Family Health International

Enhanced STI Control in Angeles City, Philippines

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TABLE OF CONTENTS

Abbreviations and Acronyms

AIDS	Acquired Immune-deficiency Syndrome
ALKA	The Alliance of Laser Karaokes of Angeles City
BSW	Brothel-based Sex Worker
CT	*Chlamydia trachomatis*
FETPAFI	Field Epidemiology Training Program Alumni Foundation Inc.
FHI	Family Health International
FSW	Freelance Sex Workers
FU	Follow-up
GC	*Neisseria gonorrhea*
GNID	Gram Negative Intracellular Diplococci
GRO	Guest Relations Officer
HIV	Human Immuno-deficiency Virus
JICA	Japan International Cooperative Agency
LACEM	The League of Angeles City Entertainers and Managers
MALKEA	The Metro Angeles Laser Karaoke Entertainers Association
NGO	Non government organization
ONA	Ospital ning Angeles
PATH	Program for Appropriate Technology in Health
PCR	Polymerase Chain Reaction
PNAC	Philippine National AIDS Council
PT	Presumptive Treatment
RA	Research Assistant
RFSW	Registered Female Sex Workers
RSW	Registered Sex Worker
SACCL	STD AIDS Cooperative Central Laboratory
SHC	Social Hygiene Clinic
SSW	Street-based Sex Worker
STI	Sexually Transmitted Infection
SW	Sex Workers
UNAIDS	United Nations AIDS
WBC	White Blood Cells
WHO	World Health Organization

ABSTRACT

Objectives: This intervention-linked research aimed to (1) rapidly reduce the prevalence of common curable STIs in Angeles City and (2) maintain STI reductions over time.

Methodology: A targeted strategy was employed with a single round of azithromycin presumptive treatment (PT) given to all female sex workers (SW) reached during one month. Preventive and curative services for SWs were strengthened as were outreach efforts and peer education for freelance SWs. Cross-sectional measurements of *N.gonorrhoea* and *C. trachomatis* prevalence using urine polymerase chain reaction (PCR) were done prior to PT, one month and six months post-PT, and stratified by type of sex work. Cross-sectional prevalence was also measured among a sample of clients before and after implementation of the interventions.

Results: A total of 1938 SW received PT and 1651 were randomly selected for the assessment surveys during 3 evaluation rounds. PT coverage among those surveyed one month later was 75% for brothel-based (BSW), 63% for street-based (SSW), 50% for registered (RSW) and 79% for guest relations officers (GRO). The prevalence of gonorrhea and/or chlamydial infections at baseline, 1 month post-PT and 6 months post-PT was: brothel-based SW, 52%, 26%, 23%; street-based SW, 41%, 25%, 28%; registered SW, 36%, 26% and 34%; guest relations officers, 22%, 6%, 24%.

The prevalence of gonorrhea and/or chlamydial infections one month after PT declined 50% for BSW, 39% for SSW, 28% for RSW, and 73% for GRO. Six months after PT, prevalence remained 56% lower than baseline for BSW, and 32% lower for SSW, but had returned to baseline levels for the other groups. Factors related to STI decreases at one month included PT coverage, while at six months, access to improved screening services was more important. The prevalence of gonorrhea and/or chlamydial infections among clients of BSW one month post-PT was 28% and declined to 15% six months post-PT.

Conclusion: Significant reductions in prevalence of common curable STIs are possible when effective interventions reach core groups such as sex workers. In

Angeles City, a single round of presumptive antibiotic treatment had a short-term impact on STI prevalence that was proportional to coverage. Longer-term maintenance of STI control requires establishment of effective preventive and curative service.

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INTRODUCTION

Sexually transmitted infections have been implicated as major co-factors in the sexual transmission of HIV. Both ulcerative and non-ulcerative STIs have been associated with HIV in cross-sectional and prospective studies [1-4], with the increased risk ranging from five to ten-fold. In 1993, the World Bank estimated that for persons aged 15 – 44 years, STIs (excluding HIV) were the second cause of life lost in women after pregnancy-related morbidity and mortality.

Interventions for both HIV and STI control seek to change behavior through risk reduction education and condom promotion. Prompt effective treatment of STIs cures individual patients and prevents further spread. Effective STI treatment can shorten the period of infectivity during which an STI can be transmitted to susceptible individuals, thus contributing to both a reduction in STI prevalence, and decreased efficiency of HIV transmission. Researchers from Mwanza, Tanzania [5] demonstrated a 42% decrease in HIV transmission after implementation of a modest intervention to improve management of STIs.

Control of STIs in a community requires more than efficient treatment of STIs in those that present to health services, however. Core groups – such as sex workers and their clients – have a disproportionate effect on the transmission dynamics of STI in a given population. Rates of STI are much higher among core group members and high rates of partner change ensure an adequate supply of susceptibles to maintain STI prevalence within the population. In fact some STIs disappear from communities where the rate of partner change is not sufficiently high, or where control efforts reduce infection rates in core groups [6]. Because of this, STI control efforts that focus on reducing the prevalence of STI in core groups are among the most effective means of lowering STI prevalence in the larger community [7]. Outbreaks of both syphilis [8] and chancroid [9] in North America have been controlled by focused interventions targeting sex workers and their clients.

Targeting core groups is also complementary to partner referral and treatment strategies. The same logic that justifies epidemiologic treatment of sexual contacts can be applied to core groups with high rates of partner change; both

share a high risk of STI infection. However, since STI patients typically refer only their regular partners for treatment [10], casual partners, such as sex workers, rarely receive treatment through referral by index patients.

Several strategies have been employed successfully to decrease STI rates in sex worker populations. Among these are, promotion of condoms [11], STI case finding [12] and presumptive treatment. Case finding is expensive, however, and commonly available methods for identifying STIs in women are neither sensitive nor specific. Presumptive (epidemiologic or selective 'mass') treatment of STIs is an alternative approach [8,13,14] that has been shown to decrease core group STI rates [15] as well as prevalence of certain STIs in the larger community [16-19].

Single dose antibiotics are available for treatment of the common curable STIs (gonococcal and chlamydial infection, chancroid and syphilis [20– 23]).

By definition, however, successful epidemiologic treatment strategies are temporary or emergency measures; as prevalence falls, the epidemiologic justification for the intervention becomes weaker. In order to maintain reduced prevalence levels, other more sustainable control measures, such as primary prevention, improved case management and more effective screening programs must be in place. Research is needed to better define the circumstances where presumptive treatment can be effective as well as the longer-term program elements that can sustain reductions in STI prevalence.

