

Lao's People Democratic Republic

Ministry of Health
Center for HIV/AIDS/STI
(CHAS)

**Integrated
Behavioral Biological
Surveillance
2008**

June 2009



USAID
FROM THE AMERICAN PEOPLE



Family Health
International



Investing in our future

The Global Fund
To Fight AIDS, Tuberculosis and Malaria



World Health
Organization
Western Pacific Region



UNAIDS
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS

UNHCR
UNICEF
WFP
UNDP
UNFPA

UNODC
ILO
UNESCO
WHO
WORLD BANK



Integrated Behavioral Biological Surveillance 2008

June 2009



USAID
FROM THE AMERICAN PEOPLE



Family Health
International



Investing in our future

The Global Fund
To Fight AIDS, Tuberculosis and Malaria



World Health
Organization
Western Pacific Region



UNAIDS
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS

UNHCR
UNICEF
WFP
UNDP
UNFPA

UNODC
ILO
UNESCO
WHO
WORLD BANK



TABLE OF CONTENTS

I. Background and rationale	1
II. Objectives	2
III. Methods	3
3.1. Survey design	3
3.2. Survey populations	3
3.3. Survey area	4
3.4. Sample sizes	4
3.5. Sampling strategy	5
3.5.1. Service women	5
3.5.2. State enterprise electricity workers	6
3.6. Diseases to be studied and laboratory procedures	6
3.7. Survey procedures	7
3.7.1. Interviews	7
3.7.2. Clinical procedures	7
3.7.3. Composition of survey teams	8
3.7.4. Data Entry, Processing and Analysis	8
3.8. Ethical issues	8
3.8.1. Ethical review	9
3.9. Quality control	9
3.10. Project timeline	9
IV. Results	10
4.1. Service women	10
4.1.1. Demographic characteristics	10
4.1.2. Age at first sex and reproductive history	12
4.1.3. History of selling sex and establishments characteristics	12
4.1.4. Sexual partners	14
4.1.5. Clients characteristics	14
4.1.6. Availability of, attitude towards, and use of condoms	16
4.1.7. Violence from clients	19
4.1.8. Vaginal douching and sex during menstruation	20
4.1.9. Knowledge of HIV transmission	20
4.1.10. History of STI and uptake of STI services	22

4.1.11. Uptake of HIV testing services.....	22
4.1.12. Coverage of prevention programs and sources of information.....	23
4.1.13. Drug use and alcohol intake	23
4.1.14. Trends in behaviors	24
4.2.State company electricity workers	26
4.2.1. Demographic characteristics:.....	26
4.2.2. Sexual behaviors	27
4.2.3. Access to condoms and use of condoms	29
4.2.4. Sex with female sex workers	29
4.2.5. Knowledge of HIV transmission.....	31
4.2.6. History of STI and uptake of STI services	32
4.2.7. Uptake of HIV testing services.....	32
4.2.8. Coverage of prevention programs and sources of information.....	33
4.2.9. Drug use and alcohol intake	33
4.2.10. Trends in behaviors	34
V.Prevalence of HIV and sexually transmitted infections.....	36
5.1.HIV.....	36
5.1.1. Testing results.....	36
5.1.2. HIV prevalence	38
5.1.3. Trends.....	39
5.2.Chlamydia and gonorrhea among service women	40
5.2.1. Prevalence	40
5.2.2. Trends in prevalence	42
5.2.3. Implications for treatment strategy among service women	43
5.3.Syphilis	44
VI.Conclusion.....	47
6.1.Service women	47
6.2.Electricity workers.....	48
VII.Recommendations	49
LIST OF TABLES.....	50
LIST OF FIGURES	51
SURVEILLANCE TEAM.....	52



Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
BSS	Behavioral Surveillance Surveys
PCCAsec	Provincial Committee for the Control of AIDS Secretariat
CHAS	Center for HIV/AIDS/STI
NCLE	National Center Laboratory and Epidemiology
CT	Chlamydia trachomatis
CUP	Condom Use Program
DFSW	Direct Female Sex Worker
FHI	Family Health International
FSW	Female Sex Worker
HIV	Human Immunodeficiency Virus
HSV	Herpes Simplex Virus
IBBS	Integrated Biological and Behavioral Survey
NCHADS	National Center for HIV Dermatology and STDs
NG	<i>Neisseria gonorrhoeae</i>
NGO	Non-Government Organization
NIOPH	National Institute of Public Health
PCR	Polymerase Chain Reaction
PID	Pelvic Inflammatory Disease
PCCA	Provincial Committee Control of AIDS
PPT	Periodic Presumptive Treatment
QC	Quality Control
RHC	Reproductive Health Clinics
RPR	Rapid Plasma Reagin
SW	Service Women
STIs	Sexually Transmitted Infections
TB	Tuberculosis
TPHA	Treponema Pallidum Hemagglutination Agglutination
VCT	Voluntary Counseling and Testing



I. Background and rationale

HIV second generation surveillance is a system of surveillance that conducts repeated surveys of both behaviors, HIV serology and prevalence of STI (which serves as a proximate measure for recent exposure to unprotected sex) among population most at risk of HIV infection. It is also a flexible system that adapts to need of the country. Survey population and sentinel sites can be adjusted from one round of survey to another to take into account the findings from the previous round or a new situation in the country.

In Lao PDR, the first round of second generation surveillance that was conducted in 2001 provided the first national estimate of the frequency of HIV related risk behaviors as well as the prevalence estimates for HIV, gonorrhea, Chlamydia and syphilis. This first round of SGS included Service Women, Truckers, and Female Factory Workers. Police, Military, and Seasonal migrant workers were included to estimate their risk behaviors. Provinces included in the sentinel surveillance were the most populated and those with easy access to the target populations. This first round of surveillance found a low prevalence of HIV justifying focusing on groups with the highest level of risk behaviors.

The second round of second generation HIV surveillance was conducted in 2004. The target populations included: service women, long distance truck drivers, military, police, state enterprise water workers, and state enterprise electricity workers. Sentinel sites included most sites covered in round 1 and explored the situation a new sites. This second round of HIV surveillance observed an alarmingly high level of STI among service women who were increasingly selling sex as well. Moreover the prevalence of HIV appeared to be increasing among service women and was detectable among an occupational group of men (i.e. electricity workers). These findings suggested an early stage of a growing HIV epidemic driven by commercial sex and triggered a response including intensified prevention targeting service women and a revision of the strategy to control STI among this group.

In 2008, a third round of HIV surveillance is needed in Lao PDR to investigate the state of the epidemic, estimate the impact of the program implemented since last round and adjust interventions accordingly.

II. Objectives

2.1. Primary objective:

- To determine the prevalence of *Neisseria gonorrhoeae*, Chlamydia trachomatis, and syphilis among service women in Lao PDR.
- To determine the prevalence of HIV among male state enterprise workers and service women in Lao PDR.
- To identify the behaviors that carry a high risk for HIV and STI infections among service women and state enterprise workers in Lao PDR.

Secondary objective:

- To evaluate the strength of the associations between risk behaviors and exposures to STI/HIV among the groups tested.
- To provide trend data for analyzing changes in prevalence and behavioral risk and to evaluate the national response to the epidemic.
- To provide evidence for determining national HIV and STI prevention strategies.
- To determine health-seeking behaviors among those with current STIs, and those reporting symptoms of STIs in the previous year



III. Methods

3.1. Survey design

A cross-sectional study design was used. Participation to the survey was voluntary and anonymous.

3.2. Survey populations

Service women:

Defining and identifying women who sell sex for money in Lao PDR can be particularly difficult. Women working in small drink shops and nightclubs may engage in commercial sex transactions, but their employment in these venues does not automatically signify that they are selling sex, as opposed to just serving beer or having conversation with their customers. This population has been used in previous round of surveys to approximate female sex workers. However, women were not screened to determine whether they sold sex or not. Instead, all women who worked in these establishments and had direct contact with clients, whether by selling them drinks or sitting with them, were defined as service women.

Those eligible were:

- Women
- Aged between 15 to 49 years old
- Working in small drink shops, beer gardens, karaoke bars, or other entertainment establishments
- Not menstruating at time of the interview
- Not hanged over at the time of the interview

State enterprise electricity workers

This population included in Lao PDR Second Generation Surveillance since Round 1 approximates clients with money from urban settings.

Those eligible included:

- Men
- Aged between 18 to 49 years old
- Working in the state enterprise electricity company for at least one year
- Not hanged over at the time of the interview

3.3. Survey area

The provinces included in the 2008 survey were selected purposively and included the provinces covered by the previous surveillance rounds to allow for comparability and construction of trends over time. The most populated provinces and thriving economic poles were selected to ensure a comprehensive picture of the HIV and STI epidemic situation in Lao PDR. Service women were recruited from the capital city of selected provinces. In Savannakhet service women were sampled from a single district, whereas they were selected from multiple districts in other provinces. District from which service women were selected were consistent with SGS Round-2. State electricity workers were selected from the provincial capital.

The provinces included in previous and present round of second generation surveillance by target population are as follows:

AREA	2001	2004	2008
Vientiane municipality	O	OX	OX
Champassak		OX	OX
Savannakhet	O	OX	OX
Bokeo		O	O
Luang Prabang	O	X	OX
Luang Namtha		O	O

O: Service women X: State enterprise electricity workers

In 2004, Service Women were not included in the surveillance due to the use of data from baseline for evaluation of the PPT in Luang Prabang.

3.4. Sample sizes

Sample sizes per province were determined in an empirical manner based on the sample sizes used in the second round of surveillance.

The sample size of 300 service women per province would allow disaggregating data by two variables. It would also provide a precision of +/- 6% around a 50% prevalence estimate for Chlamydia and gonorrhoea. In Luang Namtha and Bokeo, where the number of service women is not

sufficient to obtain a sample of 300 service women, the sample size was set at 150 or included all service women. It was anticipated that a sample of 150 would be too small to provide precise estimates. These two strata were sampled independently with the aim of combining them would the sample size be insufficient. However, in the present report they were analyzed independently.

For electricity workers provincial sample sizes were selected to enable disaggregating data by one level of variable. The overall sample size would provide a precision of +/- 0.48% around a HIV prevalence estimate of 0.5%.

Table 1: Expected sample size by province and survey group

	Vientiane Municipality	Savan nakhet	Cham passak	Luang Prabang	Luang Namtha	Bokeo	Total
Service women	300	300	300	300	150	150	1500
State enter-prieelectri cityworkers	300	150	150	150	--	--	750
Total	600	450	450	450	150	150	2250

3.5. Sampling strategy

Due to the relatively easy access to the target groups it was possible to establish sampling frames of individuals. Participants were therefore selected using the optimal simple random sampling.

3.5.1. Service women

The Provincial Committee for the Control of AIDS Secretariat (PCCAsec) of the survey provinces established the sampling frames by listing all identified small drink shops and night clubs located in the survey area and made a nominative list of the service women working at each location. Service women were selected using systematic random sampling. When some of the service women selected would be missing at the time of the field team visit, a new list of all women present would be established and a number of women consistent with original plans would be selected randomly from the new list.

3.5.2. State enterprise electricity workers

An exhaustive list of all employees (including workers, technical and engineering staff, as well as management and administration staff) was established to serve as sampling frame. Participants were selected using systematic random sampling.

3.6. Diseases to be studied and laboratory procedures

The STIs tested for in the survey included Chlamydia, gonorrhea, and syphilis for service women. In addition, HIV testing was conducted on blood samples from both service women and state enterprise electricity workers.

Specimens:

- Women provided first void urine, collected using sterile, plastic, preservative-free specimen collection cups.
- Both men and women provided venous blood collected through venipuncture.

Adherence to standard operating procedures for specimen storage, handling, transport, and processing was documented.

STI Testing:

- Urine was frozen at -20°C and shipped to Institute Pasteur in Ho Chi Minh City (Vietnam) where it was tested for Chlamydia and gonorrhea using (Becton Dickinson ProbeTec strand displacement amplification).

Syphilis testing was performed at the Center of Laboratory and Epidemiology (CLE) using:

- Rapid Plasma Reagin (RPR) quantitative tests
- Those positive to RPR were retested using a Treponema Pallidum Hemagglutination Assay (TPHA).

HIV testing was performed from full blood at the provincial hospital laboratory using

- Determine® HIV-1 (Abott)
- HIV 1/2 STAT-PAK (Chembio Diagnostic Systems)
- Sera from those positive to both HIV rapid tests as well as those with discrepant results between the two HIV rapid tests were sent to the National Center for Laboratory and Epidemiology (NCLE) for confirmation by Vironostika (bioMerieux).

