

RTI/STI Prevalence in Selected Sites in the Philippines

Department of Health

**Women's Health and Safe Motherhood Project
National AIDS/STD Prevention and Control Program
Philippine National AIDS Council Secretariat**

Family Health International



RTI/STI PREVALENCE IN SELECTED SITES IN THE PHILIPPINES

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and to all our RESPONDENTS for generously sharing with us their time.

ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BV	Bacterial Vaginosis
BTL	Bilateral Tubal Ligation
CA	<i>Candida albicans</i>
CDC	Centers for Disease Control and Prevention
CT	<i>Chlamydia trachomatis</i>
DOH	Department of Health
FETP	Field Epidemiology Training Program
FHI	Family Health International
FSW	Female Sex Worker
GC	<i>Neisseria gonorrhoeae</i>
GUD	Genital Ulcer Disease
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
HBV	Hepatitis B Virus
HSV	Herpes Simplex Virus
IMPACT	Implementing HIV/AIDS Prevention and Care Project
IUD	Intra-uterine Device
KOH	Potassium Hydroxide
MSM	Men who Have Sex with men
MSW	Male Sex Worker
N	Number
NASPCP	National AIDS/STI Prevention and Control Program
NFP	Natural Family Planning
NGO	Non-government Organization
NSC	Non-specific cervicitis
OPD	Out Patient Department
OB/GYN	Obstetrics and Gynecology
PCHRD	Philippine Council on Health, Research and Development
PCR	Polymerase Chain Reaction
PMNL	Polymorphonuclear Leukocyte
PNAC	Philippine National AIDS Council
RHC	Rural Health Center
RHU	Rural Health Unit
RPR	Rapid Plasma Reagin
RTI	Reproductive Tract Infection
SACCL	STD/AIDS Cooperative Central Laboratory
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
STM	Specimen Transport Medium
SW	Sex Worker
TPPA	<i>Treponema pallidum</i> Particle Agglutination
TV	<i>Trichomonas vaginalis</i>
WHMMP	Women's Health and Safe Motherhood Project

ABSTRACT

Objectives: This study aimed to estimate the magnitude of the STI problem in the general population and to provide data to improve RTI/STI case management guidelines.

Methodology: The study was a cross sectional clinic-based survey among women and men in the general population (GP) and the youth. Consenting individuals were recruited in health facilities within the selected sites until the required number of samples was reached. Participants were interviewed using a standard questionnaire. Cervical and vaginal specimens were collected from females while urine samples were collected from males and youth subjects. Cervical specimens were tested for *N. gonorrhoea* (NG) and *C. trachomatis* (CT) using polymerase chain reaction (PCR). Vaginal specimens were tested for *T. vaginalis* (TV) using culture; *Candida albicans* (CA) through wet mount and bacterial vaginosis (BV) using the nugent criteria. Urine samples were tested for *N. gonorrhoea* and *C. trachomatis* using PCR. Blood samples were also collected for syphilis (Sy) detection using Rapid Plasma Reagin (RPR) and confirmed by Treponema Pallidum Particle Agglutination (TPPA) and hepatitis B (HB) using rapid immunochromatography.

Results: The prevalence of STIs among women are as follows: NG – 0.75%; CT – 5.75%; TV – 3.18%; CA – 17.16%; BV – 28.56%; Sy – 0.17% and HB – 3.2%. Among males NG was 1.1%, CT – 4.4%; Sy – 0.2% and HB – 9.6%. NG was 0.7% among female youth and 7.7% for CT. Among male youth NG was 1.7% and CT – 9%. Thirty-one percent of females and 88% of males were asymptomatic for infection. Majority of respondents were monogamous during the past 6 months. Five females (0.2%) and 90 (7.5%) of males (GP) while 49 (16%) of youth males revealed to have exchanged sex for money. Twenty-seven (2.2%) of males (GP) and 25 (8%) of male-youth reported to have sex with a commercial sex partner. Condom use was low across all groups.

Discussion/Conclusion: The study revealed that STI prevalence, particularly genital ulcer disease, remains low in the general population in the Philippines. However, young people have relatively high prevalence of genital chlamydial infection. The study also demonstrated moderately high prevalence of established risk behaviors such as men having unprotected commercial sex encounters. There is a need to provide new approaches and strengthen current STI interventions to sustain the low STI rates and lower chlamydial infections. The foregoing findings revealed that majority of the STI cases are asymptomatic. Since current laboratory tests are expensive and simple and cheap laboratory tests are still unavailable, there is a need to develop a strategy to reach and treat asymptomatic STI cases.

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I. INTRODUCTION

Despite the ability to cure reproductive tract infections (RTIs), including sexually transmitted diseases (STIs), they continue worldwide to be a major public health problem. RTI/STI cause serious health, economic and social consequences. In recent years, studies have shown that persons with STI have an increased risk of acquiring HIV¹. RTI/STI are important not simply because they can cause acute symptoms such as genital ulcers and discharges but because they can have damaging long-term effects on health such as chronic pain, male and female infertility, cervical cancer, and damaging effects on the fetus and newborn child². This is compounded by the fact that many STI are asymptomatic in both men and particularly women making their detection complex.

The advent of HIV, which is sexually transmitted in an estimated 80% of cases, has redoubled the need to prevent and treat STIs.

Several *ad hoc* surveys have shown high rates of STI among high-risk groups as shown in Tables 1 and 2. In addition, data on the general population are limited. Trends overtime cannot be measured because these surveys were conducted using different methodologies, laboratory standards, target populations, and sample sizes.

¹ UNAIDS/WHO Consultation on STD Interventions for Preventing HIV: What is the evidence? UNAIDS/00.06E_WHO/HS1/2000.02.Geneva, 2000

² Fleming, DT; Wasserheit, JN, From epidemiological synergy to public health policy and practice; The contribution of other sexually transmitted diseases to sexually transmitted HIV infection, Sex Transm Infect 1999; 75: 3-7

Table 1. PREVALENCE STUDIES ON SEXUALLY TRANSMITTED INFECTIONS (STI) AMONG HIGH RISK GROUPS

STI	MONZON (1991)		FHI (1994)		AGDAMAG (1996)	APLASCA (1998)			FHI (1999)		
	MANILA		MANILA	CEBU	MANILA	BAGUIO	CEBU	DAVAO	ANGELES CITY		
TARGET POPULATION	FSW	MSW	FSW	FSW	FSW	FSW	FSW	FSW	FSW	MSM	CLIENT OF SW
SAMPLE SIZE	936	421	311	297		295	348	300	450	100	100
Gonorrhea	14.5	3.1	10.6	22.2		2.7	3.5	3.3	25	1	1
Chlamydial Infection	13		17.3	22.7	15.5				36	12	16
Trichomoniasis	3.8	-	6.7	30.9		12.2	29.3	0	6	1	1
Candidiasis	5.2	-	4.8	-							
Bacterial Vaginosis	0.2	-	11.6	-					64		
Syphilis	2.2	1.4	2.8	6.7		1	2.8	0.7	12	2	5
Herpes Genitalis	0.9	-	0	0							
Genital Warts	2.1	2.6	0	0							

Table 2. PREVALENCE STUDIES ON STI AMONG LOW RISK GROUPS

STI	FHI (1994)	AGDAMAG (1996)	APLASCA (1998)			APLASCA (1998)		
	MANILA	MANILA	BAGUIO	CEBU	DAVAO	BAGUIO	CEBU	DAVAO
TARGET POPULATION	ANTENATAL WOMEN	FP CLIENTS	ANTENATAL WOMEN			POLICEMEN		
SAMPLE SIZE	203		308	343	349	349	343	349
Gonorrhea	1		0	0.3	0.6	0.2	0	0.5
Chlamydial Infection	5.6	2.5	11.7	9.6	7.5	4.6	2.1	2.3
Trichomoniasis	0.5		1	2.3	4			
Candidiasis	10.3							
Bacterial Vaginosis	11.3							
Syphilis	1		0	0.6	0.3	0	0.3	0

A wide range of information is needed to appropriately direct and effectively manage the national and local STI program. The required information includes data on the magnitude of the problem, frequency and distribution of STI, including the distribution of the individual pathogens and antimicrobial sensitivity, and data on the determinants of risk behavior, health care seeking behavior and trends overtime. Information on the magnitude of the RTI/STI problem will help define the resources needed and can be used to raise awareness among decision-makers to obtain the necessary support. Measuring the frequency, distribution and antimicrobial sensitivity of STI pathogens will also define how to appropriately target and revise diagnostic and therapeutic national guidelines.

In the Philippines, aside from the behavioral and HIV sentinel surveillance data, reliable STI data are rarely collected. The current monitoring of STI using syphilis screening in the national HIV surveillance system, clinic caseload reports from the social hygiene clinics, and minimal *ad hoc* STI surveys, is inadequate to describe the prevalence and trends of the most common RTI/STI in the Philippines.

In order to help maintain low HIV prevalence in the Philippines and to improve reproductive health among both men and women, it is imperative to obtain a more accurate understanding of the magnitude of the RTI/STI problem in the Philippines, to monitor RTI/STI trends accurately, and to reduce infections to the lowest levels possible.

II. OBJECTIVE:

This study aims to estimate the magnitude of the STI problem in the general population and to provide data to improve RTI/STI case management guidelines.

More specifically it will:

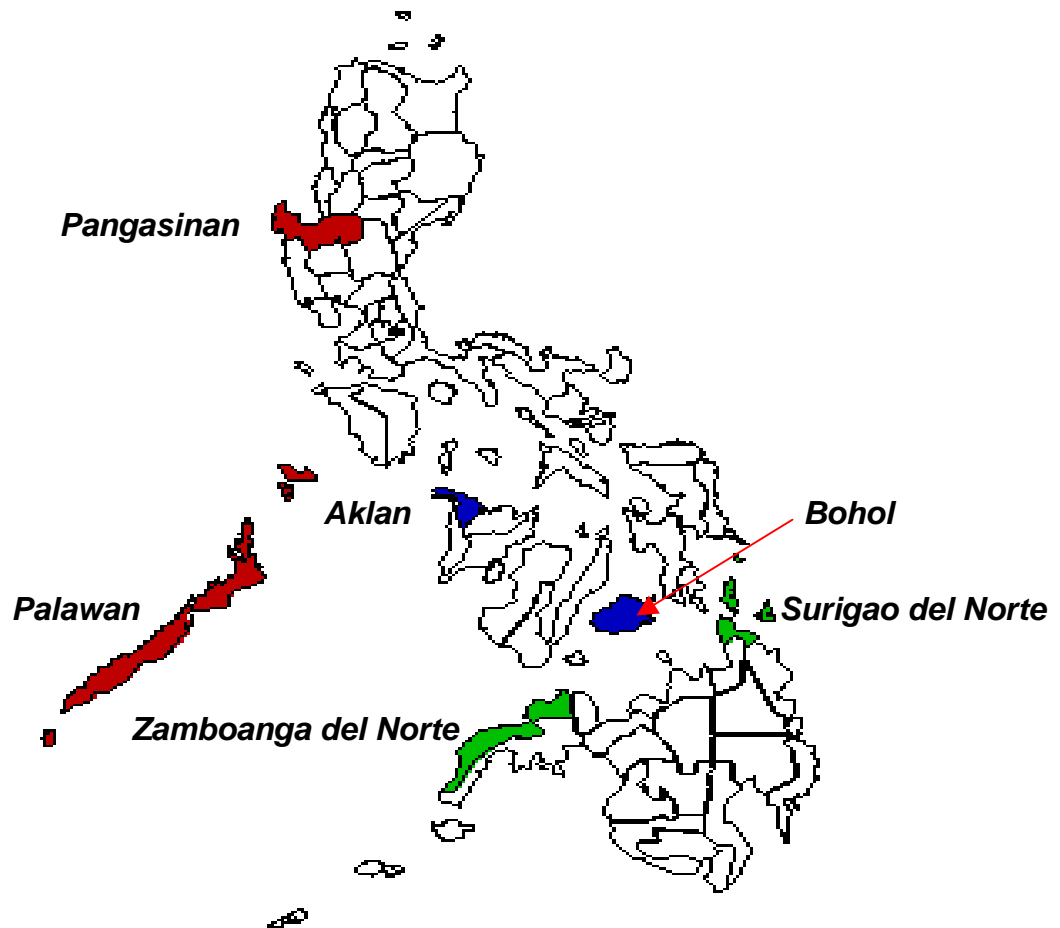
1. Determine the prevalence of *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, *Treponema pallidum*, bacterial vaginosis and *Candida albicans* among women in 6 selected sites in the Philippines.
2. Determine the prevalence of *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and *Treponema pallidum* among men in 6 selected sites in the Philippines.
3. Determine the prevalence of *Neisseria gonorrhoea* and *Chlamydia trachomatis* among young women and young men in two selected provinces in the Philippines.
4. Determine the prevalence of *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, *Candida albicans* and bacterial vaginosis among women with symptomatic vaginal discharge and lower abdominal pain.
5. Determine the prevalence of *Neisseria gonorrhoeae* and *Chlamydia trachomatis* among men with symptomatic urethral discharge.
6. Determine the prevalence of *Haemophilus ducreyi*, genital herpes and *Treponema pallidum* among men and women with genital ulcers.
7. Measure the frequency of risk behaviors and the associations between risk behaviors and current infection with or prevalence of STI among women and men in the general population.
8. Measure the frequency of risk behaviors and the associations between risk behaviors and exposures to STI among young women and young men.

III. METHODS:

A. SITE:

Study sites were selected based upon urban and rural representation, high and low income, presumably high and low STI prevalence and geographical and socio-cultural representation of the 3 widely separated geographic areas in the Philippines. The study was implemented in 2 sites from each of the 3 geographic areas. These 6 sites were chosen from the Women's Health and Safe Motherhood Project's RTI provinces. Sites included: Luzon (Palawan and Pangasinan), Visayas (Aklan and Bohol), Mindanao (Zamboanga and Surigao del Norte).

**Figure 1. Sites of the RTI/STI Prevalence Survey
February to May 2002**



B. SAMPLE SIZE:

Women:

The sample size for women recruited was calculated based on the following estimated prevalence rates: gonorrhea of 1%, chlamydial infection of 5%, trichomoniasis of 1%, bacterial vaginosis of 10%, syphilis of 1% and candidiasis of 5%. Taking into consideration the highest RTI/STI prevalence of 10% with a precision of +/-3%, and a 95% degree of confidence, the sample size was 385 per site. To account for specimen loss, contamination and indeterminate test results, sample size was rounded to 400 per site.

Men:

The sample size for men recruited was calculated based on the following estimated prevalence rates: gonorrhea of 1%, chlamydial infection of 4%. Taking into consideration the highest RTI/STI prevalence of 4% with a precision of +/-3%, and a 95% degree of confidence, the sample size was 164 per site. To account for specimen loss, contamination and indeterminate test results, sample size was rounded to 200 per site.

Youth:

An additional of 600 samples was made based on the premise that younger women and men have higher STI prevalence. Since no data are available for younger women and men, the assumption for the sample size computation included: A population size of 1,000,000 with a 50% expected frequency of gonococcal and chlamydial infection, 45% worst acceptable frequency with 95% confidence.

Total: 4,200

Women: 2,400 (400/site x 6 sites)

Men: 1,200 (200/site x 6 sites)

Youth: 600 [(300/site x 2 sites); 150 males and 150 females]

C. CRITERIA FOR PARTICIPATION:

Inclusion Criteria

All sexually active men and women who were attending the health facilities in the selected study sites were eligible to participate in the study as follows:

Women:

- Age 15 – 49
- Without evidence of vaginal bleeding

Men:

- Age 18 – 65

Youth (male):

- Age 18 – 24

Youth (female):

- Age 15 – 24
- Without evidence of vaginal bleeding

Exclusion Criteria

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

General Population:

- Women below 15 years of age, and men below 18 years of age
- Women and men under the influence of drugs and alcohol
- Lack of informed consent
- Previous antibiotic use in the past 2 weeks

Youth:

- Young women below 15 years and young men below 18 years of age
- Young women and men under the influence of drugs and alcohol
- Lack of informed consent
- Previous antibiotic use in the past 2 weeks

D. STUDY DESIGN

This was a cross sectional clinic-based survey among women and men in the general population. Consenting women and men were recruited in health facilities within the selected sites until the number of samples was reached.

Women were recruited from the rural health units, hospital out patient department's (OPD), family planning, antenatal and OB/GYN clinics.

Men were recruited in rural health units, medical clinic of the hospital out patient departments and blood banks.

Younger women and men were recruited in school-based clinics and other youth-based organizations in the community.

Family Health International assumed the main responsibility for the conduct of the study. However, activities were carried out in collaboration with local public and private health facilities in the study sites. The study was also used to increase the capacity of all study collaborators (clinicians, laboratory and data management personnel) in the use of appropriate research methods and strategies as well as in broader STI control issues.

Data Collection

To ensure quality data collection, coordinators conducted field editing. Likewise, they made spot checks and verified the work of the facility study health care workers. Daily results were reviewed and erroneous data were rectified.

E. CLINIC PROCEDURES:

All patients who met the subject inclusion criteria were invited to participate in the study. The study health care worker obtained informed consent in private at the health facility. The purpose and procedures of the study were explained in

simple and understandable terms. The potential participants were informed that all information and discussions would remain confidential; their participation was voluntary; that they could refuse to answer any questions; and that they could leave the study at any time. They were also informed that their participation or non-participation would not affect the treatment they would normally receive. The potential participant was then asked to explain the procedures of the study back to the study health care worker to ensure they understood. After the study had been explained, patients who signed a consent form and agreed to return to the clinic for the follow-up examination after 3 to 7 days were enrolled in the study.

The patient was then taken to a separate private room where confidentiality could be assured, and where a study health care worker (HCW) conducted an interview and risk assessment while a physician of the same sex, trained in the procedures of the study, performed a physical examination and collected specimens. The following were performed:

1. Interview and risk assessment:

Using a standard interview schedule, the study HCW interviewed the patient in his/her own language. Questions included information regarding demographics, social, sexual behavior and past and present medical history. For women, the risk assessment questions in the national flowchart were included together with additional risk assessment questions. Potential risk behaviors of partners and perceptions of women regarding risky behavior of partners were also asked.

2. Physical examination and specimen collection

The physical examination and specimen collection were done in a private examining room by a trained physician of the same sex to minimize anxiety and consequent physical discomfort. Standard clinical practice and use of sterile medical supplies and equipment were ensured.

For men:

- An external inspection of the genital area, noting the characteristics of any local changes such as erythema, abrasions, ulceration, warts and urethral discharge, was made;
- In the absence of visible urethral discharge, the patient was asked to milk the urethra. The characteristics of any discharge were noted;
- With a cotton wool swab, a specimen of discharge was obtained at or just within the urethral meatus for Gram staining. This was used for the detection of *N. gonorrhoeae* and for counting polymorphonuclear leukocytes (PMNLs);
- If genital ulceration was found, the number and characteristics were noted. A swab was obtained from the ulcer and inoculated in a transport medium, stored at –20 degrees and referred to the Centers for Disease Control and Prevention, Atlanta Georgia (CDC) for Polymerase Chain Reaction (PCR) testing for *H. ducreyi*, Herpes Simplex Virus (HSV) and *T. pallidum*;
- A first catch of urine specimen was collected for PCR testing for NG/CT. The urine specimen was stored in cold packs, handled and transported as indicated in the manufacturer's instructions;
- Five ml of blood was drawn for syphilis and hepatitis B surface antigen serology.

For women:

- An external inspection of the genital area was made, and the characteristics of any local changes such as erythema, abrasions, ulceration, and vaginal discharge were noted.
- A duck-billed speculum was introduced using only distilled water as lubricant. Any abnormality of the vaginal walls or vaults was noted, e.g. erythema or ulceration of the vaginal wall, rashes, erythema or excoriation of the vulva or introitus. The presence and characteristics

of the vaginal discharge was likewise noted including color, amount, odor, consistency and density.

- A pH strip was placed in the discharge either at the lateral or posterior vaginal fornix and the pH noted. Alternatively the pH was measured in the vaginal discharge remaining on the speculum after withdrawal;
- A sample of vaginal fluid from the posterior fornix using three cotton swabs was collected exercising care to avoid collecting cervical secretions.
 - One cotton swab was placed on a slide for Gram staining of the vaginal discharge and read for the presence of bacterial vaginosis using the Nugent criteria³.
 - Another swab was placed on a slide for wet mount examination to detect the presence of motile flagellates (*T. vaginalis*) and clue cells for bacterial vaginosis, KOH mount for the presence of pseudohyphae for *C. albicans* and whiff test.

(The Whiff Test. A sample of vaginal discharge/secretion was obtained on a swab from the vagina (or from the speculum after removal) placed on a slide that has a drop of 10% potassium hydroxide (KOH) solution. The presence or absence of an ammoniacal (fishy) odor was noted, suggestive of bacterial vaginosis.)

- The other cotton swab was inserted into the Trichosel® medium in a Bijon® bottle. The swab was broken off into the medium.
- Any clinical cervical abnormality was noted, e.g. warts, cervical ectopy or erosion; mucopus or pus leaking from the cervical os;
- With a large cotton wool swab, the surface of the cervix, particularly the cervical os was carefully cleaned. Any remaining vaginal discharge was mopped up as the swab was withdrawn;
- After cleaning of the cervical os, a swab was then introduced into the endocervical canal until only the base of the cotton wool was visible,

³ Nugent RP, Krohn MA, Hillier SL. The reliability of diagnosing bacterial vaginosis is improved by a standardized method of Gram stain interpretation. *J Clin Micro* 1991;29:297-301.

rotated for 3-5 seconds, removed and immediately placed in the specimen transport medium (STM), with vigorous swirling of the swab for 15 seconds. The STM was then transported to the reference laboratory for the PCR detection of *C. trachomatis* and *N. gonorrhoeae* infection.

(Note: variation of collection technique was checked in the manufacturer's instructions and appropriate alterations included in instructions)

- A second swab was introduced into the endocervical canal and used to make a smear on a slide for Gram staining for microscopic detection of gonococci and counting of PMNL;
- If cervical or vaginal ulceration was found, the number and characteristics were noted. A swab from a PCR collection kit was used to scrape the base of the ulcer then placed into the collection/transport tube and stored in the refrigerator for transport to CDC and
- Five ml of blood was drawn for syphilis and hepatitis serology.