The HIV epidemic in the Philippines remains at low-level with prevalence rates at or below one percent even among groups at highest risk such as sex workers and their clients [24]. The prevalence of other curable STIs, however, is high, particularly among freelance sex workers, and chlamydial infection is prevalent even in the general population [24,25]. In this context, reducing rates of curable STIs is both a priority HIV prevention strategy and a means of reducing other STI-related complications.

Recognizing the importance of STI prevention and control in high-risk settings, many Philippine cities operate social hygiene clinics (SHC) that provide periodic screening of registered sex workers (RSW). Despite weekly screening with

cervical gram stain, however, RSW are consistently found to have high rates of gonorrhea and chlamydial infection [26].

Angeles City is a priority area for STI control and HIV prevention. Of the ten HIV surveillance sites, the highest cumulative number (12) of HIV seropositives has been detected in Angeles City and STI rates are high. Formerly the site of a U.S. military base, there is a large number of sex 'entertainment' establishments that now attract foreign tourists and local patrons as well. There are an estimated 2000-2500 registered and freelance sex workers that operate from both licensed establishments and informal settings including brothels (casas) and on the street. Registered female sex workers (RSW) employed by licensed entertainment establishments receive weekly checkups at the local SHC. Freelance sex workers (FSW), however, have a higher number of clients, lower condom use rates, poor access to services and higher STI prevalence. In a recent study in Angeles City [26], gonorrhea prevalence was 38% among FSW compared to 15% in RSW, syphilis seroprevalence 24% (FSW) compared to 4% (RSW), while chlamydial infection was similar in the two groups (37% vs. 35%); the majority of these infections were asymptomatic.

Although RSW have good access to STI services through the SHC, data on the quality and efficacy of those services are minimal and standardized clinical guidelines for STI screening and treatment are lacking. On the other hand, FSW are not part of the SHC system and generally have poor access to STI care. Access to affordable medicines remains a problem even for women who attend screening. City authorities have advocated a policy of 100% condom use in commercial sex but implementation is just beginning. Outreach and peer education activities are being conducted by the SHC and by NGOs including Reach Out and Pearl S Buck Foundation.

WHO/UNAIDS recommends targeted interventions for vulnerable populations as highly efficient and cost effective especially for countries such as the Philippines with low-level HIV epidemics [UNAIDS 2000]. The Department of Health has prioritized STI control as an HIV prevention strategy.

OBJECTIVES

A. Objectives of the intervention:

1. To rapidly reduce the prevalence of the common curable STIs in Angeles City by providing a single round of presumptive treatment to women at high risk of infection.
2. To maintain reduced prevalence of the common curable STIs through strengthening of existing preventive and curative services.

B. Objectives of the intervention research:

1. To determine the prevalence of gonorrhea and chlamydial infection among female sex workers in Angeles City prior to presumptive treatment, one month following presumptive treatment and again six months later.
2. To determine the prevalence of gonorrhea and chlamydial infection among male clients of female sex workers one month after presumptive treatment and six months later.

METHODOLOGY

The study was conducted in Angeles City, one of the HIV sentinel sites, which reports more than 1% HIV prevalence among female sex workers and men who have sex with men. Findings of the HIV Sentinel Surveillance revealed that Angeles City appears to be the most vulnerable site for increased HIV infection having detected seropositives in more rounds, in more sentinel groups and higher proportion of samples of HIV.

1. Community awareness raising

Peer educators from SHC and several NGOs work with both RSW and FSW to promote preventive practices and encourage use of clinic services. In order to target a broad-based population of female sex workers, the project worked closely with these peer educators to explain the purpose of the intervention and promote participation. These peer educators also emphasized the importance of condom use at all contacts with sex workers. Meetings with brothel owners and managers were also conducted to seek their cooperation in the intervention.

2. Intervention phase – presumptive treatment

All female sex workers in Angeles City were eligible for participation during the presumptive treatment phase.

- Registered sex workers (RSW) were reached through the Social Hygiene Clinic. In the SHC, a designated health care provider approached the registered sex workers during their weekly visit.
- Freelance sex workers (FSW) were contacted and approached by outreach workers together with a health care provider either in unregistered brothels (casas) or in cruising areas. In addition, freelancers who participated in the study were asked to refer other sex workers (snowballing technique).

Study staff explained the objectives of the intervention and the benefits and limitations of presumptive treatment in simple and understandable terms to potential participants who met the criteria (RSW or FSW). It was emphasized that

the treatment was only effective for few specific STIs; that participation in the program was voluntary and was not a substitute for other preventive measures such as condom use; and that they were free to leave at any time. They were also informed that their participation or non-participation would in no way affect the treatment they would receive. Interested and eligible female sex workers were then asked to give witnessed verbal consent. Participants who signified their intention to participate were given a supervised one-gram dose of azithromycin as presumptive treatment, which is effective against gonococcal and chlamydial infections, chancroid and incubating syphilis [20-23]. Treatment for registered sex workers was administered at the Social Hygiene Clinic while freelance sex workers were given treatment at outreach posts and in cruising areas. Any participant with signs or symptoms consistent with vaginitis or genital ulcer received free treatment for these conditions based on the National STD Case Management Guidelines at this initial visit. After the supervised treatment, participants were requested to remain at the treatment centers for observation of possible adverse reaction. Condom use was promoted and participants were encouraged to return for their regular STI screening at the Social Hygiene Clinic or the outpost center.

3. Intervention Assessment

Three cross sectional surveys among high-risk groups (female sex workers 15 years of age and older) were conducted; (1) prior to the giving of presumptive treatment, results of which were used as pre-intervention baseline, (2) one month after presumptive treatment and (3) six months after first assessment survey. Clients aged 18 years and above were included during second and third assessment surveys. The methodology used during a 1999 survey (*Prevalence of Sexually Transmitted Infections among Female Commercial Sex Workers and their Clients and Men who have sex with Men in Angeles City*) was adapted.

3.1 Study Population

Female Sex Workers (SW) are women who exchange sex for favors or money and have had sexual intercourse during the week prior to interview (HSS Manual of Operations 1998). For the purpose of this study, SW were divided into four

categories.