3.7. Survey procedures

Although sampling frames were nominative, individuals were protected by anonymity, i.e., their names was not recorded anywhere and their survey participant number was not linked to the sampling frame. Participation was voluntary. Participants provided witnessed verbal consent, and all survey documents and specimens were labeled with coding numbers.

Data collection among service women took place at their work place where arrangements were made to provide privacy. State enterprise electricity workers were seen in a room with adequate privacy, located within the company premises.

Due to logistics difficulties, none of the tests results were made available to participants. However, survey participants were offered an attending with a trained clinical officer who provided counseling, syndromic diagnosis and management of STIs, referral to voluntary HIV testing and information on available support services in the vicinity.

3.7.1. Interviews

Participants were interviewed face-to-face by same-sex interviewers recruited among PCCAsec. Visual and auditory privacy was ensured during the interview. All questionnaires were pre-tested among respective survey populations and adapted as required prior to data collection. Interviews were conducted after an individual agreed to participate in the survey as part of the informed consent process and prior to collection of biological samples. Participants were told that they could refuse to answer any of the questions and could withdraw from the survey at any time. On average, it took about 25 minutes to provide informed consent and complete one interview.

3.7.2. Clinical procedures

The clinical procedures involved in the STI prevalence survey were standard procedures for collection of clinical specimens and reports of STI related symptoms, as well as standard treatments. All personnel involved in carrying out clinical procedures were medical professionals.

6 ml of venous blood was withdrawn through phlebotomy. Female participants self-collected first void urine.

Survey participants were offered an attending with a trained clinical officer who provided counseling about safe sex behavior, HIV and STIs transmission, and a demonstration on correct use of condom. The clinical officer referred participants for voluntary HIV testing in their area would they wish to obtain their HIV test results. The clinical officer also provided participants with syndromic diagnosis and management of STIs following the approved National STI Case Management Guidelines of Lao PDR and stressed the importance of getting STIs treated.

3.7.3. Composition of survey teams

The teams were specifically trained to collect data from one particular sentinel group and were entirely gender matched with target population. Regardless of group, the composition of the data collection team for each group included: a team leader (responsible for the sampling and the overall supervision of the data collection at each sites), a clinical officer (in charge of supervising the adequate prescription of standard treatments), two interviewers (who collected demographic and behavioral data), a screener (in charge administering informed consent and, a nurse/paramedic (responsible for collection and labelling of biological samples as well as the management of the cold chain), and driver (responsible for the transportation of the team and biological samples). Supervision was conducted by staff from central level (including a Laboratory staff and a CHAS staff) who ensured adherence to protocol, and controlled both quality of specimen management and completeness of questionnaires.

3.7.4. Data Entry, Processing and Analysis

Questionnaire and lab forms were transported and stored at the CHAS principal investigator office.

Double data entry was performed using “Epi Info 6.0”. Data analysis was performed jointly by CHAS and FHI using STATA 9.0. Data from service women were weighted to account for difference in population size by province. Data from electricity workers were not weighted for analysis.

3.8. Ethical issues

Because of the age composition of the sentinel groups, the survey inves-

tigators were cognizant of the fact that some of the potential participants may be youth, aged 15 to 18 years. The survey was designed to balance the maximal protection of participants with the individual and community benefits provided by the survey. Informed consent was given verbally and was witnessed and documented. No names were recorded and all the documentation was entirely anonymous. The field workers were trained on confidentiality issues.

- Although minors (aged 15-17) possibly constitute a small proportion of the sentinel groups, i.e., about 14% of the service women population (IBSS-2005), parental consent was not required for survey participation. Service women real age is often difficult to determine as under-aged workers tend to report higher age. This survey did not specifically recruit persons as young as 15 years but included them because, as members of these high risk sentinel groups, they could benefit from the appropriately targeted STI/HIV information being provided to participants.

3.8.1. Ethical review

The protocol, consent forms and draft questionnaires were consistent with that used for Lao PDR second generation surveillance round 2, which was approved by the Lao Ethical Review Board. Even though, procedures were consistent with previous round of surveillance, approval from the National Ethical Committee was sought due to involvement of human subjects. As a routine, permission from the Ministry of Health to conduct the 3rd Round SGS was also obtained.

3.9. Quality control

All specimens positive to HIV tests and a 10% random sample of those negative to HIV tests from each province were selected and retested at the Center for Laboratory and Epidemiology using ELISA tests. QC testing was performed using Vironostika (bioMerieux).

No QC was performed for urine PCR testing as Institute Pasteur internal QC procedures were considered sufficient to ensure quality standards.

3.10. Project timeline

Data were collected from 8th to 21st January 2008

IV. Results

4.1. Service women

Samples were collected from 1425 service women. In Bokeo and Luang Prabang the sample size target was not reached after inclusion of all service women included in the sampling frame. In other provinces, only a sample of the service women participated in the survey. The actual number of service women recruited into the survey differs is presented in table 2. These numbers differ slightly from the expected sample size reported in table 1.

Table 2: Sample size of second generation surveillance round-3 among service women, by province

Province	Sample size	% of overall sample
Vientiane municipality	300	21
Savannakhet	300	21
Champassak	300	21
Luang Namtha	150	11
Bokeo	142	10
Luang Prabang	233	16

Of those who accepted to participate, 7 (0.5 %) refused to provide blood and 9 (0.6 %) refused to provide urine.

4.1.1. Demographic characteristics

Demographics among service women are presented in table 3. The majority (85%) of the service women participating in the survey were recruited in drink shops, night-clubs or karaoke bars. The mean age of service women was 20.8 years old (95% CI [20.7 – 20.9]). About half of the service women were teenagers and 16% were aged more than 25 years old. The majority of service women were never married (76%) and another 22% were divorced. Some of the service women were educated as 12% had completed college. The majority of service women were internal migrants who had been living in the city of interview for less than 6 months. However, in Luang Prabang they were a majority to have sold sex in their province of origin, whereas in other provinces most service women had migrated across provinces. Depending on the province, between 7% (in Vientiane) and 22% of the

service women (in Bokeo) had worked as service women in other provinces than the province where they were interviewed. Overall, most service women originated from Luang Prabang province (29%) or from Vientiane province (24%) [data not shown].

Table 3: Demographic characteristics among service women

	Vien- tiane	Savan- nakhet	Cham- passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Place of recruitment							
Drink shop	61	52	71	96	65	83	67
Night club / karaoke bars	28	34	15	4	0	0	19
Restaurants	5	5	14	0	35	0	8
Guest houses	5	9	1	0	0	9	5
Street / free- lance	0	0	0	0	0	9	2
Age group							
15-19	50	36	38	68	48	73	48
20-24	39	38	42	25	38	19	36
25-43	11	26	20	7	14	8	16
Mean	20.3	22.1	21.7	19.3	20.7	18.9	20.8
Median	19.5	21.0	20.0	18.0	20.0	18.0	20.0
Highest level of education attended							
No school / primary school	42	52	46	56	65	76	53
Secondary / high school	43	33	42	27	28	17	35
>= College	15	15	11	17	7	7	12
Marital status							
Never married	79	73	69	87	72	84	76
Divorced	20	23	29	11	22	16	22
Currently married / widows	2	4	3	2	6	0	2
Have home town located in this province							
No	52	63	66	71	68	17	53
Yes	48	37	34	29	32	83	47
Duration living in this city							
<= 6 months	56	53	60	53	58	70	58
> 6 months	44	47	40	47	42	30	42
Had worked as service women in other provinces							
	7	15	19	17	22	10	14

4.1.2. Age at first sex and reproductive history

Service women had first sex on average at 16.8 years old (median 17 years). 11% had first sex before age 15. 40% of the service women had ever been pregnant and 12% were pregnant in the past 6 months suggesting that they may have become pregnant while on the job. Among the service women who had ever been pregnant 71% had ever had an abortion, which highlights the needs for family planning services.

Table 4: Sexual initiation and reproductive health among service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Age at first sex							
Mean	16.7	17.3	17.1	16.6	16.9	15.7	16.8
Median	17	17	17	16.5	17	16	17
Time since last pregnancy							
Never preg- nant	62	52	54	76	63	73	60
<= 6 months	14	10	15	10	4	13	12
> 6 months	24	38	31	14	32	13	28
Ever had Abortion (among those ever pregnant)							
Yes	71	80	78	44	31	76	71
No	29	20	27	56	69	34	29

4.1.3. History of selling sex and establishments characteristics

About a quarter of service women had sold sex at sexual initiation. It is noteworthy that almost all (96%) service women had sold sex in the past year, which qualifies the group as female sex workers. The turnover of service women was very high, ranging from half of the service women being new to the job every 3 months in Luang Prabang, to half of the service women being new to the job every 11 months in Savannakhet. Overall, about a quarter of the service women had been doing this job for 24 months or more (data not shown). This high turnover means that most of the service women are new to comers in the sex trade market and are ready to get infected. This turnover has substantial impact on the epidemic as newly infected individuals are more likely to pass-on the virus during their acute infection period. It also

has an impact on prevention effort as information must be delivered to a new group of women every year, justifying intensive continuous prevention and information activities to this target population.

Depending on the province, half of the service women had been staying from 2 to 5 months in the same establishment. However, the mean was substantially higher than the median indicating that some women stay for a long period of time in the same establishment. Still this information indicates a high mobility of a fringe of the service women population, which poses a challenge for outreach interventions and requires frequent visits to establishments to ensure a high coverage. The size of the drink shops was the largest in Vientiane (mean number of service women 14.7) and smallest in Luang Prabang (mean number of service women 4.7). About a quarter of the service women or guest house staff had been working in private service house prior to their current employment (data not shown).

Table 5: History of selling sex history and establishments characteristics

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Sold sex at first sex							
Yes	21	22	28	28	29	27	25
No	79	78	72	72	71	73	75
Sold sex past year							
Yes	98	92	98	97	100	96	96
No	2	8	2	3	0	4	2
Number of months doing this job							
Mean	12.8	14.7	13.3	13.1	14.7	8.2	12.9
Median	6	11.5	8	7	9	3	7
Number of months working in current establishmnt							
Mean	8.9	9.5	8.7	5.7	6.7	4.7	8.0
Median	5	5	4	3	2.5	2	3
Number of service women working in establishmnt							
Mean	14.7	9.8	9.7	9.6	6.1	4.7	10.0
Median	10.5	8	8	8.5	5	5	7

4.1.4. Sexual partners

Numbers and type of partners reported by service women are reported in table 6.

While only 17% of the service women had a regular partner in the past 3 months, half had regular partners in the same period of time. Their mean number of clients in the past week was small, ranging from 2.1 in Savannakhet to 3.9 in Luang Namtha. In the past week 11% of the service women did not have any clients.

Table 6: Number and type of sexual partners reported by service women

	Vientiane	Savannakhet	Cham passak	Luang Namtha	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Had regular partner in the past 3 months							
No	73	87	79	94	87	92	83
Yes	27	13	21	6	13	8	17
Sex with non-paying non-regular partner past 3 months							
No casual partner	68	35	38	52	50	62	50
Had one casual partner	20	42	42	36	45	24	34
Had multiple casual partners	12	23	20	13	5	14	17
Had clients past week							
No	13	22	4	7	25	1	11
Yes	87	78	96	93	75	99	89
Number of clients past week							
Mean	2.2	2.1	3.0	3.9	1.6	3.3	2.6
Median	2	2	2	3	1	3	2

4.1.5. Clients characteristics

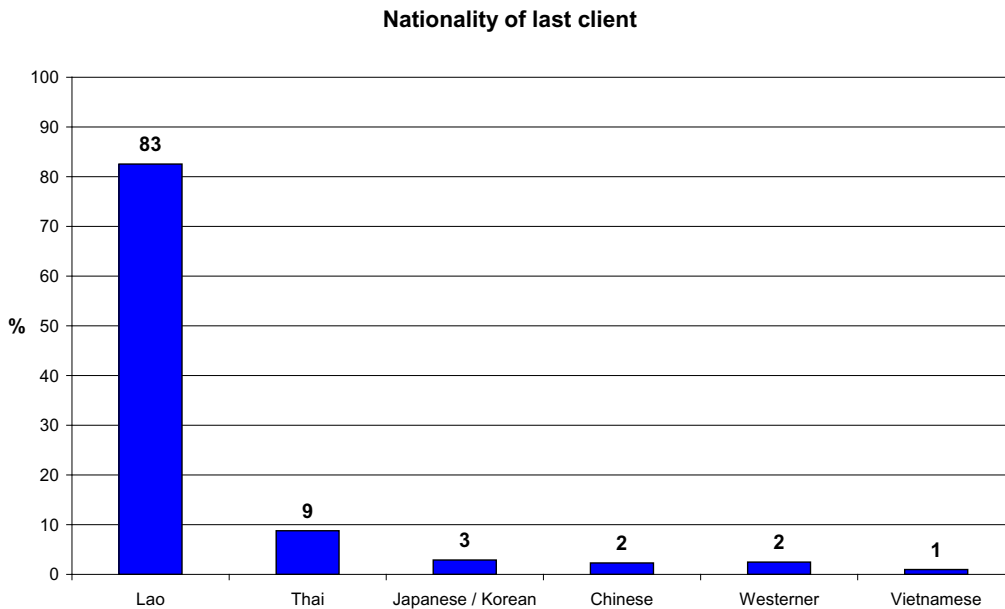
Clients of service women are a majority of Lao national (83%) or citizens from the neighboring Asian countries (14%). Most clients are civil servants (24%). Sexual services are more expensive in the largest cities (Vientiane, Savannakhet or Champassak) than in other cities. Half of the clients pay at least 200,000 Kips per sexual service.