For Youth

A first catch urine specimen was collected for PCR testing for gonorrhea and chlamydia. The urine specimen were stored in cold packs, handled and transported as indicated in the manufacturer's instructions.

(No physical examination was performed.)

3. Diagnosis and Treatment:

A diagnosis was made, taking into account the results of the interview, risk assessment, physical examination, microscopy results (Gram stain and direct wet mount examination). Treatment was given according to the national STI case management guidelines.

All investigations and treatment drugs were provided free of charge.

The patient was also given STI/HIV education and counseling. It included information regarding risk reduction, promotion of safer sexual behavior and use of condoms. Patients with presumptive diagnosis of cervicitis/urethritis and genital ulcers were counseled on partner notification and referral.

4. Follow-up:

Patients were asked to return after 7 days for a follow-up visit. The diagnosis was reviewed in light of the results of any investigation received and any appropriate change or addition to treatment made.

IV. DATA ANALYSIS:

Completed questionnaires and clinical data forms together with the laboratory specimens were transported to the central laboratory where they were stored in a locked filing cabinet. These completed forms along with completed laboratory results were then sent to the Department of Health for data entry. Data forms were entered twice into the database to minimize transcription errors. The cleaned data set was analyzed using Epi Info 6.0 software.

The study subjects were described according to selected demographic, medical characteristics and sexual practices. Simple proportions were calculated to determine prevalence.

Frequency distributions and percentages were used to describe qualitative variables. Mean, median and variance were estimated for quantitative continuous variables.

The point and interval estimates of the effect measure (i.e., prevalence ratio \cong incidence density ratio) as a measure of the association between a particular potential risk factor and GC/chlamydial infection among women with vaginal discharge were estimated. Tests of hypotheses were also done to determine the statistical significance of these associations. The independent effect of each potential risk factor on gonococcal and chlamydial infections was estimated by doing stratified analysis and computed for the adjusted measure of effect using the Mantel-Haenszel method. Logistic regression was performed to describe the association between the potential risk factors and the infection of interest.

V. RESULTS

FEMALES (General Population):

A total of 2,410 female respondents were recruited during the survey. Their ages ranged from 17 – 49 years (median 34; mean 34; SD 7.46). Ninety one percent (2,187) were married. On average, they first married or lived-in when they were 22 years old (range: 14 – 49). The women in the sample were highly educated, 41% (993) had completed college (four years of tertiary education) and 40% (966) had finished high school (Table 3). There was no significant difference between the socio-demographic characteristics of those infected (NG/CT) and those without infection (Table 3.A).

**Table 3. Socio-demographic Characteristics of Female Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 2,410)**

Characteristics	Frequency	Percent (%)
<i>Civil Status:</i>		
Married	2,187	91
Live-in*	174	7
Single	26	1.1
Separated	14	0.6
Widow	9	0.4
<i>Highest Educational Attainment:</i>		
College	993	41
High School	966	40
Elementary	350	14
Vocational	88	3.7
No formal education	11	0.5

* Live-in refers to living together in the same roof without being married in the church or the civil courts

**Table 3A. Socio-demographic Characteristics of Females (Gen. Pop'n)
According to Presence or Absence of Infection, February to May 2002**

Demographic Characteristics	With NG/CT		Without NG/CT	
<i>Age (Years)</i>	<i>n = 152</i>		<i>n = 2250</i>	
Mean	32.3		34.0	
Median	32.0		34.0	
Standard Deviation	7.4		7.4	
Min – Max (Range)	19 – 49 (30)		17 – 49 (32)	
<i>Civil Status</i>	<i>n = 152</i>		<i>n = 2250</i>	
Married	125	82.2%	2057	91.4%
Live-in	23	15.1%	149	6.6%
Separated	2	1.3%	12	0.5%
Widow	0	0.0	9	0.4%
Single	2	1.3%	24	1.1%
<i>Age Married (Years)</i>	<i>n = 148</i>		<i>n = 2224</i>	
Mean	21.6		22.2	
Median	21.0		22.0	
Standard Deviation	3.8		4.4	
Min – Max (Range)	14 – 35 (21)		14 – 49 (35)	
<i>Level of education</i>	<i>n = 152</i>		<i>n = 2250</i>	
Elementary	21	13.8%	329	14.6%
High School	67	44.1%	896	39.8%
College	56	36.8%	934	41.5%
Vocational	6	4.0%	81	3.6%
No formal form of education	2	1.3%	9	0.4%
No answer	0	0.0	1	0.04%

Table 4 summarizes the prevalence of sexually transmitted infections among female respondents; chlamydial infection was 5.75%, gonorrhea 0.75%, syphilis 0.17%, trichomoniasis 3.18%, candidiasis 17.16%, bacterial vaginosis 28.56% and hepatitis B 3.2%.

**Table 4. Prevalence of STIs among Female Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002**

STI	Laboratory Test	Prevalence	
		Percent	95% Confidence Interval
Chlamydial Infections (n = 2,402)	PCR	5.75	4.85 – 6.75
Gonorrhea (n = 2,402)	PCR	0.75	0.44 – 1.18
Syphilis* (n = 2,410)	RPR/TPPA	0.17	0.04 – 0.4
Trichomoniasis (n = 2,267)	Culture/Wet Mount	3.18	2.49 – 3.98
Candidiasis (n = 2,384)	KOH	17.16	15.66 – 18.73
Bacterial Vaginosis (n = 2,389)	Nugent Criteria	28.56	26.75 – 30.42
Hepatitis B** (n = 2,410)	Rapid Immunochromatography / ELISA	3.2	2.5 – 4.0

*RPR reactive and TPPA positive

**Hepatitis B surface Antigen

(Except for candidiasis, all tests were performed or confirmed by SACCL)

Among women with symptoms of abnormal vaginal discharge or lower abdominal pain, *Chlamydia trachomatis* was prevalent at 6.12%, *Neisseria gonorrhoeae* at 0.85%, *Trichomonas vaginalis* at 3.38%, *Candida albicans* at 17.11% and bacterial vaginosis at 28.16% (Table 5).

Table 5. Prevalence of STIs among Females with Symptoms of Abnormal Vaginal Discharge
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002

STI	Laboratory Test	Prevalence	
		Percent	95% Confidence Interval
Chlamydial Infections (n = 1,537)	PCR	6.12	5.0 – 7.4
Gonorrhea (n = 1,538)	PCR	0.85	0.4 – 1.4
Trichomoniasis (n = 1,451)	Culture/Wet Mount	3.38	2.5 – 4.4
Candidiasis (n = 1,525)	KOH	17.11	15.3 – 19.1
Bacterial Vaginosis (n = 1,520)	Nugent Criteria	28.16	25.9 – 30.5

(Except for candidiasis, all tests were performed or confirmed by SACCL)

[Although 1,538 women were observed to have abnormal vaginal discharge, only those with confirmed results were reflected on this data.]

Thirty-one percent (43) of those positive for chlamydial infection while 28% (5) of those positive for gonorrhea were asymptomatic.

Sexual Behavior:

Respondents had their sexual debut at a median age of 21 years (mean 22; range: 4 – 48). During the past six months, 2.4% (57) had a new partner while 0.9% (21) had multiple partners. They had an average of one sexual partner during the past six months (range: 0 – 4). Of these, 97.71% (2,355) had regular partners, 1.1% (26) had non-regular partners. The majority of the sample were recently sexually active. Eighty-eight percent (2,117) and 0.2% (4) reported to have sex with their regular partners and non-regular partners respectively during

the past 30 days. Condom use was low. Seven percent (156 of 2,117) reported to have ever used a condom while only 4% (100 of 2,117) used a condom during the last time they had sex with their regular partners during the past 30 days. Among those who had non-regular partners none used condom during the past 30 days. Table 6 describes the sexual history and behaviors of female respondents according to the presence or absence of infection.

**Table 6. Sexual History and Behavior of Females (Gen. Pop'n)
According to Presence or Absence of Infection, February to May 2002**

Sexual History & Behavior	With NG/CT	Without NG/CT
<i>Age of first coitus (Years)</i>	<i>n = 151</i>	<i>n = 2236</i>
Mean	21.0	21.6
Median	20.0	21.0
Standard Deviation	3.9	4.4
Min – Max (Range)	14 – 35 (21)	4 – 48 (44)
<i>Had sex in the last 3 months</i>	<i>n = 151</i>	<i>n = 2240</i>
Yes	146 96.7%	2153 96.1%
No	5 3.3%	87 3.9%
<i>Had sex in the last 6 months</i>	<i>n = 151</i>	<i>n = 2239</i>
Yes	150 99.3%	2224 99.3%
No	1 0.7%	15 0.7%
<i>Had new sex partner(s) IN PAST 3 MOS</i>	<i>n = 147</i>	<i>n = 2161</i>
Yes	3 2.0%	37 1.7%
No	144 98.0%	2124 98.3%
<i>Had new sex partner(s) IN PAST 6 MOS</i>	<i>n = 151</i>	<i>n = 2232</i>
Yes	5 3.3%	52 2.3%
No	146 96.7%	2180 97.7%
<i>Had multiple sex partners IN PAST 3 MOS</i>	<i>n = 146</i>	<i>n = 2161</i>
Yes	3 2.0%	9 0.4%
No	143 98.0%	2152 99.6%
<i>Had multiple sex partners IN PAST 6 MOS</i>	<i>n = 148</i>	<i>n = 2211</i>
Yes	3 2.0%	18 0.8%
No	145 98.0%	2193 99.2%

Table 7 describes the proportion of female respondents in the general population, according to the presence or absence of infection, who had sex with partners who had signs of infection in the past three months.

Table 7. Proportion of Females (GP) having sex to Partners with STI Signs According to Presence or Absence of Infection, February to May, 2002

	With NG/CT		Without NG/CT	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<i>Had sex with partner with urethral discharge</i>	<i>n = 145</i>		<i>n = 2124</i>	
Yes	6	4.1%	24	1.1%
No	139	95.9%	2100	98.9%
<i>Had sex with a partner with scrotal swelling</i>	<i>n = 145</i>		<i>n = 2140</i>	
Yes	1	0.7%	10	0.5%
No	144	99.3%	2130	99.5%
<i>Had sex with a partner with genital ulcer</i>	<i>n = 145</i>		<i>n = 2145</i>	
Yes	2	1.4%	14	0.6%
No	143	98.6%	2131	99.4%

Of the female respondents, five (0.2%) revealed to have had exchanged sex for money, 17% (402 of 2,410) reported that they were coerced into unwanted sex in the last three months (Table 8).