- *Registered female sex workers* (RSW) are SW that are establishment-based and possess a duly signed health certificate issued by the Social Hygiene Clinic (SHC).
- *Guests Relations Officers* (GRO) are women working in karaoke or sing-a-long bars and possess a duly signed health certificate issued by the Ospital ning Angeles (ONA).
- *Street-based Female Sex Workers* (SSW) are SW found in streets, parks, theaters and other cruising areas, unregistered and do not possess a health certificate issued either by the Social Hygiene Clinic or Ospital ning Angeles.
- *Brothel-based Female Sex Workers* (BSW) are SW working in brothels or "casas". They are unregistered and do not possess a health certificate issued by the Social Hygiene Clinic.

Clients of female sex workers are men who have had sex with a female commercial sex worker for a fee or favor within one month prior to the interview.

Exclusion Criteria:

The following criteria excluded individuals from being referred to or participating in the study:

- Female sex workers below 15 years of age, and clients of sex workers below 18 years of age.
- Women and men under the influence of drugs and alcohol.
- Lack of witnessed informed consent.

3.2 Targeted Sample Size

Based on the following assumptions: 95% level of confidence, 80% power, 35% baseline STD prevalence, and an expected 50% reduction in STD prevalence (chlamydial infection in RFSW and FLSW, gonorrhea in FLSW), the minimum calculated sample size for baseline and follow-up assessments was 110. A larger

sample (304) was needed to detect a 50% reduction from 15% gonorrhea prevalence among RFSW. A total of 500 subjects (300 registered female sex workers and 200 freelance sex workers) were recruited during the baseline assessment. These sample sizes were used for the follow-up assessments of sex workers. In addition, 200 clients of commercial sex workers were sampled at the follow-up assessments. Based on experience from the previous survey round, it was not feasible to recruit larger numbers of FLSW or clients.

	Baseline Assessment	1st Assessment	2nd Assessment
RSW	300	300	300
GRO	100	100	100
SSW	100	100	100
BSW	100	100	100
Clients	-	100	100

3.3 Recruitment of subjects

- RSW were randomly recruited from the Social Hygiene Clinic. In order to maintain their registrations, RSW are required to attend the Social Hygiene Clinic on a weekly basis. A study staff approached every fifth sex worker attending the SHC for her routine visit.
- GRO were approached by an outreach worker and a study staff in karaoke bars. Every third qualified GRO was included in study.
- SSW were approached in streets, parks, theater and other cruising areas. In addition, street-based female sex workers who participated in the study were asked to refer other sex workers they know (snowballing technique).
- BSW were recruited in unregistered brothels (casas) and in the outreach post established in the area.
- Clients of SW: Respondents were recruited in unregistered brothels and in night establishments.

Convenience sampling was used until the required sample sizes were attained for SSW, BSW and clients of SW.

4. Data Collection

4.1 Females

If a female sex worker met the inclusion criteria of the study, witnessed informed consent was administered. A study staff explained the purpose and procedures of the study in simple and understandable terms. Potential participants were informed that all information would remain confidential; that participation was voluntary; that they could refuse to answer any questions; and that they could leave at any time. They were also informed that their participation or non-participation in the study would not affect the treatment they would receive. After these were explained, participants who signified their witnessed verbal consent were enrolled in the study.

In a private room, a face-to-face interview was conducted using a standard questionnaire. The questions dealt on the following: sociodemographic profile, duration of sex work, sexual behaviors, number of partners in a week, history of previous STI, presence of STI related symptoms, condom and antibiotic use. Upon completion of the questionnaire, respondents were asked to provide freshly voided urine for detection of *N. gonorrhoeae* and *C. trachomatis* using Polymerase Chain Reaction (PCR). A trained clinic staff then performed the routine genital and speculum examination among RSW and BSW for the presence of genital discharge, ulcers, and warts.

The interview and examination of RSW were conducted at the Social Hygiene Clinic. BSW were interviewed and examined at the outreach post. GRO were interviewed in karaoke bars while SSW were interviewed either in the mobile clinic or in outreach posts.

4.2 Men

Clients of sex workers in the brothel area were asked to participate in the study. If a client of a sex worker met the inclusion criteria, witnessed informed consent

was administered. As with the women subjects, a study staff explained the purpose and procedures of the study. After this, participants who signified their witnessed verbal consent were enrolled in the study.

In a private room a study staff conducted a face-to-face interview using a standard questionnaire. The questions dealt with the following: sociodemographic profile, sexual behavior, number of partners in the past month, history of previous STI, presence of STI related symptoms, condom and antibiotic use. Upon completion of the interview, a trained clinic staff performed a routine genital examination for the presence of genital discharge, ulcers, and warts . After genital examination, each participant was asked to provide freshly voided urine for PCR detection of *N. gonorrhoeae* and *C. trachomatis*.

Interviews and examination of clients of FSWs were done in mobile clinics and outreach post.

All questionnaires and specimens were marked with a study number. No names appeared on the forms and specimens collected. Participants were given a card with their corresponding study number. They were told to return or call after one week for their laboratory results. Any subject with signs and symptoms of STI during the interview and examination received free treatment based on the National STD Case Management Guidelines. Additional treatment was also given based on the laboratory results. The RA also counseled subjects regarding STIs, demonstrated condom skills, provided free condoms and a T-shirt.

4.3 Laboratory Diagnosis

Two endocervical swabs were collected from the participants seen at the Social Hygiene Clinic. The first swab was rolled into a glass slide and stained at the SHC laboratory using MEDIC Gram Stain Kit (Manila, Philippines). The SHC medical technologist then read the slide. The second swab was rolled into another glass slide, air dried and sent to SACCL for staining and validation of Gram Stain reading results of the SHC. In SACCL, the slide was stained using Merck's Gram Color (Germany) and read by 2 junior medical technologists. In case of discordant results, a senior medical technologist was asked to read the slides. Agreement of the reports from SHC and SACCL was analyzed.

Ten to fifteen ml urine samples were collected using sterile polypropylene tubes from all participants of the study. Urine was used for the detection of *Chlamydia trachomatis* and *Neisseria gonorrhea* using polymerase chain reaction. Samples collected were initially stored at 4^0 C before being transported on ice to the Central Laboratory (SACCL) for processing. PCR using Amplicor CT/NG test (Roche Molecular Systems, Branchburg, New Jersey) was performed according to the manufacturer's instruction. PCR testing was done prior to the giving of presumptive treatment, one month post-PT and six months after. Results were then collated and sent to the investigators for data analysis.

5. Data Analysis

Data obtained from the interviews, clinical and laboratory examinations were entered into a computer and analyzed using EpiInfo 6 and Stata, version 6. Prevalence rates were compared using Chi-square for comparison of proportions.