Table 7: Characteristic of last client of service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bo keo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Nationality of last client							
Lao	76	78	84	83	87	96	83
Thai	5	19	9	3	11	2	9
Vietnames / Chinese	7	2	7	13	3	2	3
Japanese / Korean	9	1	0	1	0	0	2
Westerner	3	0	0	0	0	1	1
Profession of last client							
Civil servant	18	15	35	32	11	29	24
Military /police	9	6	4	14	16	13	8
Seller/business	7	9	9	12	13	9	9
Tourist	9	3	6	4	3	3	5
Driver/taxi /tuktuk	1	0	0	4	6	12	1
Employee	13	7	7	8	14	5	8
Other	2	15	4	11	7	15	8
Dont know	39	42	34	1	32	16	32
How much paid last client (Kip)							
Mean	296,225	383,849	292,396	197,848	246,239	194,375	291,465
Median	250,000	280,000	250,000	150,000	200,000	150,000	200,000

The nationality of service women's last client is presented in figure 1. The majority of their clients are Lao, followed by Thai and Japanese or Korean.

Fig 1: Nationality of last client



4.1.6. Availability of, attitude towards, and use of condoms

Information on access to condoms is presented in table 8. While about half of service women from Vientiane and Champassak could show the condom they were carrying at the time of interview, they were a small proportion in other provinces to carry a condom. Condoms were available at workplace in Vientiane, Savannakhet, Champassak and Luang Prabang, but they were not in Luang Namtha and Bokeo where service women were not carrying with any condom either. In all provinces, the majority of service women reported that they could purchase condoms when needed, but less than half of the service women had done so in the past month. The proportion of service women reporting having purchased condoms was particularly low in provinces where condom were made available at the establishments or were distributed through prevention projects (i.e. Vientiane, Savannakhet, Champassak). While a condom costs about 5,000 kips at all sites, the most frequently reported source for last condom was prevention projects.

Table 8: Access to condoms

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Carries and can show condom at time of interview							
Yes	53	27	51	5	2	19	36
No	47	73	49	95	98	81	64
Condom available at workplace							
Yes	99	98	89	89	89	96	95
No	1	2	11	11	11	4	5
Can purchase a condom outside nearby when need one							
Yes	80	80	92	89	81	80	83
No	20	20	8	11	19	20	17
Ever purchased condom past month							
Yes	40	26	60	79	70	84	48
No	60	74	40	21	30	16	52
Cost of a condom							
Mean	5,463	6,151	6,466	4,581	3,631	4,231	5,321
Median	5,000	5,000	5,000	3,000	5,000	5,000	5,000
Where obtained last condom							
Pharmacy / vending stall	7	5	31	25	26	40	19
Health facility	16	7	10	1	21	8	11
Bar/guest house/hotel	28	14	20	7	1	4	16
Madam/pimp	6	15	10	61	40	42	19
Project	40	55	26	1	8	1	30
Other	3	5	3	5	4	4	4

Condom use at last sex with clients was high in all provinces. While condom use at last sex with regular clients was almost as high as with other clients (90% versus 95%), condom use at last sex with casual partner relatively low (66%) and condom use at last sex with regular partners was very low (29%). Over the past 3 months, consistent condom use with clients was still insufficient ($\leq 60\%$) to control any STI epidemic in Luang Namtha, Bokeo and Luang Prabang. Because the proportion of service women who have casual partners is smaller than that having sex with clients, 20% had unprotected

sex with casual partners in the past 3 months and 28% had unprotected sex with clients over the same period of time (data not shown). Thirty-two percents of service women reported having experienced condom breakage, which is likely to be caused by inadequate use of condoms as revealed by the 26% who reported having used two condoms on the top of one another in the past 3 months. Hands on condom activities to service women would be beneficial.

Table 9: Use of male condoms by type of partners

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Condom use at last sex							
With regular partner	28	36	44	33	5	21	33
With casual partner	66	70	74	72	37	64	68
With regular client	92	88	93	91	77	89	90
With client	95	98	97	94	95	88	95
Condom use with regular partner past year							
Never	15	31	26	67	50	44	22
Sometimes	29	54	40	22	11	17	34
Always	56	15	34	11	39	39	48
Condom use with casual partner in the past 3 months							
Never	22	17	18	14	34	25	20
Sometimes	31	30	31	32	35	34	31
Always	47	53	51	54	31	42	49
Condom use with clients in the past 3 months							
Never	2	0	1	1	0	2	1
Sometimes	24	18	21	39	56	50	28
Always	74	81	78	60	44	48	70
Had condom breakage with clients in the past 3 months							
Yes	31	32	31	31	33	34	32
No	69	68	69	69	67	66	68
Have used more than one condom at a time with clients in the past month							
Yes	27	34	30	10	21	12	26
No	73	66	70	90	79	88	74

Female condoms were unknown in Luang Namtha and Bokeo but most service women from other provinces had heard about female condoms. In Savannakhet and Champassak, about one service woman out of five had even tried using female condoms. One third to half of the users at those sites where they were promoted felt comfortable about using such condoms.

Table 10: Knowledge, attitudes and behaviors towards female condoms

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	%	%	%	%	%	%	%
Ever heard of femalecondm							
Yes	62	91	78	5	8	61	66
No	38	9	22	95	92	39	34
Ever seen femalecondm							
Yes	61	89	75	4	3	61	64
No	39	11	25	96	97	39	36
Ever used female condom							
Yes	7	21	22	1	0	13	14
No	93	79	78	99	100	87	86
Feel comfortable to use female condom with clients (of those who ever used female condom)							
Yes	13	53	34	1	0	24	23
No	87	47	66	99	100	76	77

4.1.7. Violence from clients

Twenty-two percents of the service women reported having been forced into sex in the past year. In addition about half of the service women in every province were forced by clients not to use condoms in the past 3 months. Program educating clients to condom use could help reducing this form of abuse to service women. Five percents had been physically molested by clients in the past 3 months.

Table 11: Reported violence from clients

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=303	n=300	n=301	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Have been forced into sex past year	22	25	19	27	18	21	22
Everpunched or hit by client in the past 3 months	6	6	4	11	3	2	5
Forced by client not to use condoms past 3 months	48	52	42	48	64	67	52

4.1.8. Vaginal douching and sex during menstruation

Almost all service women had practiced vaginal douching on their last working day and in most of the case have used products that may alter the vaginal mucosa. Ten percents of the service women continue selling sex during menstruation, which increases both the risk of transmission and infection with HIV.

Table 12: Vaginal douching and sex during menstruation among service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Had vaginal douching in the past working day							
Yes	99	100	99	40	75	93	93
No	1	0	1	60	25	7	7
Have used any product beside water for douching							
Yes	62	75	46	32	73	42	57
No	38	25	54	68	27	58	43
Have sex with clients during menstruation							
No	91	88	90	90	94	88	90
Yes	9	12	10	10	6	12	10

4.1.9. Knowledge of HIV transmission

Almost all service women have heard of HIV. However some of the service women still did not know that condoms could protect them from HIV. Their knowledge of HIV transmission was quite high including for blood transmission and mother to child transmission. Misconceptions regarding HIV transmission still persist. Particularly, 38% of service women thought that using antibiotic before or after sex could protect them from HIV and 27% thought that mosquitoes could be a vector for HIV.

Table 13: Knowledge of HIV transmission among service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ever heard of HIV	100	98	98	96	99	94	98
Know that con- doms prevent from HIV transmission*	97	95	91	87	95	91	97
Know that HIV is transmitted through stained needles	93	90	94	91	96	90	94
Know that HIV can be transmit- ted from mother to child during pregnancy and delivery	96	93	94	90	95	89	93
Know that faithful- ness to uninfected partner can pro- tect against HIV transmission*	90	75	71	85	82	67	73
Believe that can recognize HIV infected people*	8	14	25	15	36	37	20
Believe that HIV can be transmitted by mosquitoes*	21	30	28	26	30	30	27
Believe that HIV can be avoided by taking antibiotics before or after sex	41	33	45	29	44	32	38
Believe that HIV can be transmitted through sharing a meal with an infected person*	8	10	12	17	10	18	12
Percents who both correctly identify ways of preventing the sexual trans- mission of HIV and who reject major miscon- ceptions about HIV transmission (UNGASS)	68	46	34	55	36	45	48

* Questions used for construction of the UNGASS indicator

4.1.10. History of STI and uptake of STI services

About one third of the service women reported currently having STI symptoms. In provinces with drop-in centers for service women (Savannakhet, Vientiane, Champassak, and Luang Prabang), frequency of reported STI decreased, and more service women attended STI check up than in other provinces.

Table 14: Service women currently reporting symptoms and frequency of visits for STI checkup in the past 3 months

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Currently have STI symptoms							
	35	20	30	41	49	42	32
Have visited STI clinic for check-up in the past 3 months							
Never	46	27	64	90	90	66	55
1 time	30	35	18	7	9	16	23
2-3 time	15	24	11	3	0	10	14
>3 times	9	14	7	0	1	9	9

4.1.11. Uptake of HIV testing services

While a substantial proportion of the service women got tested in Savannakhet (33%) and Vientiane (26%), fewer took the test in other provinces and almost none did in Luang Prabang and Luang Namtha. Most of those who took the test accessed their results and about a quarter of the service women from Vientiane knew their sero status.

Table 15: Use of HIV testing services among service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Ever tested for HIV							
	26	33	17	1	16	5	21
Ever received HIV test results							
	26	21	16	1	9	4	17

4.1.12. Coverage of prevention programs and sources of information

In all provinces the majority of the service women had received information on HIV in the past year. Government staff provided information on HIV to 86% of the service women, whereas NGO covered 50% of them. Both government and NGOs activities overlapped as they mostly provided information to the same individuals. Apart from Luang Namtha, most service women from other provinces had received some printed material in the past year. Those who had participated in HIV information session in the past year had been working as service women for a longer duration than those who did not receive information (mean duration as service women 13.8 months versus 6.6 months, $p < 0.001$). Hence, prevention program should emphasize on new comers.

Table 16: Coverage of prevention interventions to service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namtha	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Received information on HIV from government staff past year	91	88	86	77	81	82	86
Received information on HIV from NGO staff in past 3 months	59	35	65	41	56	36	50
Have received printed material on HIV in the past 3 months	81	84	82	29	74	62	76

4.1.13. Drug use and alcohol intake

Overall, only 1% of the service women reported having injected drug in the past year. While 9% of the service women had used methamphetamine in the past year, the proportion of methamphetamine users was substantially higher in Luang Namtha and Bokeo. Due to the nature of their profession as drink sellers, service women reported frequently using alcohol.

Table 17: Drug use and alcohol intake among service women

	Vien tiane	Savan nakhet	Cham passak	Luang Namta	Bokeo	Luang Prabang	Total (weighted)
	n=300	n=300	n=300	n=150	n=142	n=233	n=1425
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Frequency of alcohol intake							
Every day	70	54	78	78	28	36	61
Not every day	30	43	21	21	72	60	36
Never	0	3	1	1	0	4	2
Ever used methamphet- amine	9	7	9	16	17	2	9
Injected drug past year	0	2	1	2	0	0	1

4.1.14. Trends in behaviors

Because data were not available for every city and for each year of survey, the trends analysis was restricted to 3 cities that were surveyed in each round of survey (including Vientiane, Savannakhet and Luang Prabang). Therefore the estimates reported in this chapter are not comparable to overall estimates presented in this report. Data were weighted to account for service women population size in each city.