**Table 8. Sexual Practices of Females (Gen. Pop'n)
According to Presence or Absence of Infection, February to May, 2002**

	With NG/CT		Without NG/CT	
	No.	%	No.	%
<i>Having ever exchanged sex for money</i>	<i>n = 151</i>		<i>n = 2238</i>	
Yes	1	0.7%	4	0.2%
No	150	99.3%	2234	99.8%
<i>Frequency of having sex in exchanged for money IN PAST 3 mos</i>	<i>n = 1</i>		<i>n = 1</i>	
Mean	0		3	
Median	0		3	
Standard Deviation	.		.	
Min – Max (Range)	.		.	
<i>Coerced to have unwanted sex</i>	<i>n = 151</i>		<i>N = 2233</i>	
Yes	23	15.2%	378	16.9%
No	128	84.8%	1855	83.1%

Three hundred ninety five (16.4%) of the respondents claimed that their husband had been away from home during the past six months. Of these, 90.6% (358 out of 395) had sex with their husband within the week of his return. Only 7% (25 out of 358) ever used a condom during these sexual encounters. The majority of the respondents (59.2%) believed that their partners never had other sexual partners during the past three months.

Obstetrical Status/History:

Rates of pregnancy were high with 96.3% of respondents having had a history of pregnancy. One hundred eighty four (7.7%) were currently pregnant and 29.7% reported an abortion, either spontaneous or induced. However, no question was asked on this issue. Sixty-two percent of respondents were currently using at least one form of contraception. Pills were the most common form of contraception used at 38% (571) followed by injectables (Depo-Provera® -

medroxyprogesterone acetate) at 18% (264). Intra-uterine device (IUD) was common at 13% (193) while bilateral tubal ligation (BTL) was 12% (188) (Table 9).

**Table 9. Contraception Used by Female Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 1,494)**

Form of Contraception Used	Using Method N (%)
Pills	571 (38)
Injectables	264 (18)
Intra-uterine Device (IUD)	193 (13)
Bilateral Tubal Ligation (BTL)	188 (12)
Withdrawal	97 (6)
Condom	92 (6)
Natural Family Planning (NFP)	87 (6)
Others	2 (0.1)
Total	1,494 (99.1)*

*rounding error

Present and Past Clinical Findings:

Among all the respondents, 12% (287) reported to have genital discharge, 4.3% (103) had genital ulcer, 3.2% (77) had lower abdominal pain associated with fever and 2.0% (47) reported a mass on the lower portion of the vaginal opening during the past 12 months. Only one woman was found to have a current genital ulcer on examination. Twenty four percent (587) presented to have symptoms of genital itching, 22% pain during sexual intercourse while 18% presented with

vaginal discharge and 15% with painful urination (Table 10). No sign and symptom was significantly associated with gonococcal or chlamydial infection.

**Table 10. Presenting Symptoms Reported by Female Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 2,410)**

Symptoms	Frequency	Percent
Genital Itching	587	24
Dyspareunia	530	22
Vaginal Discharge	444	18
Dysuria	367	15
Others	104	8
No Symptoms	1,126	47

**Multiple responses allowed*

Correlation of Behavioral and Clinical Data to Infection:

On simple analysis, women who claimed to have vaginal discharge (OR = 1.60; 95% CI 1.08 – 2.38; p = 0.019) or had multiple sexual partners in the past three months (OR = 5.95; 95% CI 1.50 – 20.91; p = 0.010) were more likely to have chlamydial infection.

On the other hand, those who felt pain or burning sensation when urinating (OR = 2.81; 95% CI 1.04 – 7.54; p = 0.040) or having sex with a partner with urethral discharge during the past three months (OR = 16.47; 95% CI 4.50 – 60.20; p = 0.000) were more likely to have gonorrhoea.

Those who reported to have multiple partners in the past three months, had sex with a partner with urethral discharge in the past three months or had the

presence of vaginal discharge were more likely to have an infection (CT/NG) (Table 11).

On multiple logistic regression, only having multiple partners the past three months was significantly associated with infection. They were five times more likely to have an infection (OR = 5; $p = 0.011$; 95% CI 1.47 – 20.64).

**Table 11. Factors Associated with Infection Among Women (GP)
RTI/STI Prevalence in Selected Sites in the Philippines
February to May 2002**

Variable	Odds Ratio		p-value
	Point Estimate	95% CI	
Having multiple partners in the past 3 mos.	5.0	1.34 – 18.73	0.016
Sex with a partner with urethral discharge in the past 3 mos.	3.78	1.52 – 9.39	0.004
Presence of vaginal discharge	1.63	1.12 – 2.37	0.011

MALES (General Population):

A total of 1,204 men were recruited during the survey. Their ages ranged from 18 – 65 years with a median of 35 (mean 36; SD 10.67). Seventy five percent (904) were married. Respondents married or lived-in at a median age of 25 years (mean 25; range: 12 – 48). They were also highly educated with 39.6% (477) having finished college (four years of tertiary education) and 36.7% (442) having completed secondary education (Table 12). There was no significant difference on the socio-demographic characteristics of those who had infection than those without infection (Table 12A).

**Table 12. Socio-demographic Characteristics of Male Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 1,204)**

Characteristics	Frequency	Percent
<i>Civil Status:</i>		
Married	904	75.1
Single	218	18.1
Live-in*	71	5.9
Separated	6	0.5
Widow	5	0.4
<i>Highest Educational Attainment:</i>		
College	477	39.6
High School	442	36.7
Elementary	213	17.7
Vocational	71	5.9
No formal education	1	0.1

* Live-in refers to living together in the same roof without being married in the church or the civil courts

**Table 12A. Socio-demographic Characteristics of Males (Gen. Pop'n)
According to Presence or Absence of Infection, February to May 2002**

Demographic Characteristics	With NG/CT	Without NG/CT
<i>Age (Years)</i>	<i>n = 61</i>	<i>n = 1135</i>
Mean	28.7	35.9
Median	27	35
Standard Deviation	8.1	10.6
Min – Max (Range)	18 – 50 (32)	18 – 65 (47)
<i>Civil Status</i>	<i>n = 61</i>	<i>n = 1136</i>
Married	33 54.1%	869 76.5%
Live-in	6 9.8%	65 5.7%
Separated	1 1.6%	5 0.4%
Widow	0 0.0%	4 0.4%
Single	21 34.4%	193 17%
<i>Age married (Years)</i>	<i>n = 40</i>	<i>n = 942</i>
Mean	24.1	25.1
Median	23	25
Standard Deviation	4.4	4.9
Min – Max (Range)	14 – 35 (21)	12 – 48 (36)
<i>Level of education</i>	<i>N = 61</i>	<i>n = 1136</i>
Elementary	6 9.8%	207 18.2%
High School	27 44.3%	410 36.1%
College	19 31.1%	456 40.1%
Vocational	9 14.8%	62 5.5%
No formal Form of Education	0 0.0%	1 0.1%

Table 13 provides a detail of the prevalence of sexually transmitted infections among all male respondents: chlamydial infection 4.4 %, gonorrhea 1.1%, syphilis 0.2% and hepatitis B 9.6%.

**Table 13. Prevalence of STIs among Male Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 1,204)**

STI	Laboratory Test	Prevalence	
		Percent	95% Confidence Interval
Chlamydial infections	PCR	4.4	3.4 – 5.8
Gonorrhea	PCR	1.1	0.6 – 1.9
Syphilis	RPR – TPPA	0.2	0.1 – 0.8
HbsAg	Rapid Immunochromatography / ELISA	9.6	8.0 – 11.4

Of the nine respondents who had abnormal urethral discharge, three tested positive for chlamydia and seven for gonorrhea. About 88% of men with chlamydial and gonococcal infections were asymptomatic.

Sexual Behavior:

Men reported to have their first sexual intercourse at a median age of 19 years (mean 20; range: 8 - 42). During the past six months, 6.8% (82) had a new partner and 10.9% (131) had multiple partners. The majority had one sexual partner during this 6-month period (range 0 – 15). Among the respondents, 92.7% (1,116) had regular partners, 10.0% (121) had non-regular partners, 6.3% (76) had bought sex and 7.5% (90) had sold sex. Table 14 shows the number and type of sexual partners of male respondents during the past six months based on the presence or absence of infection.

Table 14. Number and Type of Partners Among Males (Gen. Pop'n) According to Presence or Absence of Infection, February to May 2002

Sex Partners in Past 6 Months	With NG/CT	Without NG/CT
<i>Total Number of REGULAR Sex Partners^a</i>	<i>n = 61</i>	<i>n = 1101</i>
Mean	0.9	1.0
Median	1	1
Standard Deviation	0.4	0.5
Min – Max (Range)	0 – 2 (2)	0 – 12 (12)
<i>Total Number of NONREGULAR Sex Partners^b</i>	<i>n = 60</i>	<i>n = 1095</i>
Mean	0.7	0.1
Median	0	0
Standard Deviation	1.5	0.5
Min – Max (Range)	0 – 10 (10)	0 – 9 (9)
<i>Total Number of COMMERCIAL Sex Partners^c</i>	<i>n = 15</i>	<i>n = 61</i>
Mean	0.5	0.1
Median	0	0
Standard Deviation	1.2	0.5
Min – Max (Range)	0 – 6 (6)	0 – 7 (7)

^aREGULAR Sex Partners – include spouse/live-in or one whom subject had regular coitus for ≥ 3 months

^bNONREGULAR Sex Partners – include those whom subject had 'one-night stand' sex

^cCOMMERCIAL Sex Partners – include those wherein money/any material is/are involved in exchange of sex.

Thirty-four (2.8%) of respondents had anal intercourse. Of these, almost a third (10) had receptive anal intercourse with a male. Among those with male partners, only one had sex with a partner with urethral discharge. Among the 1,149 respondents reporting female sexual partners, only 1.2% (13) reported sex with a partner with vaginal discharge.

Eighty percent (964) of the men in the sample reported having sexual intercourse with their regular partners during the past 30 days, 4.8% (58) with a non-regular partner and 2.2% (27) with a commercial sex worker. Condom use was low. Only 8.6% (83 out of 964) had ever used a condom with a regular partner. Among the 27 men reporting sex with commercial sex partners, only 6

used a condom. However, condom use with a non-regular partner was even lower, only 5 out of 58 (8.6%). Table 14A gives information on the condom use, 30 days prior to interview, of male respondents by type of partner and based on the presence or absence of infection.

Table 14A. Condom Use (Ever) by Type of Partner Among Males in the Past 30 Days (Gen. Pop'n) According to Presence or Absence of Infection, February to May 2002

Type of Partner	With NG/CT	Without NG/CT
<i>With REGULAR Sex Partner(s)</i> Yes No	<i>n = 45</i> 2 4.4% 43 95.6%	<i>n = 948</i> 81 8.5% 867 91.5%
<i>With NONREGULAR Sex Partner(s)</i> Yes No	<i>n = 11</i> 0 0.0 11 100.0%	<i>n = 43</i> 5 11.6% 38 88.4%
<i>With COMMERCIAL Sex Partner(s)</i> Yes No	<i>n = 6</i> 0 0.0 6 100.0%	<i>N = 20</i> 6 30.0% 14 70.0%

Present and Past Clinical Findings:

Among the respondents, 2.6% (31) of the men reported urethral discharge, 1.2% (14) reported a genital ulcer and 1.2% (14) reported scrotal swelling in the past 12 months. Thirty-three (2.7%) had been diagnosed with at least one sexually transmitted infection in the past three years. Of these, 18 had been diagnosed with gonorrhoea.

Eight percent (96) of respondents reported having a painful or a burning sensation when urinating, 3.7% (44) reported genital itching, 1.8% (22) reported urethral discharge and 1.7% (20) reported a scrotal swelling.