RESULTS

Overview: Results are presented by evaluation round and by category of sex workers and clients as follows:

- Implementation of the intervention research
  - Presumptive treatment (PT) administration
  - Baseline and follow-up data collection
  - Coverage of PT
- Baseline findings of surveyed populations
  - Demographic characteristics
  - Sexual and preventive behaviors
  - STI prevalence
- Changes in STI prevalence over time

Implementation of the intervention research

Administration of presumptive treatment: A total of 1938 female entertainment workers were given presumptive treatment (PT) between February and March 2001. Table 1 describes this population according to categories commonly used in Angeles to distinguish registered from 'freelance' (non-registered) sex workers by place of employment.

Table 1 Number of sex workers given PT by category (n=1938)

Category	Number	Percent of total
Registered Female Sex Workers **(RSW)**	1015	52 %
Guest Relations Officers **(GRO)**	657	34 %
Street-based Female Sex Workers **(SSW)**	135	7 %
Brothel-based Female Sex Workers **(BSW)**	131	7 %
Total	**1938**	**100 %**

Reaching almost 2000 sex workers in different settings over a one-month period required a coordinated effort of the research team, NGO outreach workers and clinic staff. Despite some misunderstanding and initial resistance, most 'entertainment establishments' cooperated with the intervention team to facilitate access to and participation of the women. The managers (*mama sans*) of the brothels were especially involved, organizing schedules for examination and PT visits, which continued on a weekly basis for screening after the PT round was completed.

There were no serious adverse effects from the PT but gastrointestinal side effects (primarily nausea and abdominal discomfort) to azithromycin (1G) were initially common. The PT administration protocol was modified to include a snack to be taken with the medicine; after this, side effects were much less common.

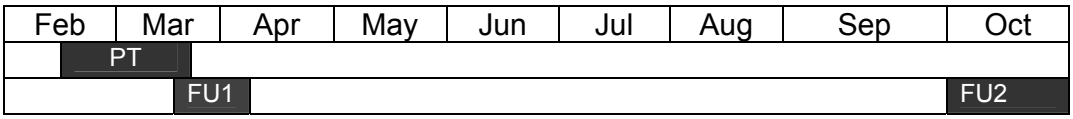
Baseline follow-up data collection: A total of 1,651 woman/visits were included in the three survey rounds (Table 2). Because sampling was done independently at each round, some women were included in more than one round.

Table 2 Number of female sex workers sampled

Category	**Baseline**	**1st FU**	**2nd FU**	**Total**
Registered Female Sex Workers **(RSW)**	204	236	300	740
Guest Relations Officers **(GRO)**	100	100	100	300
Street-based Female Sex Workers **(SSW)**	100	100	100	300
Brothel-based Female Sex Workers **(BSW)**	95	94	122	311
Total	**499**	**530**	**622**	**1651**

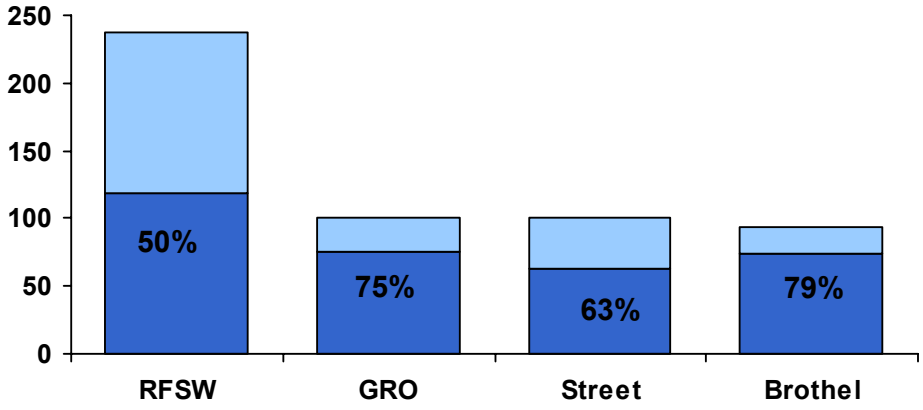
The baseline survey was done at the same time as the PT from Feb 12 to March 20, 2001, the first follow-up assessment (1st FU) from March 12 to April 6 and the second follow-up (2nd FU) from October 15 to 25 (Fig 1). First assessment visits were staggered by group to follow PT by approximately one month.

Figure 1 Schedule of PT and follow-up assessments



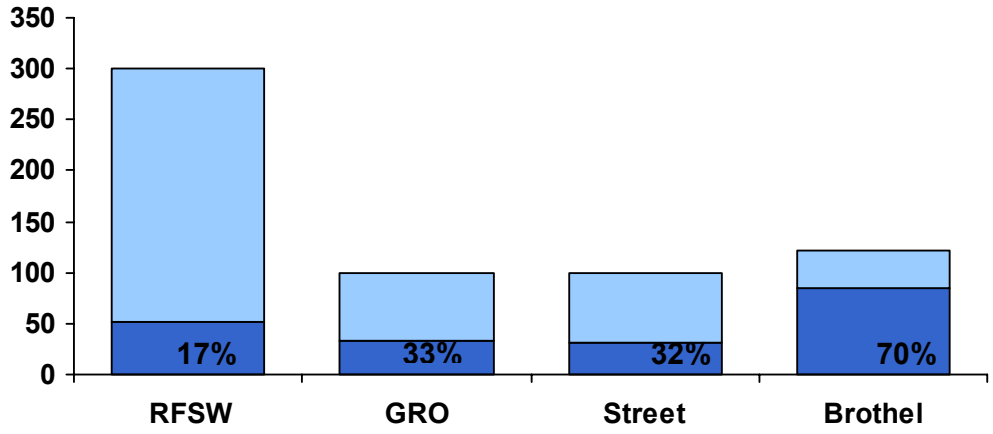
Coverage of PT: PT coverage varied by group as shown in figure 2. The highest coverage was achieved for BSW and GRO and the lowest for RSW. Mobility of the women was cited as an important reason for incomplete coverage – to a variable extent across categories, there are new women coming into the system as well as women leaving for periods of time and returning.

Figure 2 Coverage of PT as measured at first follow-up visit one month later



The importance of mobility and a revolving population of women engaged in sex work in Angeles City is further illustrated by Figure 3 which shows the proportion of women sampled 6 months later who had received PT. These data show that turnover is high but suggest that BSW may be less mobile than the other groups.