Figure 2 present the trends in proportion of service women reporting selling sex in the past year as well as the proportion who use condom at last sex with client and the proportion who use condom at last sex with non-paying non-regular partner (i.e. casual partner). From 2004 to 2008, the proportion of service women reporting selling sex has increased consistently, to the point when, in 2008, service women can be considered as a population of female sex-workers. While condom use at last sex with client as well as condom use at last sex with casual partners decreased between 2001 and 2004, these indicators increased substantially from 2004 to 2008.

Fig 2: Trends in selling sex and condom use at last sex with clients and casual partners

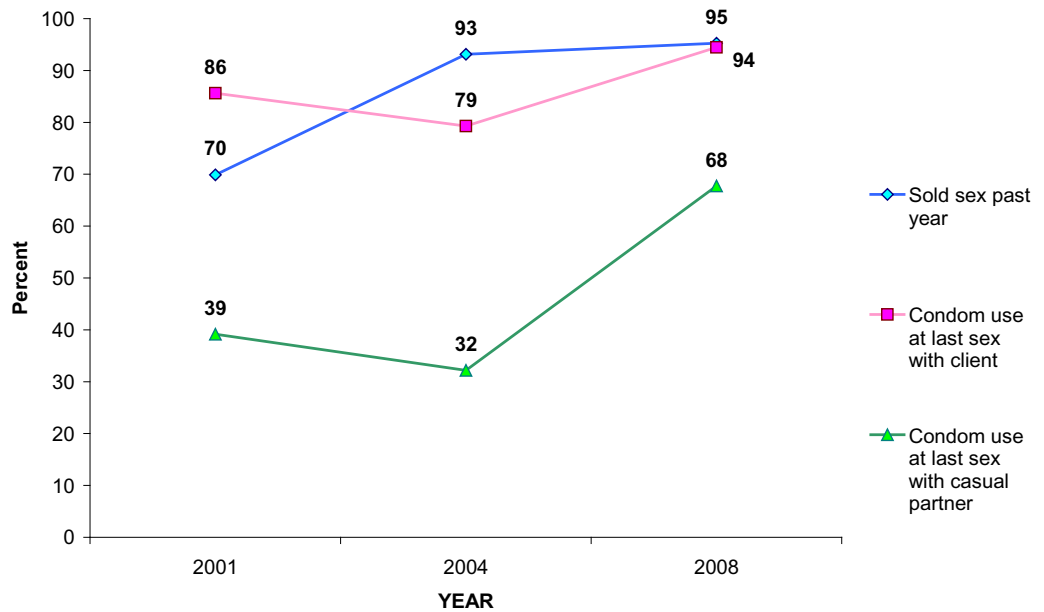
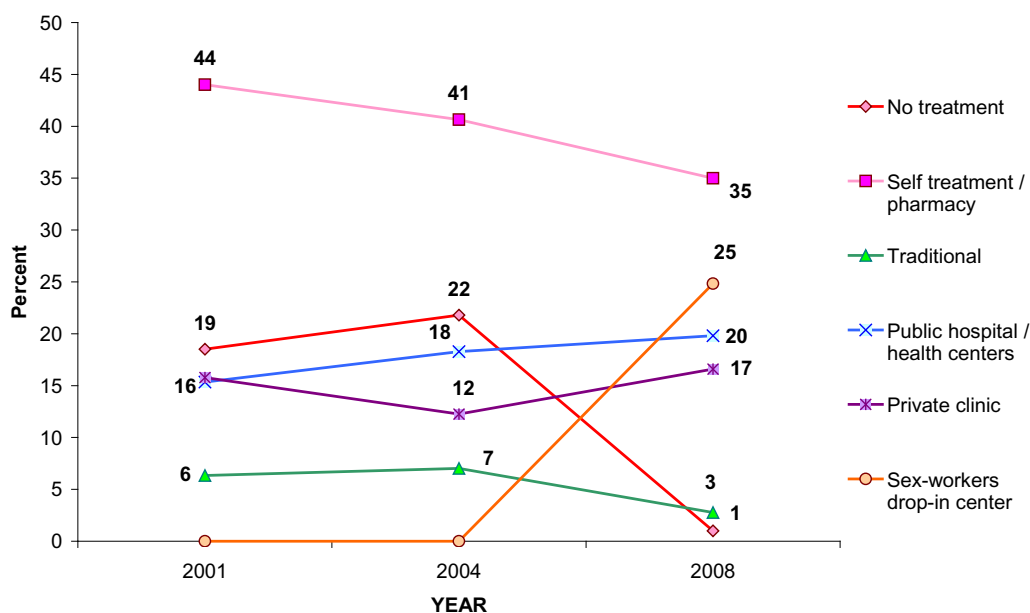


Figure 3 presents the trends in uptake of treatment services at last symptom of STI. From 2001 to 2008 there has been a noteworthy decrease in absence of treatment, self treatment or purchase of drugs over the counter, and treatment provided by traditional healer. Over the same period the uptake of services provided by public hospitals and health centers has slightly increased, but the newly available community services including drop-in centers for female sex workers or youth have been widely used.

Fig 3: Trends in first source of treatment at last STI symptom among service women



4.2. State company electricity workers

Although the expected sample size was 750, only 712 electricity workers could be recruited in the survey

4.2.1. Demographic characteristics:

Demographic characteristics among the state company electricity workers are presented in table 18. Electricity workers were aged 20 to 50 years old. The majority was aged above 40 years old and their mean age was 36.8 years. Most were currently married (81%). Those from Vientiane had higher education level than those from other provinces; in Vientiane 42% had attended university compared to 7% or less in other provinces. All types of position within the electricity state company were represented but there was some variation in the composition of the sample across provinces. Twelve percent had travelled to other provinces in the past 3 months and most of the trips were to Vientiane Capital. Eleven percent of those from Savannakhet had travelled abroad in the past 3 months as well as 6% of those from Vientiane and 3% of those from other provinces.

Table 18: Demographic characteristics of electricity workers

	Vien tiane	Savan nakhet	Cham passak	Luang Prabang	TOTAL
	N=300	n=150	n=150	n=112	n=712
	%	%	%	%	%
Age					
20-29	21	12	27	26	21
30-39	33	47	41	40	39
40-50	46	41	31	34	40
Mean	37.6	37.5	35.3	35.4	36.8
Median	38	38	36	36	37
Marital status					
Currently married	80	89	79	75	81
Single	20	11	19	21	18
Divorced / widow	0	0	1	4	1
Highest level attended at school					
No school / primary / high school	10	13	9	54	17
College	49	80	84	42	62
University / Post graduate	42	7	7	4	21
Occupation in the Electrical company					
Manager	25	13	57	12	27
Administrative staff	16	13	3	10	12
Worker	19	25	3	41	21
Technician	34	47	36	37	38
Engineer	6	3	0	1	3
Slept overnight in other provinces in the past 3 months					
Never	82	97	94	86	88
In Vientiane municipality only	9	3	1	9	6
In other provinces	10	0	5	5	6
Have slept overnight in Vientiane municipality past 3 months					
No	86	97	98	90	92
Yes	14	3	2	10	8
Ever slept overnight in foreign country in the past 3 months					
No	94	89	97	97	94
Yes	6	11	3	3	6

4.2.2. Sexual behaviors

Almost all men had sexual initiation (99%). Among those sexually active, 55% had multiple sexual partners in the past year. About half (51%) of the

electricity workers has sex with a female sex worker (FSW) in the past year and 23% had sex with non regular and non commercial partner (i.e. casual partner) in the past year. Overall, 22% of the electricity workers had unprotected sex with a non-regular partner in the past year. While 9% of the electricity workers were exposed to unprotected sex with female sex workers every quarters, they were 14% to have had unprotected sex with a casual partner in the past year. Since the time frame is different those proportion is not directly comparable. However it suggests that the proportion of electricity workers exposed to unprotected sex is roughly similar with sex workers and casual partners.

Table 19: Sexual behaviors among state enterprise electricity workers

	Vientiane	Savannakhet	Cham passak	Luang Prabang	TOTAL
	n=300	N=150	n=150	n=112	n=712
	%	%	%	%	%
Ever had sex	99	100	95	100	99
Sexually active men	n=298	N=150	n=143	n=112	n=703
	%	%	%	%	%
Number of sexual partners in the past year					
No partner	2	1	2	1	1
Single partner	41	43	56	34	43
Multiple partners	57	57	42	65	55
Had sex with regular partner past year	82	91	89	78	85
Had casual partners past year	28	16	27	16	23
Had sex with FSW past year	50	52	41	63	51
Had sex with Lao FSW past year	50	51	41	63	50
Had unprotected sex with FSW past 3 months	7	15	5	13	9
Had unprotected sex with casual partner past year	21	11	8	10	14
Had unprotected sex with any non regular partner past year					
No sex with non-regular partner	38	42	51	33	41
Protected sex	35	36	37	45	37
Unprotected sex	27	23	12	22	22

4.2.3. Access to condoms and use of condoms

Less than half (46%) of the state enterprise electricity workers who ever had sex had purchased condoms in the past year. They reported no difficulty in accessing condoms when needed. While few (8%) reported having used condom at last sex with their regular partner, 91% had used condom at last sex with a female sex worker (FSW) and 50% at last sex with a casual partner. The use of two condoms on the top of one another was reported by 13% of the FSW, which shows that misconceptions on adequate use of condoms are widespread. Condom breakages in sex with FSW were reported by 5% of the clients of FSW and was irregularly distributed across provinces, suggesting possible quality of storage issue or local misunderstanding on the appropriate use of condoms.

Table 20: Access to condoms and use of condoms among sexually active state enterprise electricity workers

	Vien tiane	Savan nakhet	Cham passak	Luang Prabang	TOTAL
	n=298	n=150	n=143	n=112	n=703
	%	%	%	%	%
Purchased condoms in the past 12 months	49	31	34	73	46
Always found condom when needed it	97	92	92	100	95
Condom use at last sex					
With regular partner	9	9	6	8	8
With casual partner	33	54	79	56	50
With FSW	93	84	95	89	91
Ever used 2 condoms on the top of one another in sex with FSW past 3 months	13	17	13	9	13
Ever experience condom breakage in the past 3 months (among clients of service women)	7	0	0	12	5

4.2.4. Sex with female sex workers

About half of the sexually active electricity workers had paid a woman for sex in the past year. Only 3% of the electricity workers had sex with a foreign sex worker in the past year and all of those who had sex with a foreign FSW also had sex with a Lao FSW in the past year. About half of the clients

of FSW had visited sex workers 3 times or more in the past year. The fact that about half of the clients had visited FSW in the past month suggests that a substantial proportion of the clients visit FSW on a regular basis. In all provinces the most frequently reported place where men found sex workers were drink shops. Guest house or hotel were frequently reported as well, particularly in Savannakhet and Luang Prabang. Only 5% of the clients had recruited their last partner through mobile phone network and streets was the less common place to recruit paid sexual partners. While 91% of the clients had used a condom at last sex with FSW, the clients reported that only 31% of the FSW had proposed using a condom. Since sex is purchased at drink shops, sex with FSW was almost always associated with alcohol intake.

Table 21: Purchase of sexual services among sexually active state enterprise electricity workers

	Vien tiane	Sava nakhet	Cham passak	Luang Prabang	TOTAL
	N=300	n=150	n=150	n=112	N=712
	%	%	%	%	%
Had sex with FSW past year	50	52	41	63	51
Had sex with foreign FSW past year	1	9	1	0	3
Had sex with FSW past year	N=146	n=77	n=58	n=68	N=349
Number of visits to FSW past year					
1	23	28	38	25	27
2	25	28	33	24	27
>=3	52	45	29	51	47
When visited FSW for the last time					
Past 30 days	55	34	48	49	48
Past 2 to 3 months	36	45	38	39	39
Past 4 to 12 months	8	21	14	13	13
Place where contacted last FSW					
Drink shop	75	55	60	53	64
Guest house / hotel	7	29	11	21	15
Female friend house	6	5	4	18	8
Night club	8	3	21	0	7
Mobile phone network	3	7	4	8	5
Street	1	1	2	0	1
Condom use at last sex with FSW	93	84	95	89	91
FSW proposed condom at last sex	32	46	38	10	31
Ever used alcohol before sex with FSW	100	99	98	100	99
Cost of sex with last FSW in the past year (Kip)					
Median	100,000	140,000	135,000	80,000	100,000

4.2.5. Knowledge of HIV transmission

Almost all electricity workers had heard of HIV. Knowledge of preventive method was good as 96% knew that HIV can be prevented by using condoms, 97% knew that HIV can be transmitted through stained needles, and 88% knew that faithfulness is a HIV prevention option. Although only 3% believed that HIV can be transmitted through sharing a meal with an infected person, 23% of the electricity workers (and 46% in Luang Prabang) still believed that the physical appearance allows recognizing HIV infected individuals, and 17% thought that mosquitoes serve as vector of HIV infection. Due to these misconceptions, only a little bit more than half (57%) of the electricity workers were correctly identifying ways of preventing the sexual transmission of HIV and rejected major misconceptions about HIV transmission.

