subsequent models. Compared to the null model, Model 1 represents a significant improvement in fit.

Model 2 adds other sex work-related characteristics such as weekly wage, commercial sex involvement, lengths of work and their multiplicative interaction terms as a set. As shown, women who had lower wage but did not involve commercial sex tend to attend clinic examinations more frequently than those who had higher wage and involved commercial sex. Moreover, the effect of one is significantly contingent upon the other. This interaction showed that among FSWs who had higher wages and who reported not engaging in commercial sex were particularly likely to attend clinic appointments. In addition, women who worked longer seem to attend clinic examinations more frequently than those who were relatively newly employed. Compared to Model 1, the coefficients for working as an entertainer, dancer, and others shrink by about 10-20%, indicating that some of their effects are redundant with other sex work-related characteristics. Model 2 also represents a significant improvement in fit over Model 1. In Model 3, the influence of sex work-related characteristics is tested by adding socio-demographic variables such as age, education, parity, and partner status. This model basically reveals no appreciable differences from Model 2, and results in no significant improvement in fit over Model 2. Since socio-demographics had no significant association with clinic attendance, these variables were not included into subsequent models.

Model 4 adds main effects of the two workplace-level variables for the workplaces: city and years of business. As shown in Table 2, women working in Cagayan de Oro or Ilo-Ilo cities attended clinic examinations more frequent than these women working in Legaspi city. The coefficients for occupations greatly decrease, indicating that a portion of their previous effects is

explained by workplace-level variables. These variables are hypothesized to account for a moderate portion of the occupation coefficients, compared to Model 2. The entertainer and dancer coefficients have now decreased by about 20%. Other individual-level coefficients remain virtually unchanged, as does the amount of random variation attributed to working as entertainer. Compared to Model 2, Model 4 represents a significant improvement in fit.

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Inserted Table 2 Here

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In Model 5 the cross-level interactions between workplace-level variables and entertainer at the individual-level are included. As shown, there is a significant interaction between working as an entertainer at the individual-level and Cebu city at the workplace-level, indicating that entertainers who work in Cebu city attended clinic examinations much more frequently than non-entertainer women work in other cities. In addition, there is another significant interaction between working as an entertainer at the individual level and number of years the establishment has been in operation at the workplace-level, indicating that entertainer women who are employed at long-established workplaces attended clinic appointments much more frequently than other FSWs employed at newly-established workplaces, whereas there is no effect of years of business on clinic attendance. Coefficients for other explanatory variables in the model remain largely unchanged compared to Model 4.

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Inserted Figures 1 & 2 Here

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## **DISCUSSION**



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Table 1. Sample profile of study population [mean (SD) or percentage]

Explanatory variables	Total	Entertainer	Dancer	Masahista	Other
	<i>N</i> = 1,004	<i>N</i> = 459	<i>N</i> = 282	<i>N</i> = 180	<i>N</i> = 83
<b>Socio-demographics</b>					
Age (years)	23.20 (4.67)	23.23 (4.58)	21.18 (3.01)	26.38 (5.58)	23.01 (3.78)
Education (years)	9.07 (2.16)	9.05 (2.31)	8.87 (1.80)	9.31 (2.13)	9.35 (2.42)
No regular partner (%)	69.22	73.64	62.41	66.67	73.49
Having no child (%)	42.03	46.19	51.06	20.00	36.14
<b>Sex work-related characteristics</b>					
Weekly wage in pesos (%)					
Less than 500	26.20	30.50	16.31	27.22	33.73
500-1,000	20.42	28.76	17.02	5.56	18.07
1,000-1,500	25.20	21.79	31.56	27.22	18.07
1,500+	28.19	18.95	35.11	40.00	30.12
Work duration in months (%)					
Less than 3	30.48	32.90	33.33	16.67	37.35
3-6	24.80	26.80	27.30	16.11	24.10
7-12	24.10	25.05	22.70	25.00	21.69
12+	20.62	15.25	16.67	42.22	16.87
Commercial sex involvement (%)					
No	41.73	55.12	27.66	12.22	79.52
Involved with local clients only	35.36	37.69	31.91	47.22	8.43
Involved with foreign clients	22.91	7.19	40.43	40.56	12.05
Appointment attended (%)	0.50 (0.34)	0.32 (0.33)	0.61 (0.27)	0.77 (0.24)	0.55 (0.24)