Figure 3 Coverage of PT as measured at second follow-up visit six months later



Demographic and behavioral findings at baseline

Demographics: Ages of respondents ranged from 15 to 48 years (median 22). Sixty-two percent (62%) were single and 67% had reached secondary education (Table 3). The women surveyed had been in the entertainment industry for periods ranging from one day to 16 years (median 8 months).

Table 3 Demographic Characteristics of Female Sex Workers (N=1209) Angeles City, Feb - Oct 2001

Socio-demographic Characteristics	Target Groups			
	RSW	**GRO**	**SSW**	**BSW**
Age median (years) Range	22 16 – 41	22 17 – 45	23 16 – 48	20 15 – 44
Marital status				
Single	71%	48%	41%	78%
Live-in	13%	24%	34%	8%
Married	3%	24%	17%	3%
Separated	12%	4%	6%	10%
Widow	2%	1%	2%	1%
Highest Educational Attainment				
Elementary	27%	6%	23%	29%
High School	65%	80%	68%	61%
College	6%	11%	7%	9%
Vocational	2%	2%	1%	1%
No formal education	1%		2%	1%

Sexual and preventive behavior

The number of sexual partners during the week prior to the baseline interview (Table 4) ranged from 1 to 68 (median 1). Brothel-based female sex workers (BSW) had more sex partners during previous week compared to the other groups ($p<0.01$).

Table 4 Numbers and Types of Sex Partners per Week

	Median number of sex partners (range)			
	RSW	**GRO**	**SSW**	**BSW**
All partners	1 (1–15)	1 (1–4)	1 (1–30)	19 (1–68)
Non-regular	1 (0–15)	0 (0–2)	0 (0–25)	14 (0–65)
Regular	0 (0–8)	1 (0–2)	1 (0–5)	3 (0–38)
Paying regular	0 (0–8)	0 (0–1)	0 (0–5)	4 (0–38)
Non-paying regular	0 (0–2)	1 (0–2)	1 (0–2)	0 (0–3)

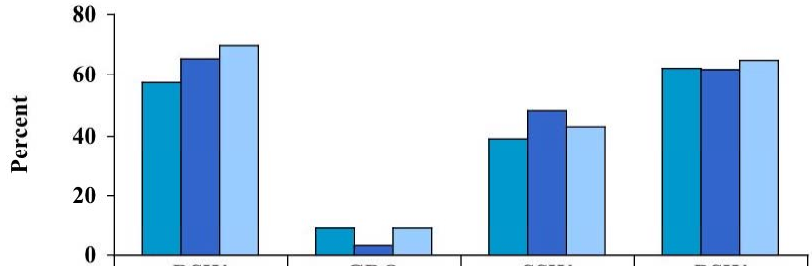
At baseline, half the women (50%) reported using a condom the last time they had sex. However, only 36% said they used a condom every time they had sex (Table 5). The proportion of women who consistently used condoms (Fig 4) was highest among RSW ($p < 0.01$).

Table 5 Condom Use Among Female Sex Workers

	RSW	**GRO**	**SSW**	**BSW**
Condom use every time during last week	57%	6%	27%	26%
Condom use last sex	65%	7%	43%	63%
with paying regular partners	73%	12%	56%	50%
with non-paying regular partners	20%	6%	10%	20%
with non-regular partner	69%	25%	75%	68%

Condom use increased marginally if at all for most groups over the course of the intervention. Condom use at last sex was lowest among GROs.

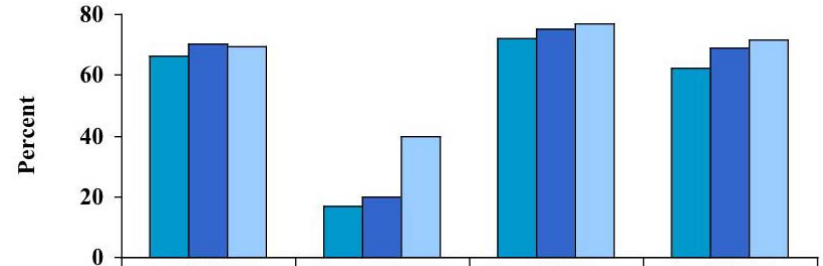
Figure 4 Condom use last sex reported by SW, Angeles City Feb-Oct 2001



	RSW	GRO	SSW	BSW
Baseline	57.4	9.0	39.0	62.1
1st FU	65.3	3.0	48.0	61.7
2nd FU	70.0	9.0	43.0	64.8

Condom use at last sex with non-regular partners was somewhat higher than condom use at last sex with any partner. This reflects lower condom use among regular partners, especially non-paying regular partners.

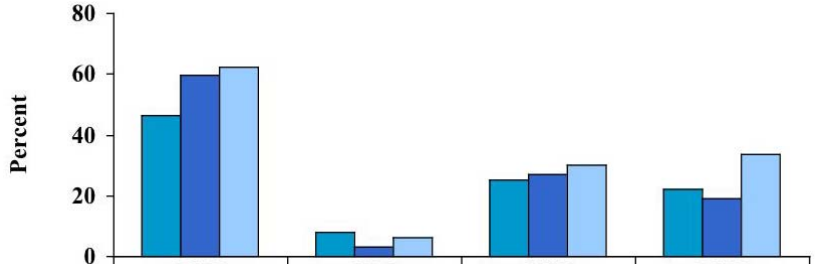
Figure 5 Condom use last sex with nonregular partner reported by SW, Angeles City, Feb-Oct 2001



	RSW	GRO	SSW	BSW
Baseline	66.2	16.7	72.1	62.2
1st FU	70.1	20.0	75.0	69.1
2nd FU	69.6	40.0	76.7	71.7

Consistent condom use every time during last week was less than 50% for all groups except RSW.

Figure 6 Consistent condom use reported by SW, Angeles City Feb-Oct 2001

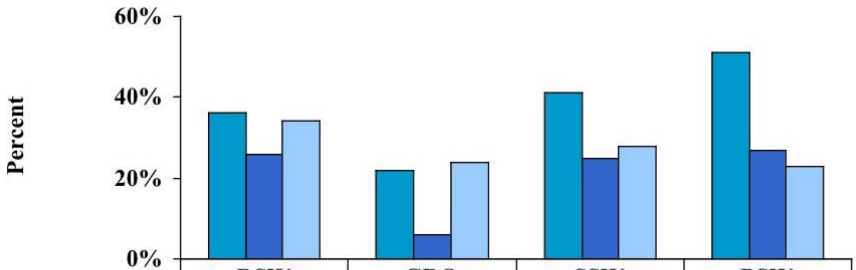


	RSW	GRO	SSW	BSW
Baseline	46.6	8.0	25.0	22.1
1st FU	59.7	3.0	27.0	19.1
2nd FU	62.3	6.0	30.0	33.6

STI prevalence

Figure 7 shows the prevalence of gonorrhea and chlamydial infection among female sex workers during the three survey rounds. At baseline, women with STI were slightly younger (median 21 years) than women without infection (median 22 years, $p<0.01$). They had been in the entertainment industry for a shorter period of time (median 6 months versus 10 months, $p<0.01$). Thirty five percent of all respondents reported to have experienced STI signs and symptoms. Pain in the lower abdomen and frequent urination were the most common sign and symptom. However, no sign or symptom was associated with infection.