Table 22: Knowledge of HIV transmission among state electricity workers

	Vien tiane n=300	Savan nakhet n=150	Cham passak n=150	Luang Prabang n=112	TOTAL n=712
	%	%	%	%	%
Ever heard of HIV	100	99	100	99	100
Know that condoms prevent HIV transmission*	97	97	95	95	96
Know that HIV is transmitted through stained needles	98	97	99	95	97
Know that faithfulness to uninfected partner can protect against HIV transmission*	89	87	86	90	88
Believe that can recognize HIV infected people*	31	4	7	46	23
Believe that HIV can be transmitted by mosquitoes*	19	11	19	18	17
Believe that HIV can be transmitted through sharing a meal with an infected person*	4	2	1	4	3
Percents who both correctly identify ways of preventing the sexual transmission of HIV and who reject major misconceptions about HIV transmission (UNGASS)	49	72	65	46	57

* Questions used for construction of the UNGASS indicator

4.2.6. History of STI and uptake of STI services

While a small proportion of electricity workers from Vientiane and Savannakhet reported currently having STI symptoms (3% and 1%, respectively), they were quite many from Champassak and Luang Prabang to report current symptoms (17% and 8% respectively). The proportion reporting symptoms of STI in the past 3 months followed the same pattern, with almost a quarter of the men from Champassak and Luang Prabang reporting symptoms in the past 3 months. The most frequently reported treatment option was self treatment and pharmacy, followed by private clinics, traditional practitioner, and public facilities were the least used. Treatment provided by medical professionals were rarely used in Champassak and Luang Prabang.

Table 23: Male electricity workers' reporting of STI symptoms and uptake of STI services at last STI episode which occurred in the past three months

	Vien tiane	Savan nakhet	Cham passak	Luang Prabang	TOTAL
	n=300	n=150	n=150	N=112	N=712
	%	%	%	%	%
Currently have symptoms of STI	3	1	17	8	7
Had STI symptoms in the past 3 months	5	11	23	24	13
	n=15	n=16	n=33	N=27	N=91
At last STI symptom that occurred in the past 3 months:					
Sought treatment at public facility	21	31	3	4	12
Sought treatment at private facility	36	38	21	13	24
Sought treatment at pharmacy / self treated	36	31	100	67	66
Sought treatment at traditional practitioner	0	13	34	13	18

4.2.7. Uptake of HIV testing services

Overall 65% of electricity workers knew where to get tested for HIV. However, in Vientiane, a smaller proportion electricity workers knew where to get tested than those living in other provinces. The proportion of electricity workers ever tested for HIV differed substantially across provinces.

Table 24: Knowledge and uptake of HIV testing among electricity workers

	Vien tiane	Savan nakhet	Cham passak	Luang Prabang	TOTAL
	n=300	n=150	n=150	n=112	n=712
	%	%	%	%	%
Know where to get HIV test in this city	57	65	65	83	65
Ever tested for HIV	4	31	22	2	13

4.2.8. Coverage of prevention programs and sources of information

While electricity workers are not a specific target of HIV prevention programs, 41% had received HIV information from the government. In the past 3 months about a quarter of the electricity workers had received free condoms and 21% had received HIV information through printed material.

Table 25: Coverage of prevention intervention to electricity workers

	Vien tiane	Savan nakhet	Cham passak	Luang Prabang	TOTAL
	n=300	n=150	n=150	n=112	n=712
	%	%	%	%	%
Attended HIV information session conducted by government staff past year	30	66	57	15	41
Attended HIV information session conducted by NGO staff past year	2	7	5	4	4
Visited STI clinic for check-up in the past 3 months	2	1	0	2	1
Received free condoms in the past 3 months	28	27	29	5	24
Received printed material on HIV in the past 3 months	21	21	29	9	21

4.2.9. Drug use and alcohol intake

The majority (94%) of electricity workers drunk alcohol at least weekly. None reported having injected in the past year. The most drug most frequently reported being used in the past year was psycho-stimulants (yaba, thinner); which was used by 1% of the electricity workers.

Table 26: Intake of intoxicants among electricity workers

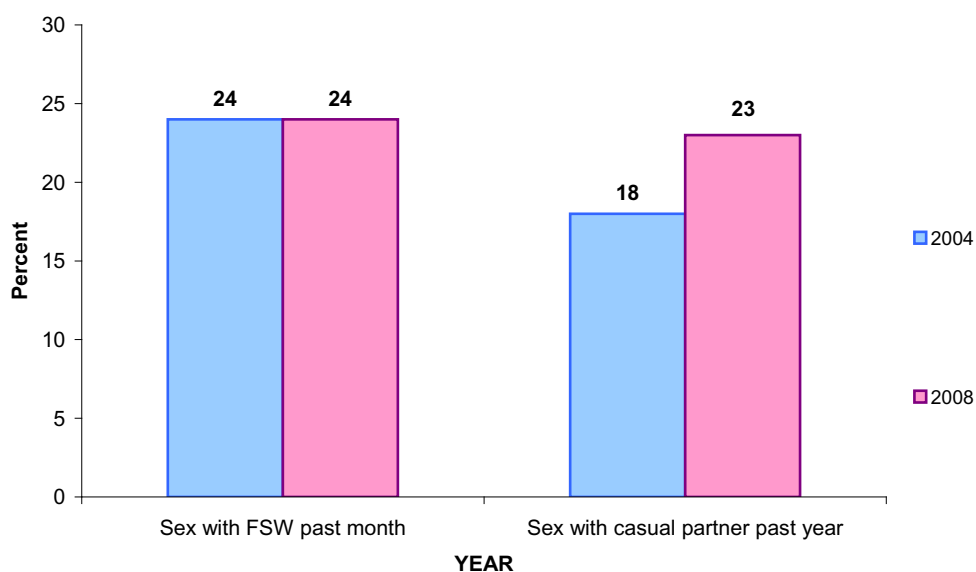
	Vien tiane n=300 %	Savan nakhet n=150 %	Cham passak n=150 %	Luang Prabang n=112 %	TOTAL n=712 %
Frequency of alcohol intake in the past month					
Never	9	6	5	0	6
Every day	21	7	11	0	13
Every week	59	73	72	96	71
Every 2-3 week	10	14	11	4	10
Ever used heroin	0	0	0	1	0
Ever used opium	0	0	1	1	0
Ever used psycho stimulants	1	1	1	3	1
Injected drug past year	0	0	0	0	0

4.2.10. Trends in behaviors

Figure 4 shows that the proportion of electricity workers who reported sex with female sex workers has remained unchanged from 2004 to 2008.

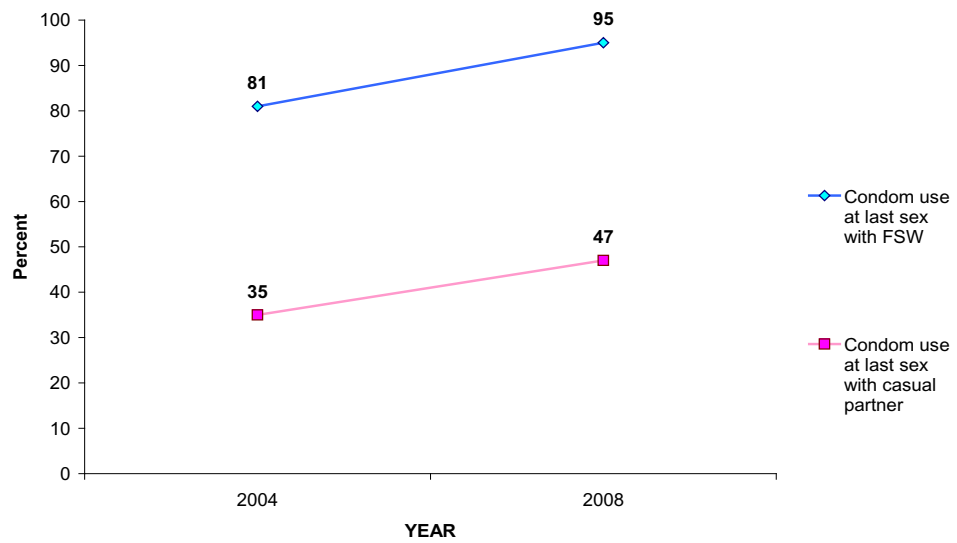
During the same interval, the proportion of electricity workers reporting sex with casual partners has increased from 18% to 23%.

Fig 4: Comparison of 2004 and 2008 data for electricity workers' sexual activity with FSW past month and casual partners past year



The comparison of 2004 and 2008 data on condom use with FSW and casual partners shows that the proportion of electricity workers who used condom at last sex increased between 2004 and 2008 with either of these two types of partners.

Fig 5: Trends in condom use at last sex with female sex worker and casual partners



V. Prevalence of HIV and sexually transmitted infections

5.1. HIV

5.1.1. Testing results

The results of HIV testing among the participants are presented in figure 6 for service women and figure 7 for male electricity workers

Fig 6: Results of HIV testing among service women

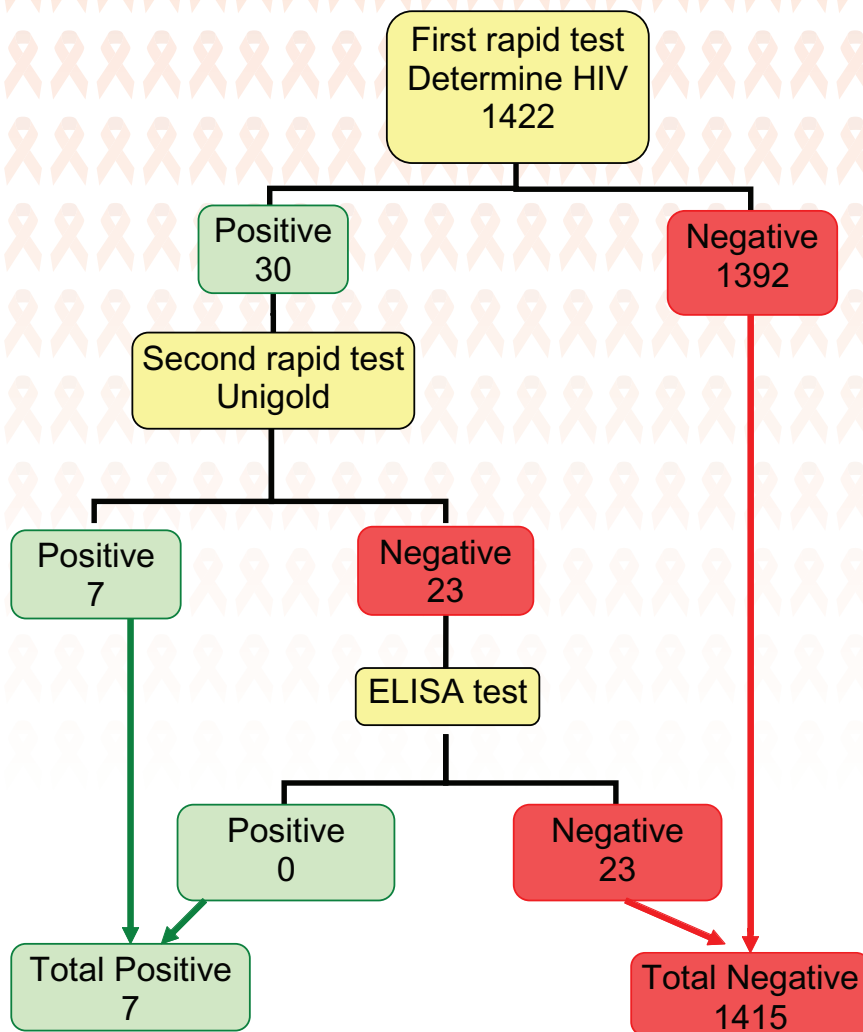
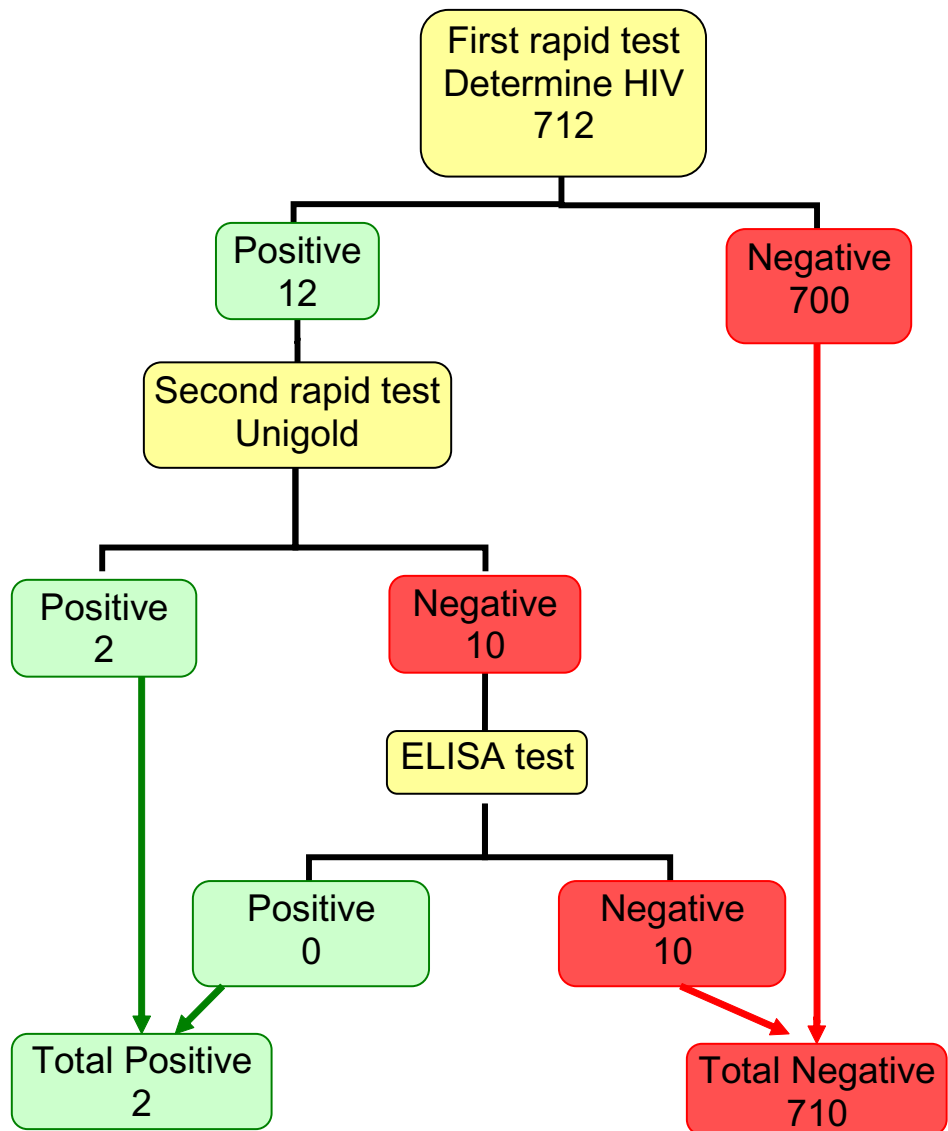