Table 2. Results of multilevel modeling of percentage of appointment attended

	$\beta$ (SE)					
	Null model	Model 1	Model 2	Model 3 <sup>†</sup>	Model 4	Model 5
<i>N</i>	1,004	1,004	1,004	1,004	1,004	1,004
<i>Individual-level variables</i>						
Self-identified occupation <sup>a</sup>						
Entertainer		-0.29 (0.05) <sup>***</sup>	-0.26 (0.05) <sup>***</sup>	-0.27 (0.05) <sup>***</sup>	-0.21 (0.05) <sup>***</sup>	-0.28 (0.05) <sup>***</sup>
Dancer		-0.13 (0.04) <sup>**</sup>	-0.11 (0.04) <sup>**</sup>	-0.12 (0.04) <sup>**</sup>	-0.09 (0.04) <sup>*</sup>	-0.09 (0.04) <sup>*</sup>
Other		-0.19 (0.05) <sup>***</sup>	-0.15 (0.05) <sup>**</sup>	-0.16 (0.05) <sup>***</sup>	-0.08 (0.05)	-0.06 (0.05)
Weekly wage in pesos <sup>b</sup>						
500-1,000			-0.06 (0.02) <sup>*</sup>	-0.06 (0.03) <sup>*</sup>	-0.06 (0.03) <sup>*</sup>	-0.06 (0.03) <sup>*</sup>
1,000-1,500			-0.04 (0.03)	-0.05 (0.03)	-0.04 (0.03)	-0.04 (0.03)
1,500+			-0.04 (0.03)	-0.04 (0.03)	-0.05 (0.03)	-0.05 (0.03)
Work duration in months <sup>c</sup>						
3-6			0.04 (0.02)	0.04 (0.02)	0.04 (0.02)	0.03 (0.02)
7-12			0.04 (0.02) <sup>*</sup>	0.04 (0.02) <sup>*</sup>	0.04 (0.02) <sup>*</sup>	0.04 (0.02)
12+			0.07 (0.02) <sup>**</sup>	0.08 (0.02) <sup>**</sup>	0.07 (0.02) <sup>**</sup>	0.07 (0.02) <sup>**</sup>
Commercial sex involvement <sup>d</sup>						
No			-0.07 (0.03) <sup>*</sup>	-0.07 (0.03) <sup>*</sup>	-0.08 (0.03) <sup>*</sup>	-0.08 (0.03) <sup>*</sup>
Involved with foreign clients			0.03 (0.02)	0.03 (0.02)	0.03 (0.02)	0.04 (0.02)
<i>Interaction terms</i>						
No commercial sex x wage 500-1,000			0.10 (0.04) <sup>*</sup>	0.10 (0.04) <sup>*</sup>	0.11 (0.04) <sup>*</sup>	0.10 (0.04) <sup>*</sup>
No commercial sex x wage 1,000-1,500			0.06 (0.04)	0.06 (0.04)	0.07 (0.04)	0.06 (0.04)
No commercial sex x wage 1,500+			0.09 (0.05)	0.09 (0.05)	0.10 (0.04) <sup>*</sup>	0.09 (0.05) <sup>*</sup>
Intercept	0.46 (0.03) <sup>***</sup>	0.69 (0.04) <sup>***</sup>	0.67 (0.04) <sup>***</sup>	0.72 (0.07) <sup>***</sup>	0.54 (0.06) <sup>***</sup>	0.59 (0.06) <sup>***</sup>
<i>Workplace-level variables</i>						
City <sup>e</sup>						
Cebu					0.09 (0.05)	0.04 (0.06)
Cagayan de Oro					0.13 (0.05) <sup>*</sup>	0.08 (0.06)
Ilo-Ilo					0.32 (0.07) <sup>***</sup>	0.28 (0.07) <sup>***</sup>
Years of business					0.003 (0.003)	0.002 (0.003)
<i>Cross-level interaction</i>						
Entertainer x Cebu						0.23 (0.06) <sup>***</sup>
Entertainer x years of business						0.02 (0.01) <sup>*</sup>

Table 2. Results of multilevel modeling of percentage of appointment attended (continued)