On physical examination, 0.9% (11) had visible urethral discharge, 0.8% (10) had discharge after milking and 0.7% (9) respondents had a scrotal swelling.

Correlation of Behavioral and Clinical Data to Infection:

On simple analysis, those who had a new partner in the past three months (OR = 5.4; p = 0.033; 95% CI 1.14 – 25.55) or multiple partners in the past three months (OR = 25.4; p = 0.000; 95% CI 7.49 – 86.43) were more likely to have gonorrhoea. Table 15 shows the factors associated with chlamydial infections.

On multiple logistic regression, those with urethral discharge were more likely to have an infection (OR = 338; p = 0; 95% CI 35 – 3246).

**Table 15. Factors Associated with Chlamydial Infection Among Men
RTI/STI Prevalence in Selected Sites in the Philippines
February to May 2002**

Variable	Odds Ratio		p-value
	Point Estimate	95% CI	
Having multiple partners in the past 3 mos.	3.2	1.55 – 6.73	0.002
Having new partners in the past 3 mos.	4.1	1.63 – 10.28	0.003
Presence of urethral discharge	6.9	2.44 – 19.48	0.000

YOUTH

The youth referred to in this study are young women aged 15 – 24 years and young men aged 18 – 24 years.

FEMALE (n = 300)

Three hundred young females were recruited during the survey. Their ages ranged from 16 – 25 years (median/mean 22). Fifty-two percent (156) were married. On the average, they first married or lived-in when they were 19 years old (median 20; range: 14 – 24). Ninety percent (270) had completed at least secondary education (Table 16). There was no significant difference on the socio-demographic characteristics of those who were infected and those without infection (Table 16A).

**Table 16. Socio-demographic Characteristics of Female Youths
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 300)**

Characteristics	Frequency	Percent
<i>Civil Status:</i>		
Married	156	52.0
Single	103	34.3
Live-in*	38	12.7
Separated	2	0.7
Widow	1	0.3
<i>Highest Educational Attainment:</i>		
High School	138	46
College	132	44
Elementary	24	8
Vocational	6	2

* Live-in refers to living together in the same roof without being married in the church or the civil courts

Table 16A. Socio-demographic Characteristics of Female Youths According to Presence or Absence of Infection, February to May 2002

Demographic Characteristics	<i>With NG/CT</i> <i>n = 23</i>		<i>Without NG/CT</i> <i>N = 275</i>	
<i>Age (Years)</i>				
Mean	21.9		21.7	
Median	22.0		22.0	
Standard Deviation	2.1		2.0	
Min – Max (Range)	17 – 24 (7)		16 – 24 (8)	
<i>Civil Status</i>				
Married	11	47.8%	143	52.0%
Live-in	5	21.7%	33	12.0%
Separated	0	0	2	0.7%
Widow	0	0	1	0.4%
Single	7	30.4%	96	34.9%
<i>Age Married (Years)</i>				
Mean	<i>n = 16</i>		<i>n = 179</i>	
Median	19.1		19.5	
Standard Deviation	18.0		20.0	
Min – Max (Range)	2.1		2.1	
	16 – 23 (7)		14 – 24 (10)	
<i>Level of education</i>				
Elementary	3	13.0%	21	7.6%
High School	11	47.8%	126	45.8%
College	9	39.1%	122	44.4%
Vocational	0	0	6	2.2%

Using polymerase chain reaction, the overall prevalence of gonorrhea among female youth respondents was 0.7% (2) [95% CI 0.1 – 2.4] while chlamydial infection was 7.7% (23) [95% CI 4.9 – 11.3].

Sexual Behavior:

Female youth respondents had their sexual debut at a median age of 19 years (mean 19; range: 13 – 24). Eighty-three percent had partners who were older than themselves. The median age of their partners was 22 years [mean 23]. Only 7% (22) used a condom the first time they had sex.

In the last 30 days, 70% (210) had sex with their regular partners. Only 6.2% had ever used a condom during that time.

Seventy-seven percent (230) had sex in the last three months. Of these, 1% (3) had a new partner and 0.7% (2) had multiple partners.

During the past six months, 88% (264) had a regular partner and 2.7% (8) had a non-regular partner. During this period, 90% (271) had sexual intercourse. Three percent (9) of the respondents had a new partner and 1.7% (5) had multiple partners.

Twenty-four percent (73) reported that their regular partner had been away from home during the past six months. Seventy-nine percent (58 out of 73) claimed to have sex with their regular partners within the week of their partners' return. Only 1.3% (4) used a condom.

Knowledge, Opinions and Attitudes:

Although 99% (297) had ever heard of HIV or the disease called AIDS, there were still a considerable number of the respondents who had incorrect knowledge about HIV (Table 17).

Table 17. Proportion of Female Youths with Incorrect Knowledge About HIV RTI/STI Prevalence Survey in Selected Sites in the Philippines February to May 2002 (n = 300)

Incorrect Knowledge About HIV	Percent
Believed that HIV can be transmitted by mosquito bites	32
Did not know that one can be protected from HIV by using Condom correctly during sex	28.7
Did not know that one can be protected from HIV by having one uninfected faithful partner	24.7
Did not know that one can be protected from HIV by abstaining from sexual intercourse	24.7
Believed that one can get HIV by sharing a meal with an infected person	16

Sixty seven percent (201) had been pregnant. Fourteen percent (43) were currently pregnant and 6.6% (20) gave a history of abortion. Twenty-four percent (72) were currently using at least one form of contraception. Pills and injectables (Depo-Provera® - medroxyprogesterone acetate) were the most common forms of contraception used by the young women (Table 18).

Table 18. Contraception Used by Female Youth Respondents RTI/STI Prevalence Survey in Selected Sites in the Philippines February to May 2002 (n = 72)

Contraception Used*	Using Method N (%)
Pills	36 (50)
Injectables	16 (22.22)
Condom	11 (15.28)
Withdrawal	8 (11.11)
Others	3 (4.17)

*More than one type of contraception can be used

Present and Past Clinical Findings:

Three percent (10) had lower abdominal pain associated with fever and 1.3% (4) had vaginal discharge during the past 12 months. Table 19 shows the symptoms presented by respondents.

**Table 19. Symptoms Presented by Female Youth Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 300)**

Symptoms	Frequency	Percent
Dyspareunia	27	9
Dysuria	21	7
Genital itching	14	4.7
Lower abdominal pain associated with fever	12	4
Vaginal Discharge	6	2
Vulval Mass	3	1
Without symptoms	273	91

**Multiple responses allowed*

YOUTH**MALE (n=300):**

Three hundred male youth respondents were also recruited during the survey. Their ages ranged from 15 – 25 years (median/mean 21). Seventy percent were single. They were also highly educated, 46% (138) had completed secondary education and 41.7% (125) finished college (four years of tertiary education) (Table 20). There was also no significant difference on the socio-demographic characteristics of young males who had the infection than those without (Table 20A).

**Table 20. Socio-demographic Characteristics of Male Youth Respondents
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 300)**

Characteristics	Frequency	Percent
<i>Civil Status:</i>		
Single	210	70
Married	63	21
Live-in*	27	9
<i>Highest Educational Attainment:</i>		
High School	138	46
College	125	42
Elementary	30	10
Vocational	7	3

* Live-in refers to living together in the same roof without being married in the church or the civil courts

Table 20A. Socio-demographic Characteristics of Male Youth According to Presence or Absence of Infection, February to May 2002

Demographic Characteristics	With NG/CT <i>n</i> = 28		Without NG/CT <i>n</i> = 270	
<i>Age (Years)</i>				
Mean	20.5		21.2	
Median	21		21	
Standard Deviation	2.6		2.0	
Min – Max (Range)	15-24 (9)		15-24 (9)	
<i>Civil Status</i>				
Married	5	17.9	56	20.7
Live-in	2	7.1	25	9.3
Single	21	75	189	70
<i>Age married (Years)</i>				
Mean	<i>n</i> = 6 20.7		<i>n</i> = 81 20.1	
Median	20.5		20	
Standard Deviation	2.2		1.8	
Min – Max (Range)	18 – 23 (5)		15 – 24 (9)	
<i>Level of education</i>				
Elementary	4	14.3	25	9.3
High School	16	57.1	121	44.8
College	7	25.0	118	43.7
Vocational	1	3.6	6	2.2

The prevalence of gonorrhoea among the male youth population was 1.7% (5) [95% CI 0.5 – 3.8] while chlamydial infection was prevalent at 9% (27) [95% CI 6.0 – 12.8].

Sexual Behavior:

Respondents reported that they had their first sexual intercourse at a median age of 18 years (mean 18; range 8 – 23). Most (58%) had partners younger than themselves. The median age of their partners was 18 years. Only 12% (35) used a condom the first time they had sex.

In the last 30 days, 60% (179) of respondents had sex with their regular partners, 20% (61) with a non-regular partner and 7% (22) with a commercial sex partner. Condom use was also low among young males. Sixteen percent (29 of 179) used a condom with a regular partner, 18% (11 of 61) with a non-regular partner and 23% (5 of 22) with a commercial sex partner.

Seventy six percent (227) had sex during the past three months. Of these, 9% (26) had a new partner and 16% (48) had multiple partners.

They had a median of one sexual partner during the past six months (mean 2; range 0 – 50). Seventeen percent (51) had a new partner and 32% (95) had multiple partners. During this period, 60% (181) had regular partners, 31% (93) had non-regular partners and 8% (25) had commercial sex partners. Sixteen percent (49) had exchanged sex for money. Eleven percent (34) of the male youth respondents had engaged in anal intercourse, 35% (12 of 34) had receptive anal intercourse with a fellow male. Only one claimed to having had a partner with urethral discharge. Among those reporting with a female partner, only one reportedly had a partner with vaginal discharge.

Knowledge, Opinions and Attitudes:

Ninety eight percent (294) had ever heard of HIV or the disease called AIDS. However, there were still a large proportion of the respondents who had incorrect knowledge about HIV Table 21.

Table 21. Proportion of Male Youth with Incorrect Knowledge About HIV RTI/STI Prevalence Survey in Selected Sites in the Philippines February to May 2002 (n = 300)

Incorrect Knowledge About HIV	Percent
Believed that HIV can be transmitted by mosquito bites	31
Did not know that one can be protected from HIV by using condom correctly during sex	27
Did not know that one can be protected from HIV by having one uninfected faithful partner	26.7
Did not know that one can be protected from HIV by abstaining from sexual intercourse	26.3
Believed that one can get HIV by sharing a meal with an infected person	21

Past and Present Clinical History:

Two percent (6) of respondents reported to have had genital ulcer in the past 12 months while 1.3% (4) reported urethral discharge. Seven (2.3%) had been diagnosed with at least one STI in the past three years.

Eight percent (24) of respondents presented having painful or burning sensation when urinating while 3% (9) presented having genital itching, 2.3% (7) presented having urethral discharge and one (0.3%) presented having scrotal swelling.