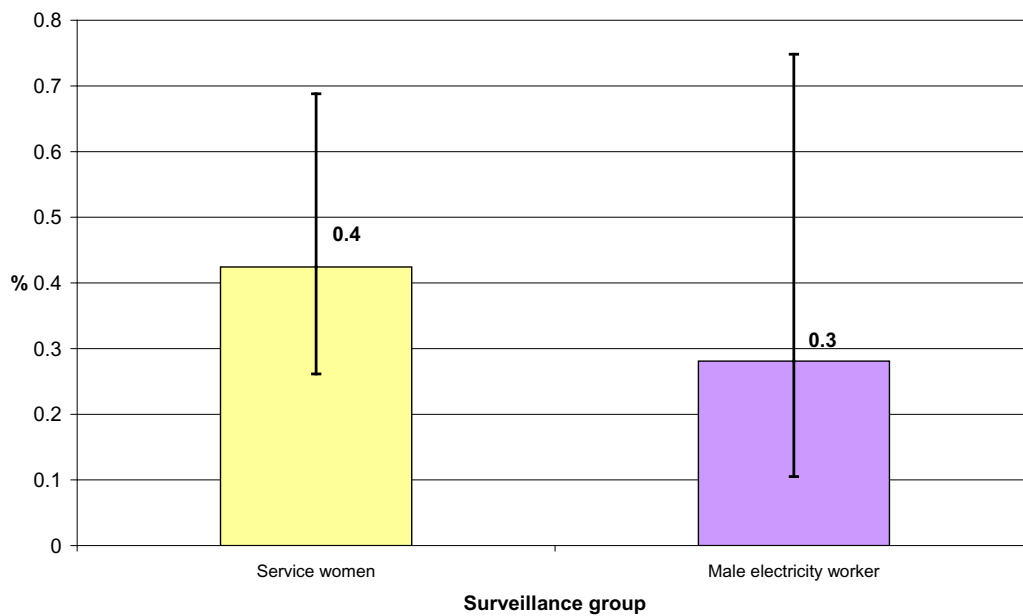
Fig 7: Results of HIV testing among electricity workers



5.1.2. HIV prevalence

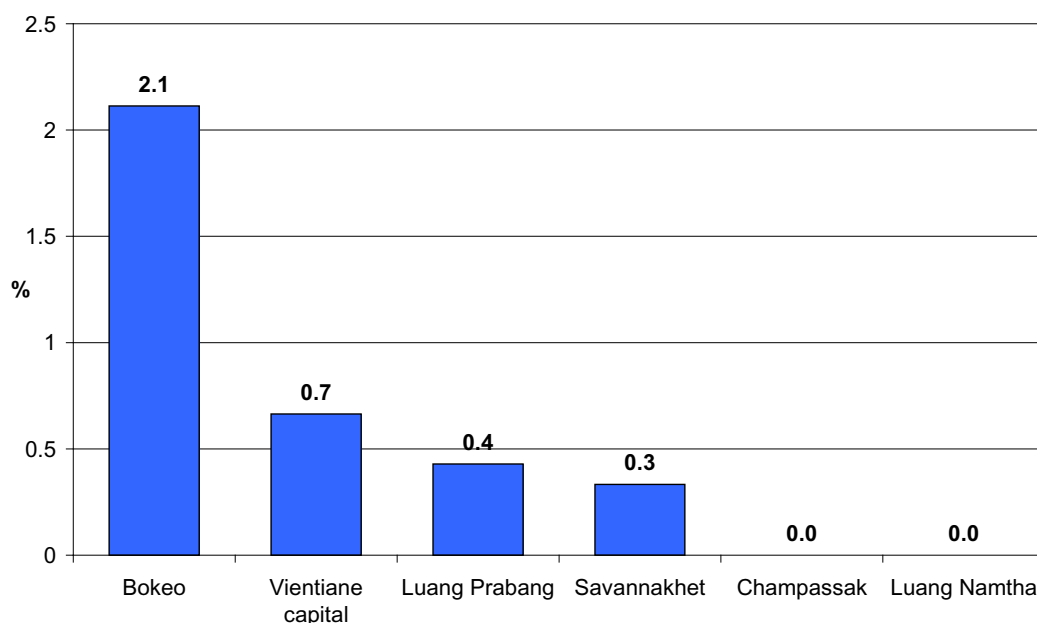
The prevalence of HIV as well as the possible variations in prevalence estimates due to the fact that the prevalence was obtained from a sample instead of the entire population from the surveillance groups are presented in figure 8. The prevalence of HIV is below 1% among both sex workers and their clients.

Fig 8: HIV prevalence by surveillance group



Because of the very few number of people infected with HIV, prevalence by province are likely to represent sampling variation and no hot spots can be identify using these provincial differences.

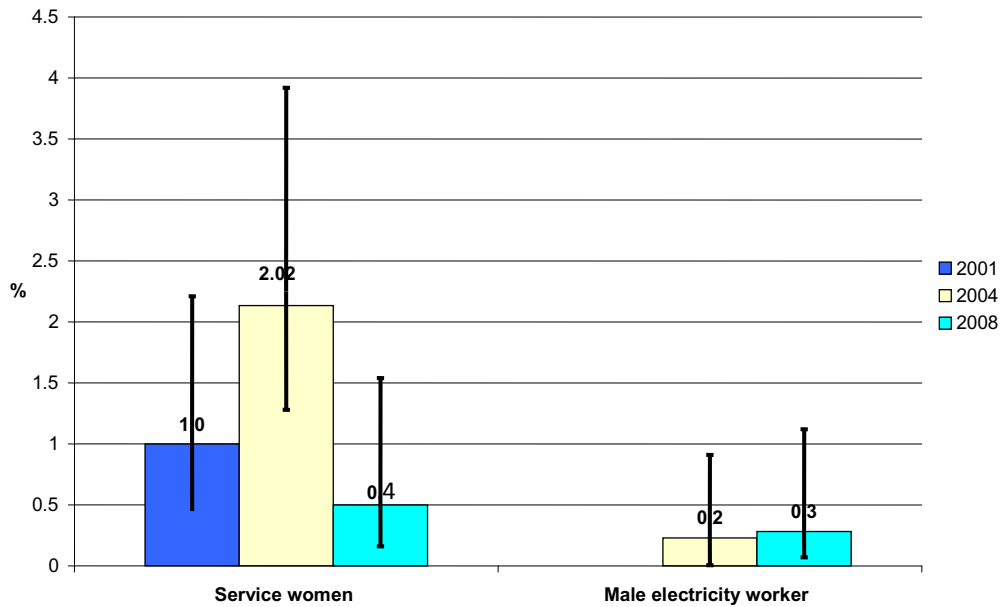
Fig 9: HIV prevalence estimates among service women in 2008, by province



5.1.3. Trends

Trends in HIV prevalence were calculated for service women in provinces where HIV was estimated across rounds of surveillance surveys (i.e. Vientiane and Savannakhet for service women; and Vientiane, Savannakhet, Champassak and Luang Prabang for electricity workers). Because a limited number of provinces are included in this trend analysis, the HIV prevalence estimates among service women presented in this paragraph are not comparable with that presented in the previous paragraph. Figure 10 shows that the prevalence of HIV among service women and electricity workers has not changed between 2001 and 2008. Since service women are characterized by a high turn over, it means that the incidence of HIV has not increased among service women. On the contrary, as behavior trends presented in this report show that the proportion of service women selling sex has increased over time, the incidence of HIV among service women may actually be decreasing. On the opposite of service women, electricity workers are a fairly stable population, with about 25% of the group hired since 2001. The absence of increase suggests that incidence of HIV has not increased among this group either.

Fig 10: Trends in HIV prevalence by risk groups (weighted for service women)