Figure 7 Prevalence of gonorrhea and/or chlamydia among SW



	RSW	GRO	SSW	BSW
Baseline	36%	22%	41%	51%
First FU	26%	6%	25%	27%
Second FU	34%	24%	28%	23%

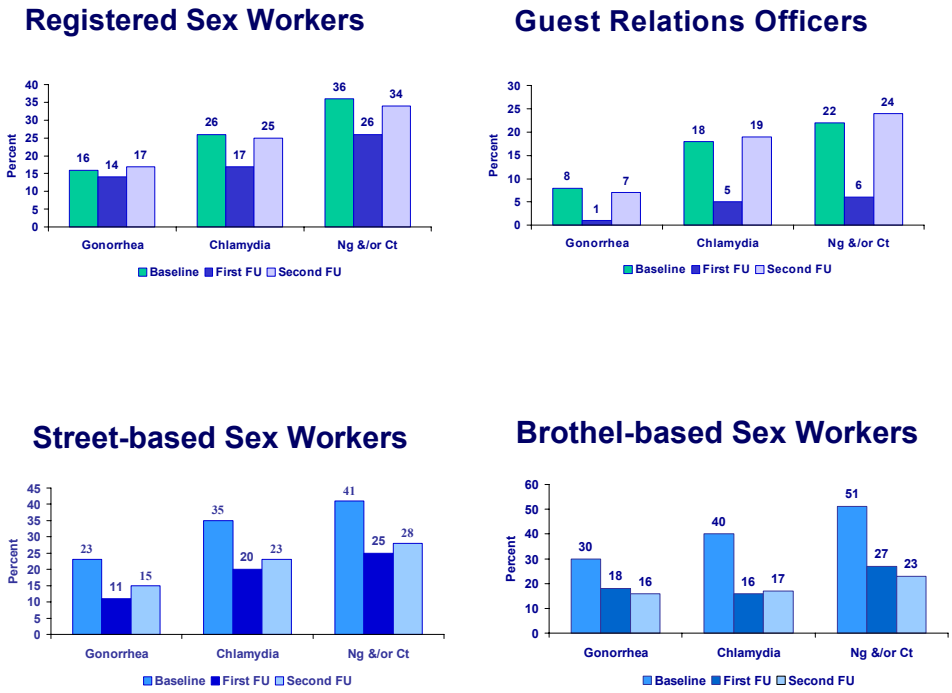
Overall, the reduction in both gonorrhea and chlamydia prevalence from baseline was significant at both first and second follow-up visits. When examined by category of SW, however, the results varied considerably (Table 6).

Table 6 Prevalence of gonorrhea and/or chlamydia among SW

	Baseline (v1)	1st FU V2	Difference v1-2	2nd FU V3	Difference v1-3	Trend
OVERALL						
GC	18.6	11.9	**0.003**	15.0	**0.01**	**0.01**
CT	29.1	15.1	**<0.0001**	22.2	**0.008**	**<0.0001**
RSW						
GC	16%	14%	0.6	17%	0.8	0.7
CT	26%	17%	**0.02**	25%	0.7	**0.03**
GRO						
GC	8%	1%	**0.04**	7%	0.8	0.06
CT	18%	5%	**0.004**	19%	0.9	**0.006**
SSW						
GC	23%	11%	**0.02**	15%	0.15	0.07
CT	35%	20%	**0.02**	23%	0.06	**0.04**
BSW						
GC	30%	18%	**0.046**	16%	**0.01**	**0.03**
CT	40%	16%	**0.0002**	17%	**0.0002**	**<0.0001**

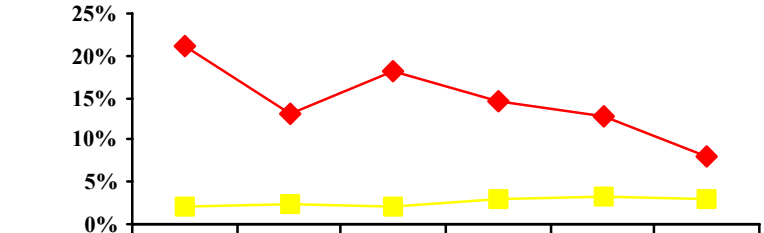
At the first assessment round, prevalence was reduced by 28% for RSW, 73% for GRO, 39% for SSW and 47% for BSW - with the exception of gonorrhea in RSW, all reductions were significant one month after PT. However, at the second assessment round 6 months later, prevalence was maintained at reduced level only among BSW and, to a lesser (borderline significant) extent, SSW (Figure 8).

Figure 8 STI prevalence by type of SW



Limited data on clinical services were collected for RSW and BSW during the six months between the two follow-up visits. Figure 9 shows the proportion of women attending screening visits who received treatment for STI. The more sensitive screening algorithm utilizing both clinical criteria and Gram stain was successfully introduced at the BSW clinic leading to treatment from 8% to 20% of women (Figure 9). At the SHC, by comparison, only 2-3% of women received treatment.