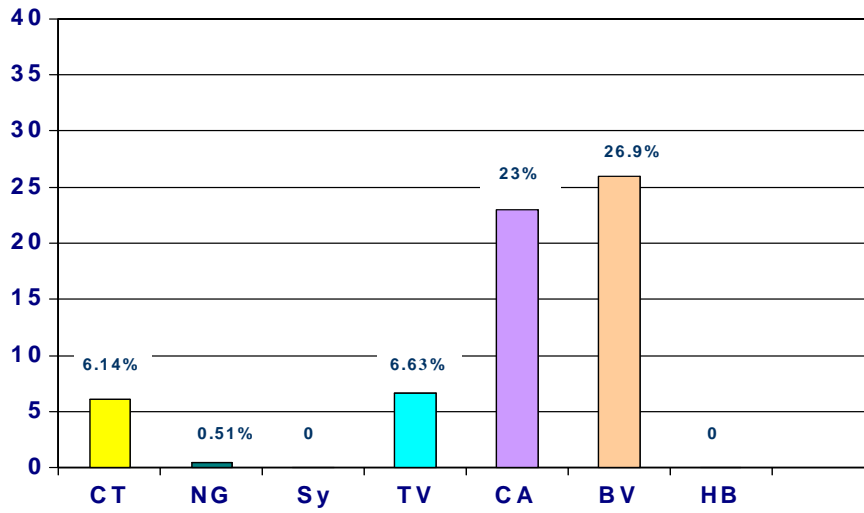
Table 22 gives a summary of the prevalence of STI among the different sample populations. Figure 1 - 12 shows the prevalence of infection by province while Figure 13 presents the prevalence of infection among the youth.

**Table 22. Prevalence of STIs Among the Different Groups
RTI/STI Prevalence Survey in Selected Sites in the Philippines
February to May 2002 (n = 300)**

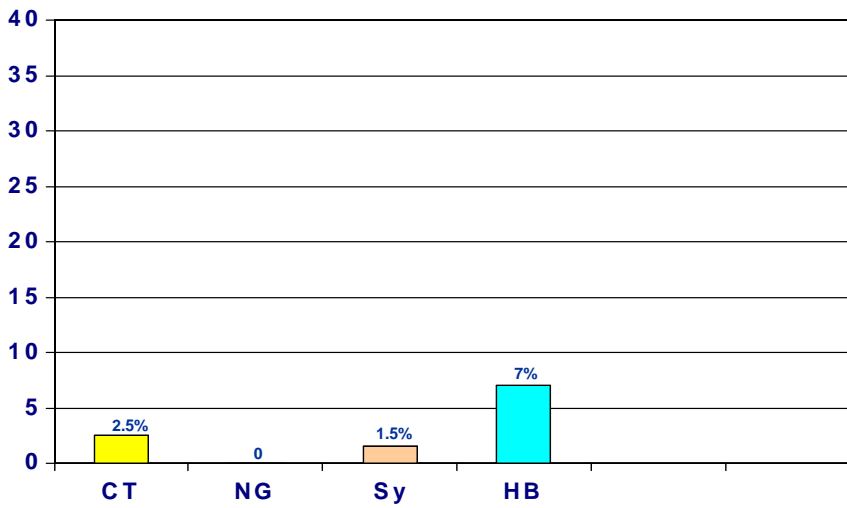
STI	Female (Gen. Pop'n)	Male (Gen. Pop'n)	Female (Youth)	Male (Youth)
Chlamydial infection	5.75	4.4	7.7	9
Gonorrhea	0.75	1.1	0.7	1.7
Syphilis	0.17	0.2	N/D	N/A
Hepatitis B	3.2	9.6	N/D	N/A
Trichomoniasis	3.18	N/A	N/D	N/A
Bacterial Vaginosis	28.56	N/A	N/D	N/A
Candidiasis	17.16	N/A	N/D	N/A

N/A Not Applicable
N/D No Data

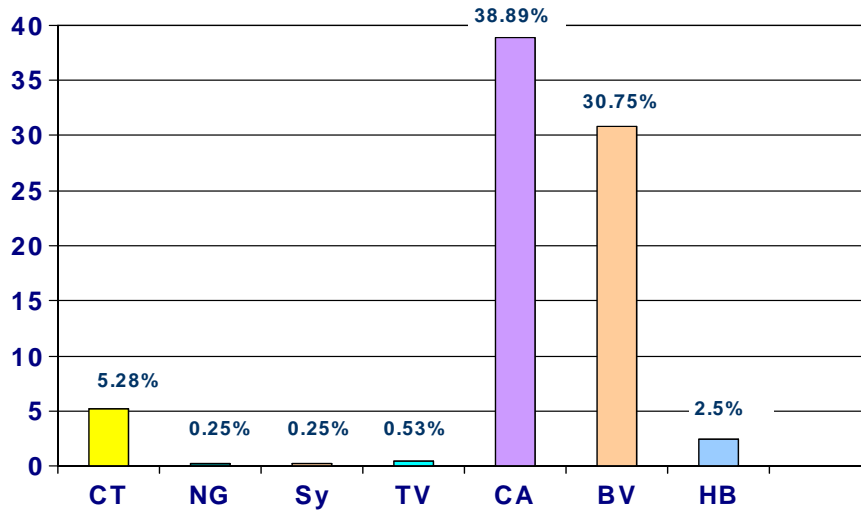
**Fig 1 RTI/STI Prevalence Among Females (GP)
Aklan, January to June 2002**



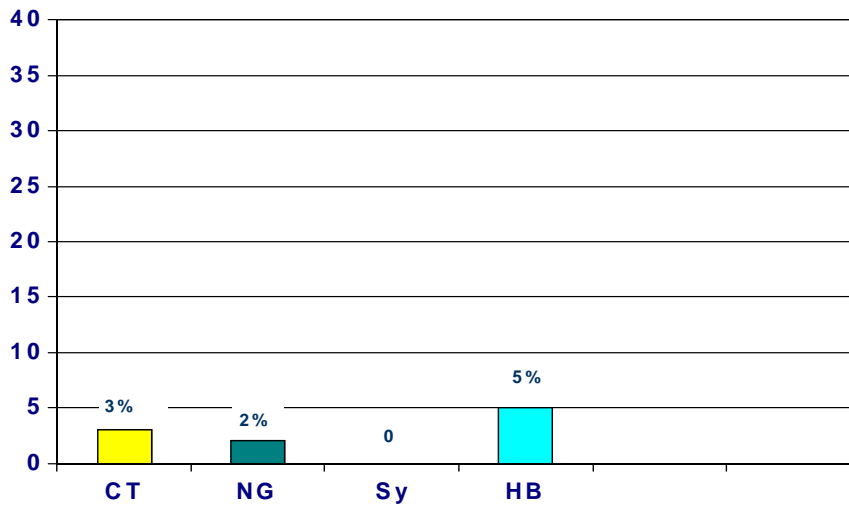
**Fig 2 RTI/STI Prevalence Among Males (GP)
Aklan, January to June 2002**



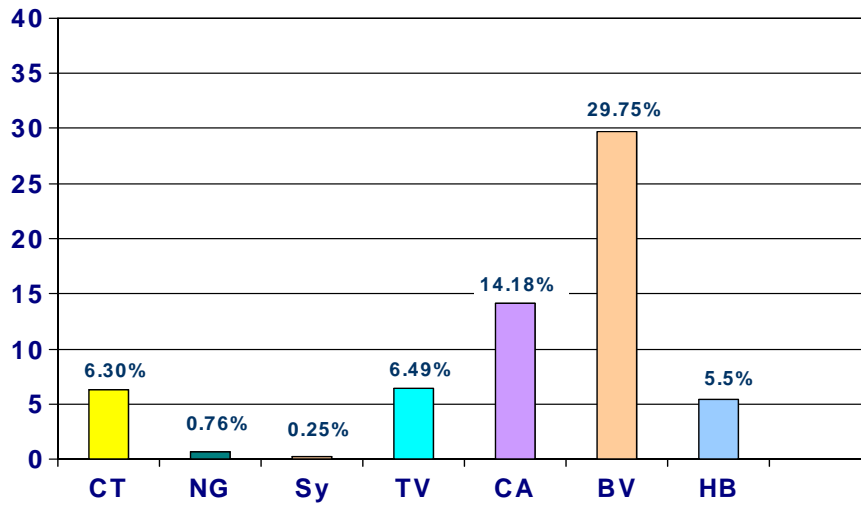
**Fig 3 RTI/STI Prevalence Among Females (GP)
Bohol, January to June 2002**



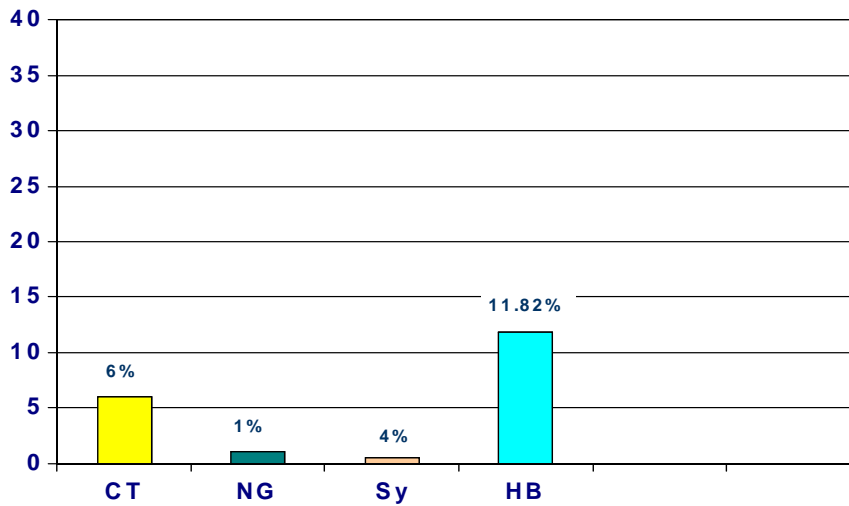
**Fig 4 RTI/STI Prevalence Among Males (GP)
Bohol, January to June 2002**



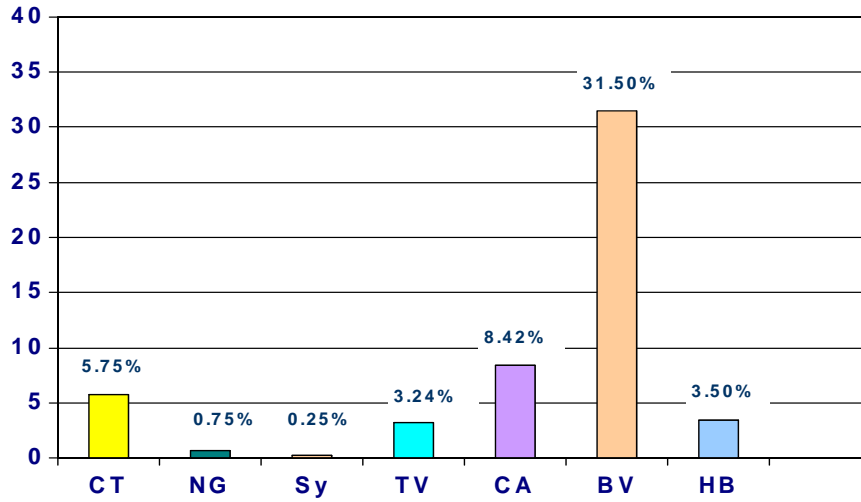
**Fig 5 RTI/STI Prevalence Among Females (GP)
Palawan, January to June 2002**