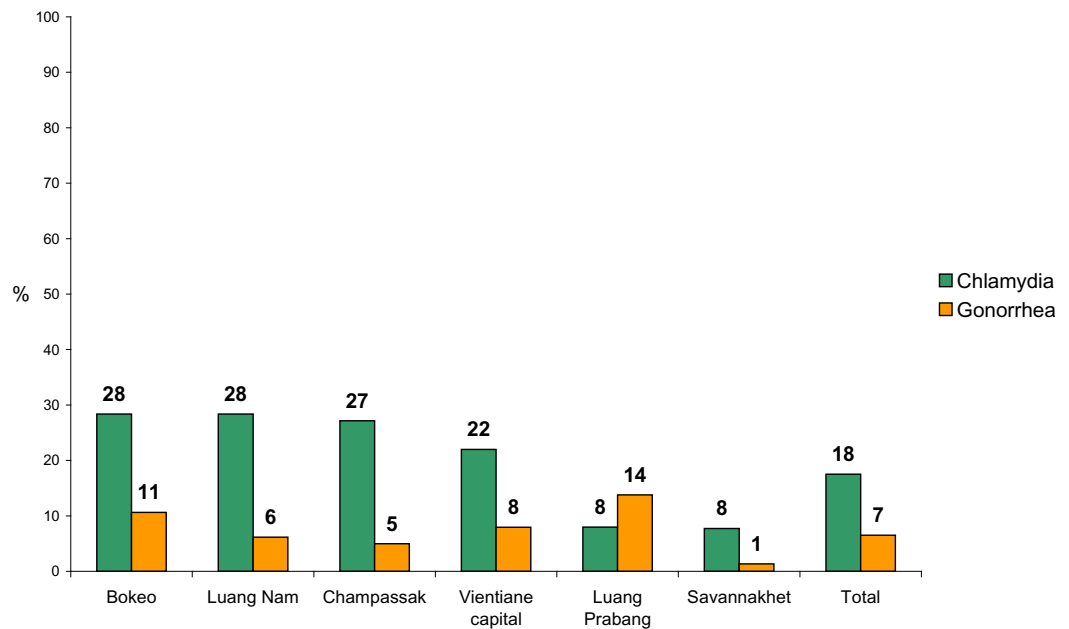


5.2. Chlamydia and gonorrhoea among service women

5.2.1. Prevalence

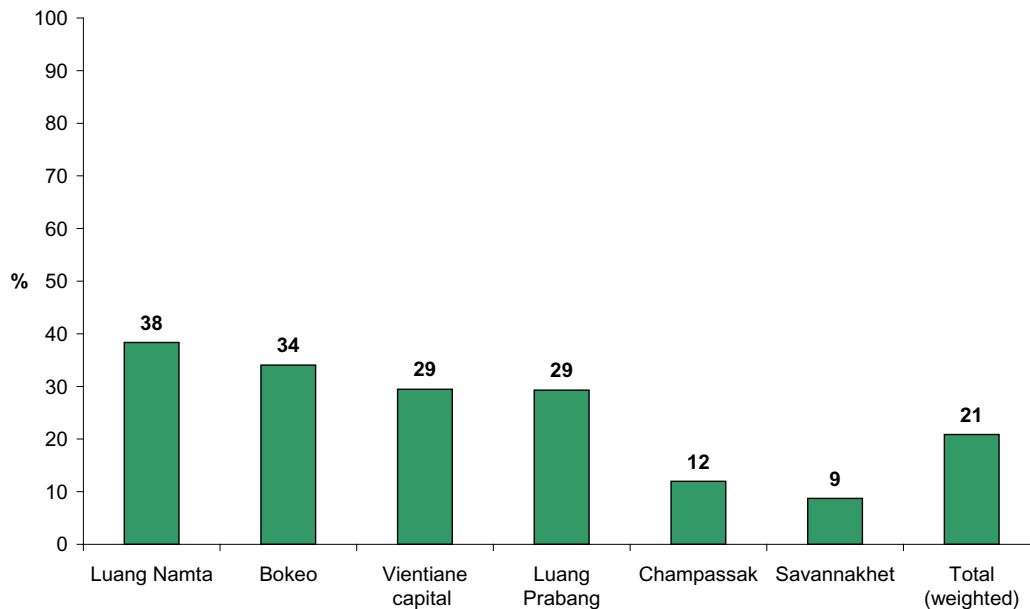
The prevalence of chlamydia among service women was 18% and the prevalence of gonorrhoea was 7%. Chlamydia was more frequent than gonorrhoea in all provinces except for Luang Prabang.

Fig 11: Prevalence of chlamydia and prevalence of gonorrhoea among service women in 2008, by province (Weighted data)



More than 1/3 of the service women were infected with Chlamydia or gonorrhoea in Luang Namtha and Bokeo, justifying for intensified efforts to control STI in these provinces where service women have less benefited from presumptive treatment programs. Champassak and Savannakhet displayed a substantially lower prevalence of Chlamydia or gonorrhoea than other provinces.

Fig 12: Prevalence of chlamydia and/or gonorrhea among service women in 2008, by province

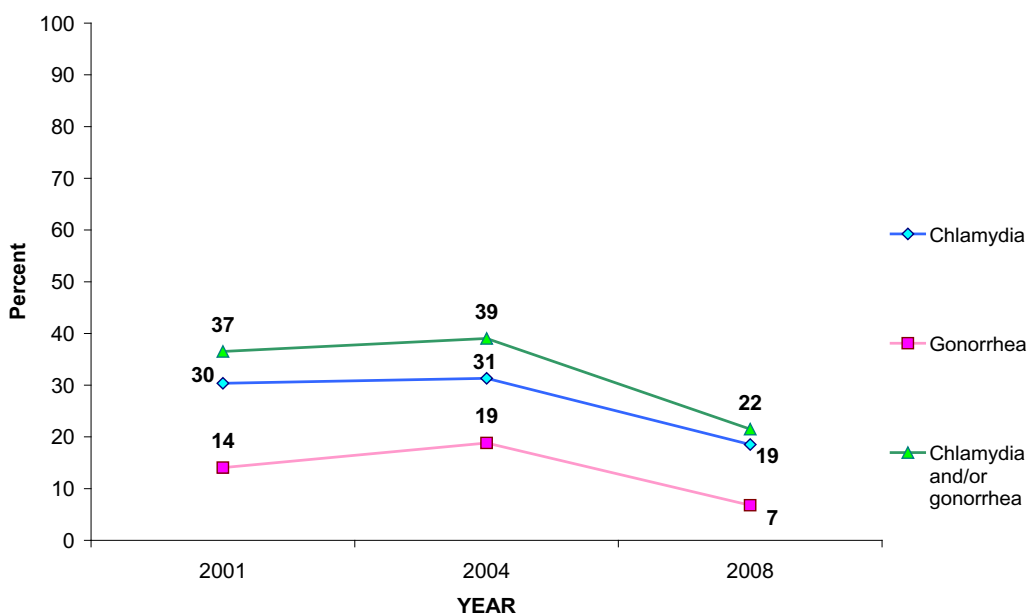


5.2.2. Trends in prevalence

STI trends were constructed after restricting the sample to provinces surveyed in all three rounds of IBBS, (including Vientiane, Savannakhet and Luang Prabang). Therefore the estimates reported in this chapter are not comparable to overall estimates presented above. Data were weighted to account for service women population size in each city.

The trends in prevalence of Chlamydia and gonorrhea presented in Figure 13, show that the prevalence of these two STI has remained unchanged between 2001 and 2004 but decreased substantially from 2004 to 2008. Changes in treatment strategy (including implementation of preventive presumptive treatment and opening of drop-in centers providing treatment to service women) as well the increase in condom use observed with both clients and casual partners are likely to have caused this success.

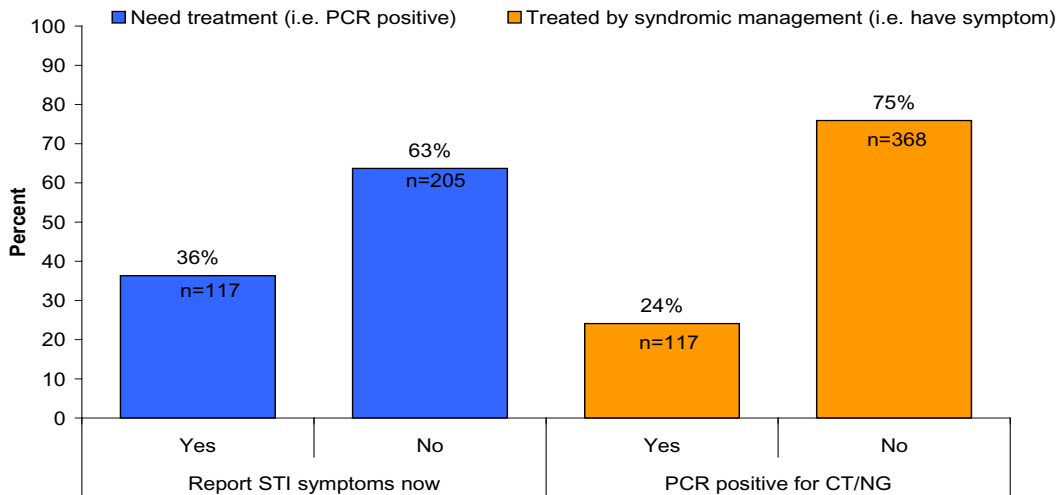
Fig 13: Trends in prevalence of chlamydia, gonorrhea, and chlamydia and/or gonorrhea among service women



5.2.3. Implications for treatment strategy among service women

Figure 14 shows the proportion of service women infected with CT/NG who reported symptoms as well as the proportion of service women reporting symptoms who are infected with CT/NG. According to guide lines, those reporting symptoms would receive treatment when a syndromic management of STI is implemented. Figure 14 shows that only 36% of those treated when using a syndromic approach actually need the treatment. Moreover only 24% of those in need of treatment (i.e. those with positive PCR for CT/NG) get treated when using the syndromic approach. The findings show that syndromic management of STI is not appropriate for sex workers with high prevalence of CT/NG. With the current prevalence of CT/NG among service women, syndromic management of STI leads to poor rate of case detection and over treatment.

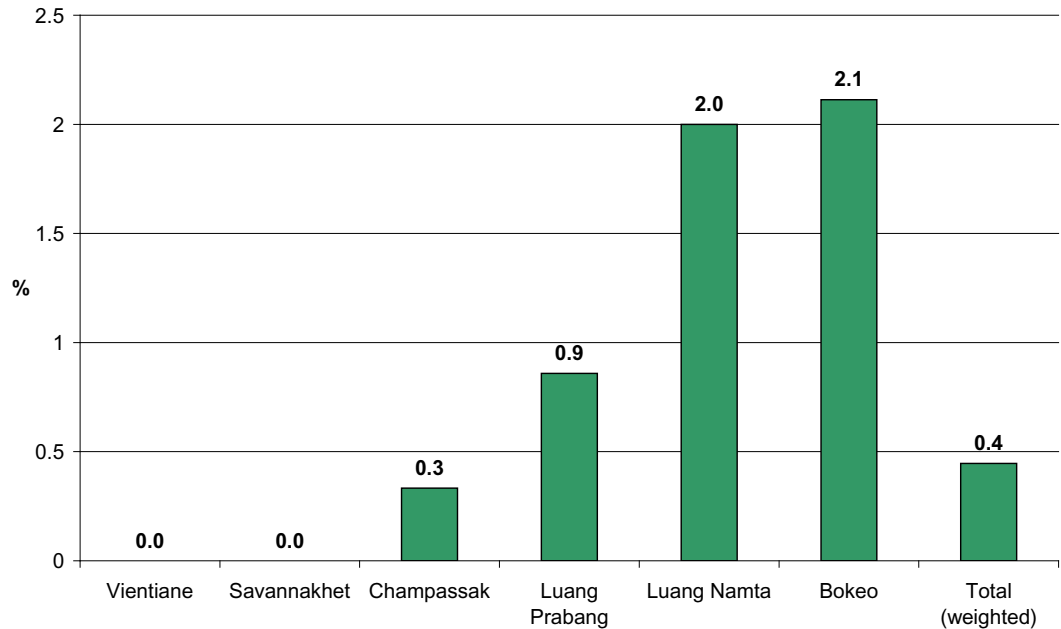
Fig 14: Comparison of reported symptoms of STI and STI detected through PCR among service women



5.3. Syphilis

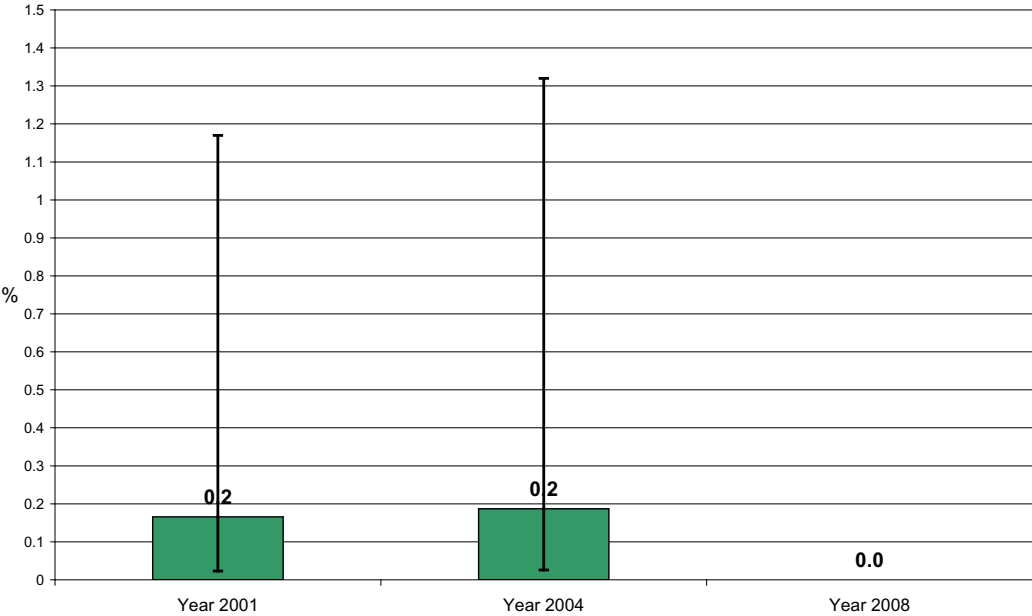
The methodology used for the testing of syphilis was a screening RPR test with confirmation of the positive using a specific treponemal test (TPPA). This standard methodology does not differentiate recently treated syphilis from active syphilis, which equals to approximating life time exposure to syphilis. The prevalence of life-time syphilis by province is presented in figure 15. Despite the absence of systematic testing of syphilis in STI control programs in Lao PDR, the prevalence is low in most provinces. The higher prevalence of syphilis observed in Luang Namtha and Bokeo translate the poor level of consistent condom use with clients reported by service women in these provinces.