Figure 9 Proportion of screening visits where treatment for Ng/Ct was given



	Apr	May	Jun	Jul	Aug	Sep
BSW	21.0%	13.0%	18.3%	14.7%	12.9%	7.9%
RSW	2.2%	2.4%	2.2%	3.0%	3.3%	2.9%

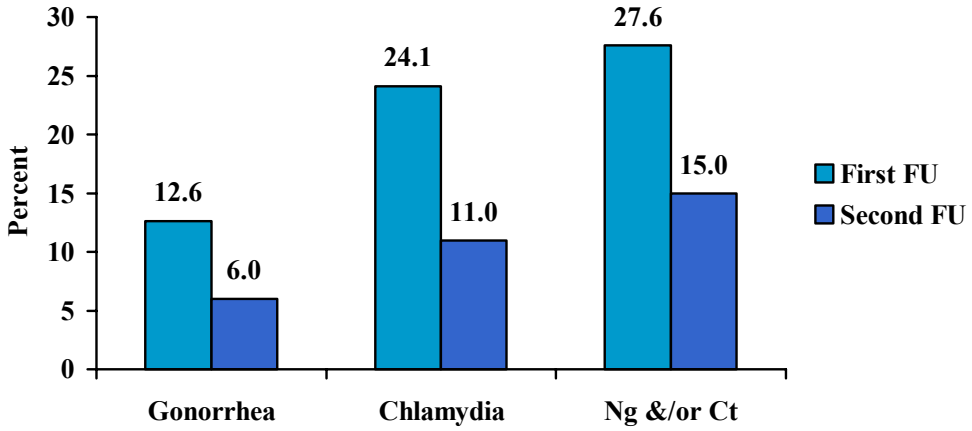
Clients of Female Sex Workers

Two hundred clients of BSW were recruited (100 at the time of the first evaluation round; 100 at the second) in the brothel area. Their ages ranged from 18 to 60 years (median 23). Seventy-one percent were single. Forty-eight percent had reached secondary education. Thirty-three percent had regular partners. Of these, only five percent reported using a condom the last time they had sex with a regular partner, while 22% used a condom the last time with SW.

Pain during urination and urethral discharge were the most common sign and symptom reported. On physical examination, 11 had inguinal lymphadenopathy, five had urethral discharge and three had genital ulcer.

Figure 10 shows the prevalence of chlamydial and gonococcal infection among clients of FSW during the two survey rounds.

Figure 10 Prevalence of STIs among clients of brothel-based SW



DISCUSSION

Effective control of sexually transmitted infections requires interventions that can interrupt transmission, especially among those who are at highest risk of acquiring and transmitting infection. Such interventions include both primary prevention (condom promotion) to prevent infection as well as secondary prevention (effective STI clinical services) to reduce the duration of infectiousness of those already infected. Important tools for secondary prevention include improved methods for detecting and treating existing infections. Both types of prevention act synergistically to lower the reproductive rate of STIs and contribute to reductions in disease prevalence.

In the Philippines, a network of Social Hygiene Clinics provides screening and treatment for STI to registered female sex workers in over one hundred cities. Services in some SHC are very efficient permitting weekly to biweekly screening of over a thousand registered entertainment workers. However, the effectiveness of the screening methods used in SHC is unknown. Cervical gram stain, the test used for detecting gonococcal and chlamydial cervicitis, has been shown to have a low sensitivity to detect infection in other settings (45-65%) [28]. Arguably, repeat screening on a weekly basis, as done in SHC, may increase the sensitivity of cervical gram stain, but this has not yet been evaluated. Nor do the clinics reach all women involved in sex work. Some categories of entertainment workers are exempt from regular exams, or are only required to provide urine samples (with very low sensitivity for detecting STI). Many informal sex workers evade the system entirely.

This report describes the experience of a multi-faceted intervention project to improve STI control in Angeles City. Concerned about high rates of curable STI, local health authorities and NGOs have been collaborating to improve coverage and effectiveness of prevention activities throughout the city. The city passed an ordinance that strongly endorses condom use in commercial sex establishments, outreach to informal sex workers was strengthened and an effort was made to reach the clients of sex workers. Clinical services were also examined. Screening algorithms were modified to increase sensitivity in an attempt to identify and treat more women with infection. Screening was extended to freelance sex workers not

previously reached by the SHC system.

In addition, in order to rapidly reduce the prevalence of the two most common curable STIs (gonorrhea and chlamydia), a one-time treatment with azithromycin was offered to all registered and freelance sex workers reached over a period of one month from February to March 2001.

In order to evaluate the impact of these interventions, STI prevalence was measured at baseline and twice during different phases of project implementation. An initial assessment was conducted after completion of the presumptive treatment phase to evaluate the short-term benefit of this measure. A second assessment was carried out six months later to better evaluate the effectiveness of the combined interventions to maintain lower STI rates over the longer term.

Baseline results show that a large number of women working in the entertainment industry in Angeles are at considerable risk of infection with several STIs. Reported condom use varies by type of sex work but consistent condom use was low, approaching 60% only in RSW. High baseline rates of both gonorrhea and chlamydia for all groups (from 22% for GRO to 51% for BSW) confirm findings from previous studies.

Risk of infection varies by type of sex work. Almost half of the women reached during the month-long intervention phase were registered female sex workers (RSW) and an additional third were guest relations officers (GRO). Both these categories of entertainment workers are ‘in the system’ and receive some form of regular STI screening.

The remaining 14% are ‘freelancers’ working in brothels or on the street and did not previously have access to regular screening. Importantly for STI control, these women reported higher numbers of clients and lower condom use, and were found to have the highest STI rates. Provision of effective curative and preventive services for these women was considered essential to reducing the prevalence of curable STIs in Angeles City.

The single round of presumptive treatment had an impact on STI rates, although this varied considerably by category of sex worker. Infection rates with gonorrhea

and/or chlamydia fell 73% among GRO and 47% among BSW, but only 39% for SSW and 28% among RSW. Reasons for this are probably several but mobility is clearly important. While 75% of GRO and 79% of BSW sampled at follow-up had received PT a month earlier, only 50% of the RSW and 63% of SSW had been previously reached. If higher PT coverage rates had been achieved, reductions in STI prevalence would have been even greater. In fact, when gonorrhea and chlamydial infection rates at baseline and follow-up are compared for women who received PT, greater STI reductions were indeed measured.

This 'dilution' of the presumptive treatment effect by returning women or newcomers with high infection rates would argue for some form of ongoing presumptive treatment, at least for women entering the system. Screening algorithms for sex workers that include a round of PT, with or without risk-assessment criteria, for new or returning women are being evaluated in other countries [29].