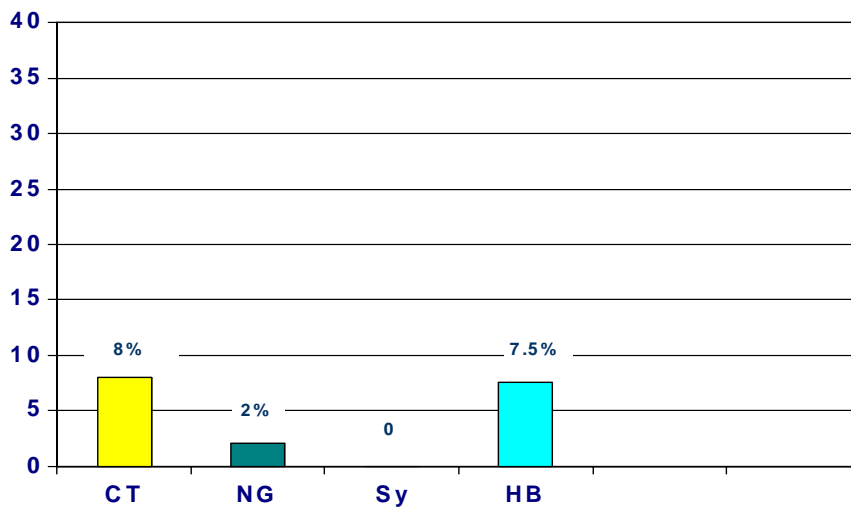
**Fig 6 RTI/STI Prevalence Among Males (GP)
Palawan, January to June 2002**



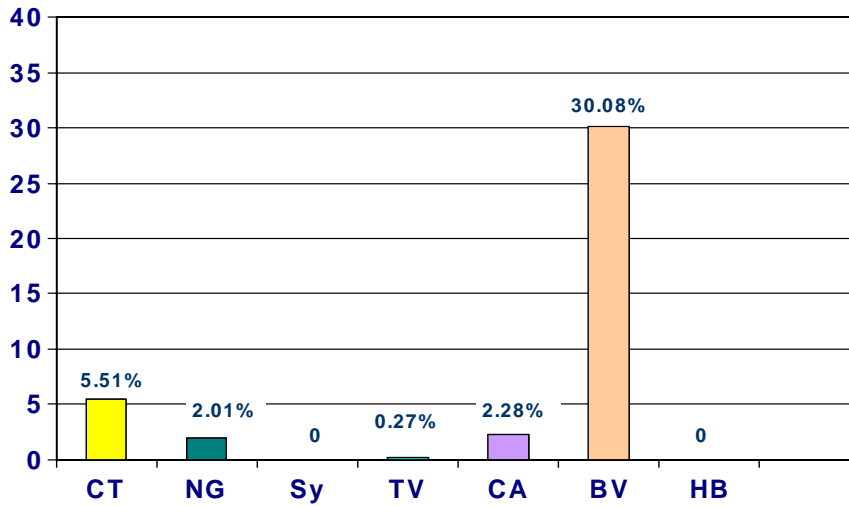
**Fig 7 RTI/STI Prevalence Among Females (GP)
Pangasinan, January to June 2002**



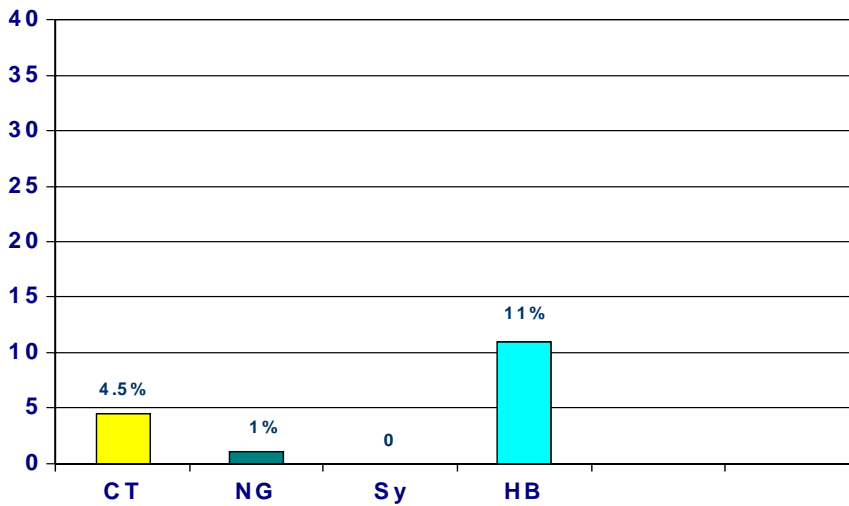
**Fig 8 RTI/STI Prevalence Among Males (GP)
Pangasinan, January to June 2002**



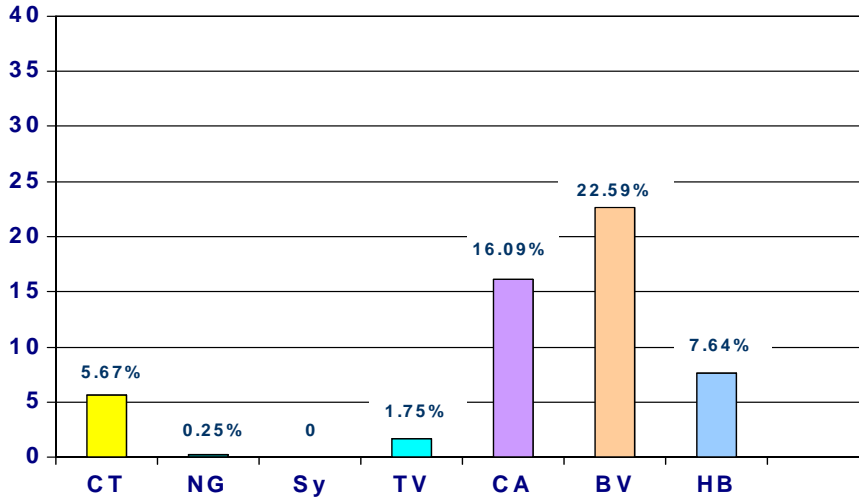
**Fig 9 RTI/STI Prevalence Among Females (GP)
Surigao del Norte, January to June 2002**



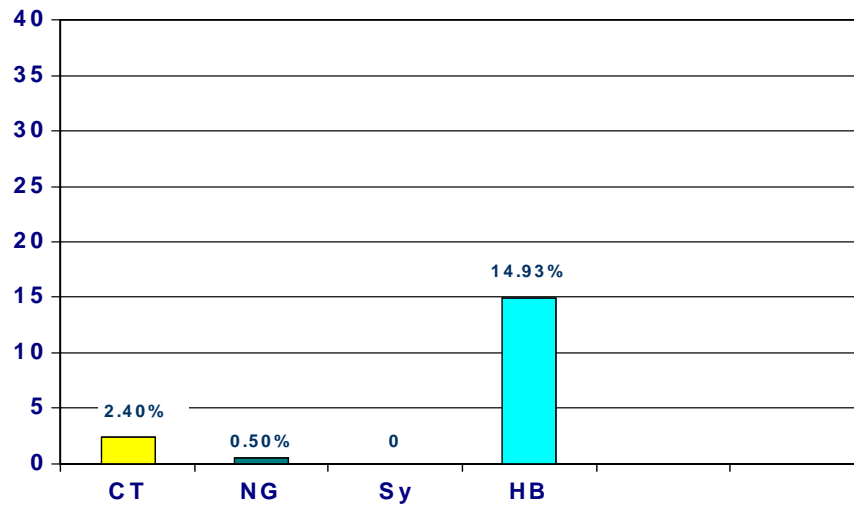
**Fig 10 RTI/STI Prevalence Among Males (GP)
Surigao del Norte, January to June 2002**



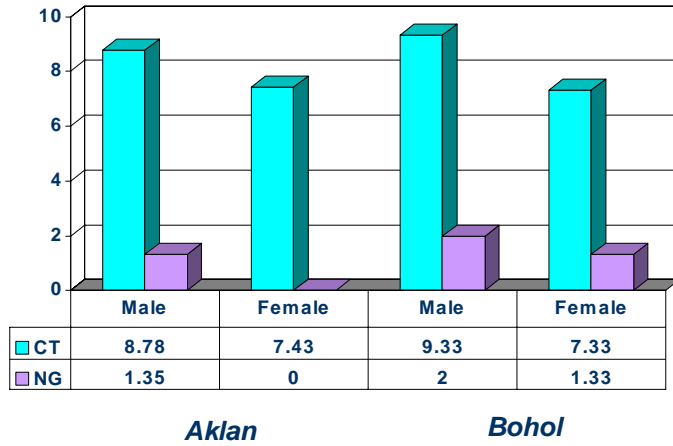
**Fig 11 RTI/STI Prevalence Among Females (GP)
Zamboanga del Norte, *January to June 2002***



**Fig 12 RTI/STI Prevalence Among Males (GP)
Zamboanga del Norte, *January to June 2002***



**Fig 13 RTI/STI Prevalence Among Youth
January to June 2002**



VI. DISCUSSION:

The survey results showed that the STI prevalence in the Philippines is low compared to other studies done both locally and in other developing countries (Table 23).

Table 23. Prevalence of STIs in Other Developing Countries (%)

STI	Apia, Samoa ⁴ ANC Attendees n = 427	Port Vila, Vanuatu ⁵ ANC Attendees n = 545	Matlab, Bangladesh ⁶ Women with vaginal discharge, MCH clinics n=320
Chlamydia	29.	21.5	0.6
Gonorrhea	20.8	5.9	0.3
Trichomoniasis	3.3	27.5	1.9
Syphilis	0.4	2.4	0.9

One local study done showed that the prevalence of chlamydial infections among antenatal clinic women were 11.7%, 9.3% and 7.5% in Bagiuo, Cebu and Davao respectively. Gonorrhea was 0.3% prevalent. Trichomoniasis was 1%, 2.3% and 4% prevalent in Bagiuo, Cebu and Davao respectively⁷. These results were slightly higher compared to studies done in developed countries among the general population.

However, it must be remembered that the sites selected for the survey are Women's Health and Safe Motherhood Project's (WHSMP) RTI sites. This probably means that campaigns against reproductive tract infections in these

⁴ WHO. STI/HIV Antenatal Clinic Survey, Apia, Samoa. WHO/WPRO, 2000.

⁵ WHO. STI/HIV Antenatal Clinic Survey, Port Vila, Vanuatu. WHO/WPRO, 2000.

⁶ Hawkes S, Morison L, Foster S *et al.* Reproductive-tract infections in women in low-income, low prevalence situations: assessment of syndromic management in Matlab, Bangladesh. *Lancet* 1999; 354: 1776–81.

⁷ de los Reyes MR. Prevalence of sexually transmitted infections among selected groups in the Philippines, pp14

areas are given more importance. Health care providers are trained on STI syndromic case management, drugs are in abundance and IEC materials are likewise intensified. Provision of effective curative and preventive services will give significant impact on community STI prevalence. Prompt and effective treatment of STIs is considered an essential component of both STI and HIV control. In individuals, early and effective treatment of STIs prevents their complication. At the population level, it prevents further transmission of STIs and reduces HIV transmission⁸. Credit must also be given to the WHSMP project which probably contributed to lower STI rates.