	$\beta$ (SE)					
	Null model	Model 1	Model 2	Model 3 <sup>†</sup>	Model 4	Model 5
Random variance component						
$\sigma_e^2$	0.05 (0.002) <sup>***</sup>	0.05 (0.002) <sup>***</sup>	0.05 (0.002) <sup>***</sup>	0.05 (0.002) <sup>***</sup>	0.05 (0.002) <sup>***</sup>	0.05 (0.002) <sup>***</sup>
$\sigma_{u0}^2$	0.07 (0.01) <sup>***</sup>	0.02 (0.01) <sup>***</sup>	0.02 (0.01) <sup>***</sup>	0.02 (0.01) <sup>***</sup>	0.01 (0.005) <sup>*</sup>	0.008 (0.004) <sup>*</sup>
$\sigma_{u1}^2$		0.02 (0.01) <sup>*</sup>	0.02 (0.01) <sup>*</sup>	0.02 (0.01) <sup>*</sup>	0.02 (0.01) <sup>*</sup>	0.02 (0.01) <sup>*</sup>
$\sigma_{u01}$		0.02 (0.005) <sup>***</sup>	0.02 (0.005) <sup>***</sup>	0.02 (0.005) <sup>***</sup>	0.02 (0.004) <sup>***</sup>	0.01 (0.005) <sup>**</sup>
Statistics						
Deviance statistics	57.02	18.52	-4.71	-5.79	-27.51	-40.50
Comparison to previous model						
Chi-square		38.51 <sup>***</sup>	23.23 <sup>*</sup>	1.08	22.80 <sup>***</sup>	12.99 <sup>***</sup>
Degrees of freedom		5	11	4	4	2

\*  $p \leq 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

<sup>a</sup>Reference group: Masahista women; <sup>b</sup>Reference group: less than 500 pesos per week; <sup>c</sup>Reference group: less than 3 months; <sup>d</sup>Reference group: involved with local clients only; <sup>e</sup>Reference group: Legaspi city

<sup>†</sup>Model 3 adjusts socio-demographics (age, level of educational attainment, partner status, and parity) for Model 2.

Figure 1. Effects of individual-level occupation on the association between clinic attendance and

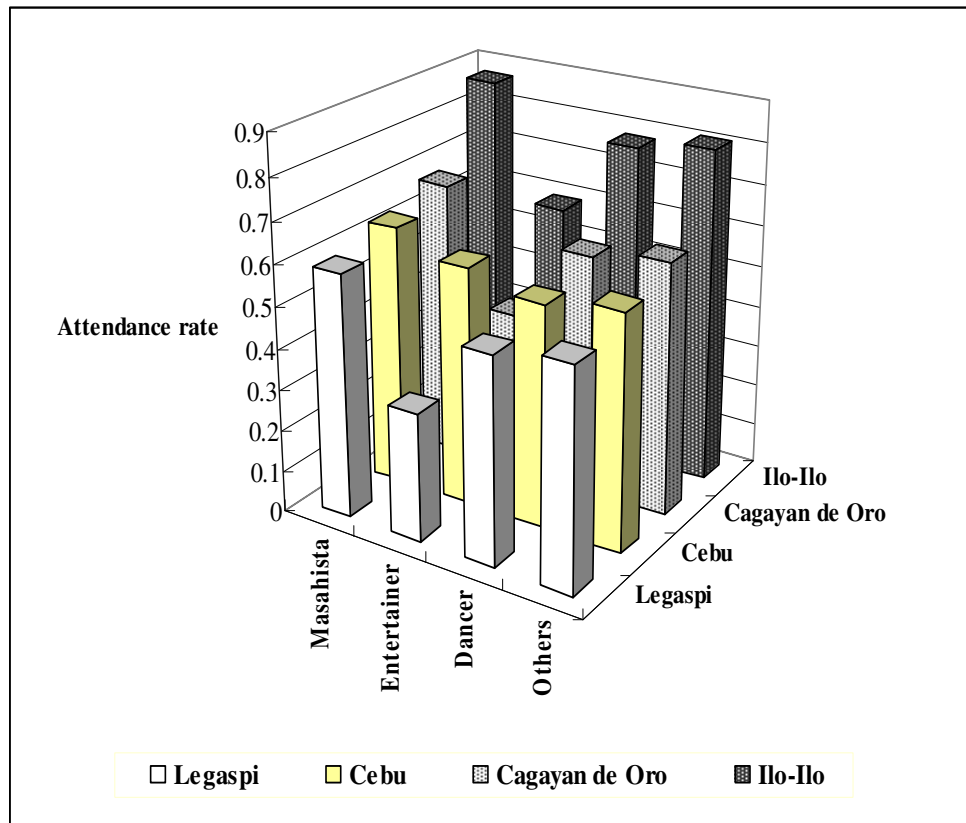


Figure 2. Effects of individual-level occupation on the association between clinic attendance and year of business at the workplace-level