Fig 15: Prevalence of life-time exposure to syphilis among service women, by province



The trend in prevalence of syphilis among service women was constructed for the two provinces that consistently had syphilis prevalence estimates since 2001 (i.e. Vientiane and Savannakhet) (Figure 16). Only one case of syphilis was detected in 2001 and 2005, respectively. No case of syphilis was detected in these two provinces in 2008, which may be due to the random selection of participants. This trend suggests that syphilis is not an endemic disease among service women in Lao PDR.

Fig 16: Trends in prevalence of syphilis among service women from 2001 to 2008, by province





VI. Conclusion

6.1. Service women

Service women are female sex workers characterized by a low number of clients, a short duration of selling sex and a high level of condom use. Condom use with both clients and non-commercial non-regular partners has dramatically increased since 2004. These specificities largely explain why the prevalence of HIV has not increased in this group of female sex workers and may even be decreasing. Fortunately, very few service women use drug and when they do, they do not inject.

Service women are young and young women are biologically more vulnerable to STI than their peers. STI prevalence serves as a biological proxy for unprotected sex. The prevalence of STI among service women has dramatically decreased in provinces where periodic presumptive treatment (PPT) was implemented, which provinces also achieved a high level of condom use in commercial sex. In provinces with less rigorously implemented PPT and low condom use (e.g. Luang Namtha and Bokeo) the prevalence of STI remained high. Although the prevalence of STI among service women decreased since 2004 it still remains relatively high. Continuation of PPT is required to address SW high turnover and the substantial proportion of asymptomatic women with STI. The increase in uptake of STI clinical services related to the opening of sex workers' dropping centers is noteworthy. These clinical services proposing a clinical and syndromic approach of STIs are needed to address the needs of symptomatic SW who remain in the job for a lengthy period of time.

The short duration of working at a specific place as well as the short duration of selling sex requires intensified prevention which is highlighted by the insufficient knowledge of HIV transmission reported by the majority of service women. Although condoms appear accessible, few women purchase their own condoms and most get their condoms from prevention projects or drink shop managers. Establishment managers should be targeted by condom promotion program in order to ensure widespread access to condom and increase protection of service women from their very first days working in

the sex trade industry. High level of reported condom breakages suggest that condoms may be expired or some service women do not use condoms adequately, which justifies regular training with hands on condoms. Prevention messages should include messages to reduce the habit of douching with any kind of chemical, which practice disrupt the natural vaginal flora and erode the mucosal barrier.

6.2. Electricity workers

State enterprise electricity workers is a group of middle aged men that does not change much over time as there is few recruitment every year to replace those who retire. These men with salary are a good proxy for clients of sex workers as half sex with a female sex worker in the past year and about a quarter of these men visit female sex workers on a regular basis. About a quarter of these men also had sex with a non-commercial non-regular partner in the past year.

In this male surveillance group, the prevalence of HIV has not increased since 2004. When electricity workers purchase sex it is in most instances at a drink shop, which remain the main facility providing of commercial sex in Lao PDR. They report high level of condom use in commercial sex that is consistent with that reported by service women. However, some use two condoms on the top of one another could possibly cause condom breakage. Knowledge of HIV transmission is intermediate due to widespread misconceptions that could trigger discrimination against people living with HIV.



VII. Recommendations

- Coordination of prevention programs is needed to minimize geographical overlap between similar interventions.
- Knowledge of HIV transmission, service women from Champassak, Bokeo and Luang Prabang remains insufficient. Education interventions to SW are required to improve their knowledge of HIV transmission.
- Drop-in centers increase service women's access to and utilization of STI care services. Scaling-up of drop-in centers providing STI check-up to service women, their clients is needed.
- Periodic presumptive treatment has been successful at reducing STI prevalence among SW in Lao PDR, which advocates for its continuation. It should be intensified in provinces such as Bokeo and Luang Namtha, where it was conducted less rigorously.
- Lifetime use of HIV testing services remains low, requiring promotion and scaling-up of testing services.
- Service women practice frequent vaginal douching that may alter their natural protection to infections. Education about vaginal douching and sex during menstruation should be included in prevention information delivered to service women.
- The high levels of reported condom breakages should be investigated. Studies on condom quality, SW knowledge on proper use of condoms, and assessments of condom storage could provide some explanations to frequent condom breakages.
- Due to the stability of their population and in the absence of growing HIV epidemic among female sex workers, electricity workers do not need to be surveyed in the near future (i.e. next four years).
- The high frequency of reporting misuse of condoms (use of multiple condoms at a time) among clients of SW, information to the general population on proper use of condoms is needed.
- Mass media campaign explaining modes of HIV transmission would help reducing misconceptions about HIV transmission and in turn reduce discrimination to people living with HIV.

LIST OF TABLES

Table 1: Expected sample size by province and survey group	5
Table 2: Sample size of second generation surveillance round-2 among service women, by province.....	10
Table 3: Demographic characteristics among service women	11
Table 4: Sexual initiation and reproductive health among service women	12
Table 5: History of selling sex history and establishments characteristics	13
Table 6: Number and type of sexual partners reported by service women	14
Table 7: Characteristic of last client of service women	15
Table 8: Access to condoms.....	17
Table 9: Use of male condoms by type of partners.....	18
Table 10: Knowledge, attitudes and behaviors towards female condoms	19
Table 11: Reported violence from clients.....	20
Table 12: Vaginal douching and sex during menstruation among service women	20
Table 13: Knowledge of HIV transmission among service women	21
Table 14: Service women currently reporting symptoms and frequency of visits for STI checkup in the past 3 months	22
Table 15: Use of HIV testing services among service women	22
Table 16: Coverage of prevention interventions to service women.....	23
Table 17: Drug use and alcohol intake among service women.....	24
Table 18: Demographic characteristics of electricity workers	27
Table 19: Sexual behaviors among state enterprise electricity workers ..	28
Table 20: Access to condoms and use of condoms among sexually active state enterprise electricity workers.....	29
Table 21: Purchase of sexual services among sexually active state enterprise electricity workers.....	30
Table 22: Knowledge of HIV transmission among state electricity workers	31
Table 23: Male electricity workers' reporting of STI symptoms and uptake of STI services at last STI episode which occurred in the past three months	32
Table 24: Knowledge and uptake of HIV testing among electricity workers	33
Table 25: Coverage of prevention intervention to electricity workers.....	33
Table 26: Intake of intoxicants among electricity workers	34



LIST OF FIGURES

Fig 1: Nationality of last client.....	16
Fig 2: Trends in selling sex and condom use at last sex with clients and casual partners.....	25
Fig 3: Trends in first source of treatment at last STI symptom among service women	26
Fig 4: Comparison of 2004 and 2008 data for electricity workers' sexual activity with FSW past month and casual partners past year.....	34
Fig 5: Trends in condom use at last sex with female sex worker and casual partners.....	35
Fig 6: Results of HIV testing among service women	36
Fig 7: Results of HIV testing among electricity workers.....	37
Fig 8: HIV prevalence by surveillance group	38
Fig 9: HIV prevalence estimates among service women in 2008, by province	39
Fig 10:Trends in HIV prevalence by risk groups (weighted for service women)	40
Fig 11:Prevalence of chlamydia and prevalence of gonorrhea among service women in 2008, by province (Weighted data).....	41
Fig 12:Prevalence of chlamydia and/or gonorrhea among service women in 2008, by province.....	42
Fig 13:Trends in prevalence of chlamydia, gonorrhea, and chlamydia and/or gonorrhea among service women	43
Fig 14: Comparison of reported symptoms of STI and STI detected through PCR among service women.....	44
Fig 15:Prevalence of life-time exposure to syphilis among service women, by province.....	45
Fig 16:Trends in prevalence of syphilis among service women from 2001 to 2008, by province	46

SURVEILLANCE TEAM

Advisory teams:

Dr Chansy Phimpachanh Director of CHAS¹,
Dr. Phouthone Southalack, Deputy Director of CHAS¹,
Dr. Chanthone Khamsibounheuang, Deputy Director of CHAS¹
Dr. Khanthong Bounlue, Deputy Director of NCLE²

Central supervisors:

Dr. Sisavath Manivong, Head of Sureveillance Unit¹,
Dr. Khanthanouvieng Xayabounthavong, Head of STI Unit¹,
Dr. Ratthiphone Oula, Deputy Head of STI Unit¹
Dr. Thongchanh Sisouk²
Dr. Dalouny Phonekeo²
Mr. Khampeuy²

Field supervisors:

Dr. Amphone Philaket¹
Dr. Ketmala Banchongphanith¹
Dr. Panina Phoumsavanh¹
Dr. Souphanthong Manichanh¹
Dr. Chanhom Phiaphivong¹
Dr. Vanvilay Sphabmixay¹
Dr. Phouthaly Keomoukda¹
Dr. Chanthasouk Bansalith¹
Dr. Khanti Thongkham¹
Ms. Southaphone Chittaphong¹
Mr. Vimatha²
Dr. Vilasack Somoulay²
Dr. Khampheng²

Data collection teams:

Bokeo Province:

- Dr. Khamla Yaihiengone³
- Ms. Khammanh³
- Ms. Phouthone³
- Ms. Ketchanh³
- Ms. Souchitta³
- Ms. Pinkham³

LuangNamtha Province:

- Ms. Dengthong³
- Ms. Khambang³
- Ms. Thoumy³
- Ms. Monekham³
- Ms. Somphone³
- Ms. Sonthaya³

Luang Prabang province:

- Dr. Thongsavath Sayasane³
- Dr. Khamphou Sisouphanh³
- Ms. Bounkhong³
- Ms. Phetsamone³
- Ms. Chittaphone³
- Ms. Manisouk³
- Ms. Baily Souksavath³
- Dr. Dalavone³
- Mr. Viradeth³
- Ms. Chanboun Yengvue^{3a}
- Ms. Nitthaphone³
- Ms. Alounsavath³
- Ms. Manivone³
- Dr. Houmphanh³
- Ms. Somphone³
- Ms. Oulaykham³
- Mr. Phithoune³
- Mr. Longher³

- Ms. Phonesanith³

Vientiane Capital:

- Dr. Phonepaseuth³
- Dr. Lavanh Vongsavanthong³
- Dr. Manivanh³
- Ms. Chansamone³
- Ms. Sengkeo³
- Dr. Sengpachanh³
- Mr. Phanhnouvong³
- Dr. Banchai³
- Dr. Phitsamai³
- Ms. Malay phone³
- Dr. Phaphone³
- Ms. Bouakham³
- Ms. Davone³
- Dr. Boualavanh³
- Dr. Chanthaphone³
- Mr. Thanomsouk³
- Mr. Oudom³
- Ms. Phouthasone³
- Dr. Bouchom³
- Mr. Konglack³
- Ms. Savivone³
- Mr. Khamphaseuth³
- MA. Pavy³
- Dr. Sisana³

Savanakhet province:

- Dr. Khetsaphone Ngativong³
- Dr. Vathsana Sopraseuth³
- Mr. Norkeo³
- Ms. Somvang³
- Ms. BangOne³
- MD. Phouthone³
- Dr. Khonesavanh³

- Ms. Napha³
- Mr. Kongphanh³
- Ms. Sodavanh³
- Ms. Khamphouphan³
- MD. Somnuk³
- MD. Pathoumma³
- MD. Soulivong³
- Mr. Somsanouk³
- Mr. Nonethasane³
- MD. Korlakane³
- MD. Veunema³
- Dr. Sengpheth³

Champassak Province:

- Dr. Somchai³
- MD. Phoukhong³
- Dr. Somsanith³
- MD. Latsamy³
- MD. Bouasone³
- Mr. Khampasong³
- Ms. Khampieng³
- Ms. Phaiboune³
- Dr. Ketkeo³
- MD. Phanthavanh³
- Dr. Southakaysy³
- MD. Manisone³
- MD. Khammy³
- MD. Bannalay³
- MD. Vathsana³
- MD. Kai amphone³
- MD. Soumalai³
- MD. Bounyong³

Technical assistance

Dr Guy Morineau, Family Health International

Note: 1. CHAS (Center for HIV/AIDS/STI)

2. NCLE (National Laboratory and Epidemiology Center)

3. PCCA (Provincial Committee for the Control of AIDS)