Table 7 Other presumptive treatment models

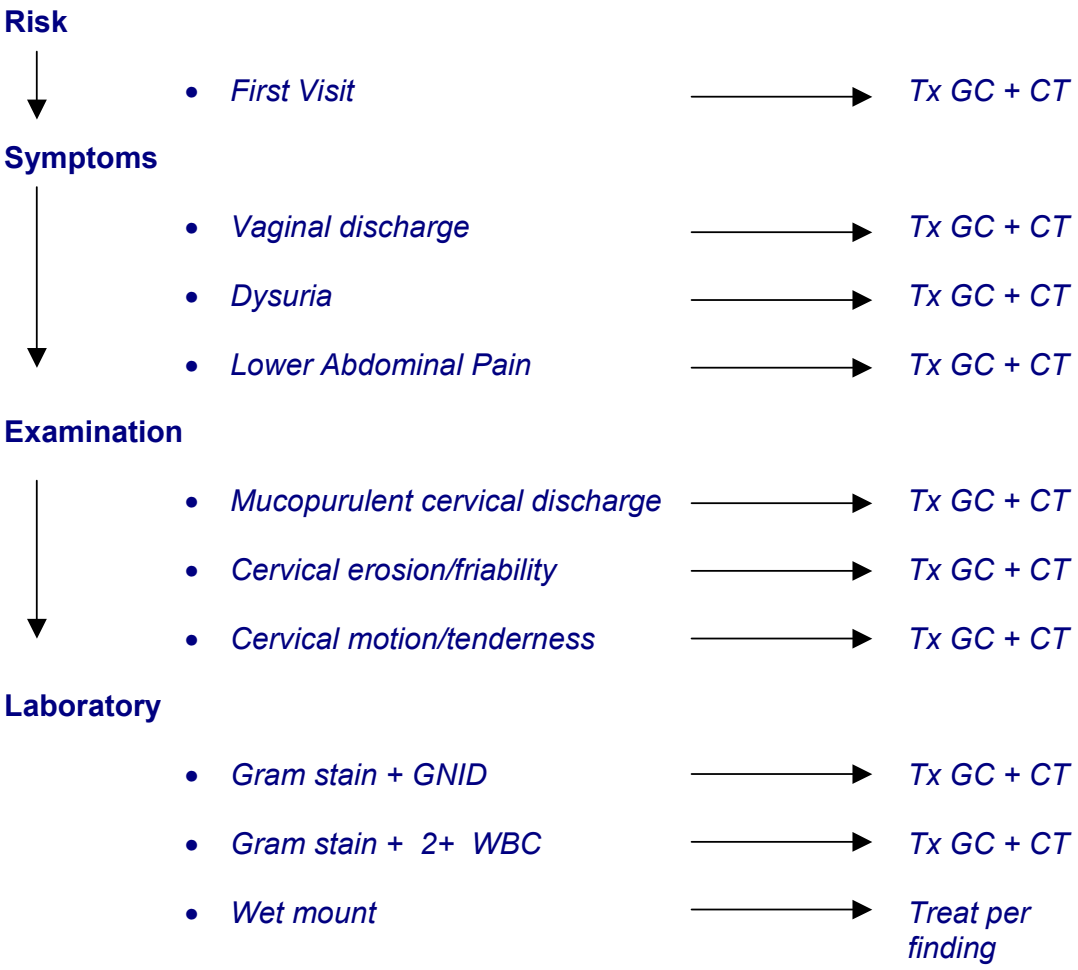
Country	PT strategy
South Africa	PT every month for all women for first 3-6 months, then every 3 months. Additional syndromic treatment for women with symptoms.
Cambodia	PT at first visit for all new women. Syndromic treatment for women with symptoms.
Cote d'Ivoire	PT at first visit if risk criteria met. Syndromic treatment for women with symptoms.
Madagascar	PT at first visit for all new women. Syndromic treatment for women with symptoms.

Whatever the benefit of one round of presumptive treatment, something more is needed to maintain lower STI rates. Efforts were made to improve both the accessibility and quality of screening services for all categories of sex workers following PT. Registered SW already had good access to screening since weekly SHC visits are required for work. Screening for other categories of SW was more

variable. Following PT, access to screening improved most for brothel-based and street-based SW.

The sensitivity of screening methods was also a concern and recommendations were made to broaden the criteria for treatment. Specifically, inclusion of clinical criteria was recommended and treatment was advised for women with any clinical evidence of cervicitis. The new screening criteria (Figure 11) were recommended for all categories of SW but were effectively applied only in clinic services for BSW and SSW.

Figure 11 Proposed algorithm for SW screening



The proportion of SWs treated is a measure of the adoption of the more sensitive criteria. Between 2-3% of RSW were treated, while between 8-21% of BSW received treatment. Importantly, the proportion of BSW treated actually declined over the six-month project period (becoming more cost-effective). Possible explanations for this are several. Women may have fewer signs of infection due to clearing up a large burden of pre-existing prevalent infections. Fewer signs of infection may also reflect more effective prevention and higher rates of condom use.

The second round of evaluation showed that STI prevalence came back to baseline levels among RSW and GRO, but remained at post-PT levels for BSW and SSW. It is not possible to say with certainty which intervention components were responsible for these different outcomes. Exposure to condom promotion messages was similar for the different groups and no large changes in reported condom use were measured. The most apparent differences in intervention exposure were in access to improved screening services.

There is also evidence that STI prevalence declined among clients, at least in the area of the brothels (the only area where client screening was feasible). A 46% decline in GC/CT prevalence, combined with significantly lower rates among the BSW themselves illustrates the potential public health impact of the intervention. In addition, since only five percent of these men reported condom use at last sex with regular partners, reductions in STI prevalence in this bridging group should also reduce STI transmission to their other partners.

In summary, this operations research provides information of potential relevance to other settings where sex work is common and targeted STI interventions are in place or planned. Descriptive data identified differences between categories of sex workers that were important for orienting services. In Angeles City, the two categories of freelance SW without access to screening services had the highest numbers of partners, lowest reported condom use and highest STI prevalence.

Two interventions, implemented in a broader prevention context, were shown to have significant impact on STI prevalence. One-time presumptive treatment reduced STI prevalence quickly, although the impact was influenced by coverage. High coverage was difficult to achieve during a one-month PT ‘campaign’ due to

the high mobility of the women.

Presumptive treatment is a short-term intervention to reduce high STI prevalence rates in key 'core' populations, and is not a sufficient STI control measure by itself. In order to maintain reductions, a broad range of curative and preventive services for all categories of entertainment workers, and for their clients, were strengthened. Owners and managers of entertainment establishments were encouraged to support universal condom use, and outreach workers promoted condom use and utilization of STI services for clients. Outreach to freelance sex workers was strengthened and screening services put in place for women who were previously 'outside the system'. Screening algorithms were modified to improve their sensitivity for detecting infection.

Six months later, STI prevalence remained low in the two groups of sex workers for whom accessibility to improved services improved the most. Regular screening visits and a screening algorithm that resulted in higher rates of treatment were apparent factors. In fact, brothel-based SW who initially had the highest prevalence of risk behaviors and infection, had lowest STI prevalence at the end of the project period.

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