Sexual risk behavior is a cornerstone in determining who will be more likely to become infected. This study revealed that most respondents do not engage in risky sexual behaviors. Only a few of the respondents had new and/or multiple partners who were of higher risks for STI. However, equally important may be the prior behavior of the partners, as well as the partners of the partners⁹. There were a number of our respondents who had sexual encounters with sex workers.

The civil status of respondents could have also contributed to the low prevalence of infection. More than 75% of respondents were married. Women were recruited from the antenatal, OB/GYN and family planning sections of the out patient department, women coming to these clinics were in more stable relationships, and were therefore less likely to have multiple partners. This would reduce a woman's likelihood of coming into contact with a new infected partner. Additionally, women who were pregnant may have taken a greater interest in their health and the health of their baby. And since they were pregnant, they might have been less sexually active than non-pregnant women¹⁰. In the case of men, most were also in a stable relationship with more than 90% having a

⁸ Dallabeta GA, Gerbase AC, Holmes KK. Problems, solutions and challenges in syndromic management of STD, *The Journal of Sexual Health and HIV*, June 1998 vol 74 suppl 1.

⁹ Gaydos et al. The challenge of sexually transmitted diseases for the military: What Has Changed?. *Clin Infect Dis* 2000;-30;-719-22

¹⁰ Niccolai LM, et al. Incidence and predictors of reinfection with *Trichomonas vaginalis* in HIV-infected women. *Sex Trans Dis*. May 2000,-27,-287

regular partner with low frequency of high-risk behaviors. These findings are compatible with the FHI supported study, "Male Sexual Risk Behavior and HIV/AIDS: A Survey in Three Philippine Cities"¹¹.

The results of the study suggest that young people currently do not seek reproductive health care from government facilities. The average age of respondents in the adult section was high (mean 34 years). Many studies have confirmed that young age and having multiple sexual partners are significant predictors of chlamydial infections. The prevalence of gonorrhea and chlamydial infections among this youth sample was higher than the general population. It is estimated that in developing countries, one in 20 youth contracts an STI each year and one third of all STIs occur among those aged 13 – 20 years¹². This study showed that young people are at risk of serious complications of infections. Most were sexually active though only a few were married, practicing high-risk behaviors, most especially among males. A considerable number had multiple partners, had sex with commercial partners, sold sex and demonstrated low condom use. These kinds of high-risk behaviors can facilitate the spread of infection.

In most developing countries, sex workers and their clients are described as members of 'core groups' and 'bridging groups' respectively that have a disproportionate role in the transmission of STIs in the community. We have demonstrated that young people in particular need to be targeted for prevention efforts given their relatively high rates of chlamydia and their involvement in commercial sex as both customers and also as sex workers.

The proportion of young men and women with misconceptions regarding knowledge on HIV/AIDS was high and should not be neglected. These

¹¹ Ramos-Jimenes, P. & Lee, R. A Survey of Filipino males in three Philippine cities, Behavioral Sciences Dept., De La Salle University/Family Health International. 2001

misconceptions can lead to reduced understanding of real risks of certain behaviors that facilitate transmission of STIs, including HIV. It is therefore important to reach the youth with correct messages on STIs' transmission, prevention and care and encouraging them early and appropriate treatment.

Targeting STI interventions to population groups with the greatest risk of acquiring and transmitting STI had been effective in reducing prevalence of infection. Interventions focusing on core groups (e.g., commercial sex workers, their clients and the youth) are potentially more cost-effective in reducing community prevalence of STI than general population efforts¹³.

Bacterial vaginosis, though strictly not an STI but is related to sexual behavior, is also linked to increased risk of HIV infection.^{14, 15} The vagina is normally colonized by *Lactobacillus* species. Lactobacilli produce lactic acid, which maintains a low vaginal pH and inhibits the growth of many microorganisms, including those associated with BV. Additionally, some lactobacilli – particularly those that “protect” against development of BV – produce hydrogen peroxide, which is toxic to a number of microorganisms, including HIV. Bacterial vaginosis is characterized by a decrease in the hydrogen peroxide-producing lactobacilli and an elevated pH. A low vaginal pH may inhibit CD4 lymphocyte activation and therefore decrease HIV target cells in the vagina; conversely, an elevated pH may make the vagina more conducive to HIV survival and adherence¹⁶. In this study, more than a quarter of female respondents were diagnosed to have bacterial vaginosis.

¹²Brabin L. STI Control for HIV prevention among adolescents. In: UNAIDS/WHO, Consultation on STD Interventions for Preventing HIV: What is the evidence? UNAIDS/00.06E_WHO/HS1/2000.02.Geneva: 2000.-33-37

¹³ Van Dam, C., STD Prevention: Effectively Reaching the Core and a Bridge Population With a Four-Component Intervention, Sexually Transmitted Diseases, Vol 27(1), January 2000.9-11

¹⁴ Taha TE, Hoover DR, Dallabetta GA et al. Bacterial vaginosis and disturbances of vaginal flora: association with increased acquisition of HIV. *AIDS* 1998;12:1699-706.

¹⁵ Sewankambo N, Gray RH, Wawer MJ et al. HIV-1 infection associated with abnormal vaginal flora morphology and bacterial vaginosis. *Lancet* 1997;350:546-50.

¹⁶ Hill JA, Anderson DJ, Human vaginal leukocytes and the effects of vaginal fluid on lymphocytes and macrophage defense function, *Am J Obstet Gynecol* 1992; 166; 720-6

Chlamydial infection can produce serious consequences, but it is not as well publicized in the Philippines as other STIs, such as gonorrhea or syphilis. Up to 70 percent of women who are infected don't know they have the infection because they lack signs or symptoms. The same is true for up to 30 percent of affected men. Without signs or symptoms, people aren't aware that they have a problem until they develop complications. Among women, these include: pelvic inflammatory disease (PID), ectopic pregnancy, infertility, and dangerous complications during pregnancy and birth. One of the complications for men is inflammation of the testicles. In this study chlamydial infection was five percent prevalent on both sexes.

This study revealed only a 0.3% and 0.2 % prevalence of syphilis among female and male respondents respectively demonstrating that ulcerative infections are not common in the Philippines. This is supported by the fact that only one female respondent and no males were found to have a genital ulcer on physical examination. The etiology of her ulcer was not determined on laboratory examination.

Other findings of interest include the reporting of early sexual debut and the rates of hepatitis B. Several respondents, both women and men had very young ages for first experiencing sexual intercourse, four years and 8 years respectively. Early sexual intercourse can cause physical and emotional trauma and increase later chances of infection. Although not documented, these respondents revealed that they were victims of sexual abuse. The high rate of hepatitis B infection among males demonstrated that there is also a large pool of hepatitis B carriers among our general male population. Since three fourths of the male respondents were married, they pose a significant risk to their wives and offspring through sexual and vertical transmission respectively.

Although rates of infections are low, complacency should be avoided because of the potential threat of these infections to spread. The high proportion of asymptomatic women and the high frequency of symptoms reported by the respondents are concrete indicators that infections are likely to spread if not properly attended. Collective efforts of the society to protect, promote and restore community's health are imperative to avert the spread of infection. STIs are well-established co-factors for HIV. Therefore, early detection and treatment of STIs, is also an effective strategy for the prevention of sexually transmitted HIV.

VII. CONCLUSION

In conclusion, this study revealed that STI prevalence, particularly genital ulcer disease, remains low in the general population. Most STIs were shown to be asymptomatic and risk was increased among those with established risk factors (e.g., multiple partners, sex with a male with urethral discharge). The study also demonstrated moderately high prevalence of established risk behaviors such as men having unprotected commercial sex encounters, men selling sex and, importantly, very low condom use among men and women.

However, young people have relatively high prevalence of genital chlamydial infection and this is a cause for concern. Specific interventions targeting young people would appear to be warranted and also to be expected to have a significant impact on the potential spread of HIV among this group. This is particularly likely given that significant numbers of men were shown to be both buying and selling sex in the study. The study also suggested that younger, single women usually have poor access to acceptable reproductive health services while older, married women in the reproductive age group usually seek care in government health facilities.

VIII. RECOMMENDATIONS

The findings of the study revealed that high rates of STI especially chlamydial infections among the youth should be addressed. It was noted that a higher proportion of younger men are engage in behaviors that put them at increased risk for STI such as having multiple partner, commercial sex partners and selling sex with low condom use. The youth also tend to have earlier sexual debut compared to older men and women in the study. The awareness on HIV/AIDS is high however considerable misconceptions among the youth have been noted in the study. The access to care is limited because of their reluctance to seek care in regular health centers and hospital OPDs. The following are recommended for the youth:

- Increase awareness among the youth about STI/HIV/AIDS risk, STI symptoms and broader reproductive health issues through IEC campaigns and peer education.
- Prioritize the provision of behavior change interventions targeted among the youth.
- Establish and strengthen innovative youth friendly reproductive health services, including RTI/STI services.

The general population STI rates remained low especially genital ulcer diseases. However, findings have also shown that the rates of chlamydial infections among women are moderately high. In addition, there are moderately high levels of high risk behaviors. There is a need to provide new approaches and strengthen current STI interventions to sustain the low STI rates and to lower chlamydial infections. The following are recommended:

- **Improve the quality of STI preventive and curative services appropriate to the local epidemiology and demand.**

STI services of a wider range of formal and informal sector facilities should be provided for a more effective STI services. All primary health care facilities where patients present with STI symptoms or concern about exposure should be upgraded to offer basic range of quality preventive and curative services.

STI case management remains an important pillar in STI Control within existing network of health care facilities, both public and private. STI cases should receive effective curative services to shorten the duration of infections and reduce the chance of subsequent infections. The syndromic approach has become the standard of care in the Philippines. Based on the findings of the study, approaches to managing vaginal discharge syndromes need to be revised. The National Case Management Guidelines must be revised so that a more rationale and cost-effective approach to manage women with STIs could be provided. The vaginal discharge flowchart should be modified based on the results of the study to include risk assessment, clinical factors and simple laboratory tests. The modified approach will reduce over and under treatment and provide a better diagnostic validity based on the current realities in the field.

The foregoing findings revealed that majority of the STI cases are asymptomatic. Since current laboratory tests are expensive and simple and cheap laboratory tests are still unavailable, there is a need to develop a strategy to reach and treat asymptomatic STI cases. The following may be considered:

- Develop and pre test a combination of risk factor and clinical assessment tool for asymptomatic STI based on the study results for use at the point of first encounter where patients seek care for reproductive health services.
- Develop selective screening program with STI laboratory tests for those most at risk of STIs.
- RTI/STI case finding through laboratory diagnosis should be made available and accessible especially in groups at increased risk of RTI/STI.

- Provide presumptive treatment of STI especially those at greatest risk for STIs.
 - Encourage syphilis screening among high-risk groups.
 - Persuade all STI patients to notify their partner (s) and to encourage them to seek counseling and treatment.
 - Promote early health seeking behavior through education of women on self-risk assessment and recognition of symptoms indicative of STI.
 - Health care workers in family planning and maternal health clinics should routinely assess for indications of RTI/STI while doing routine history taking and physical examination.
- **Extend effective and appropriate interventions to population groups with the highest STI exposure as the most effective and efficient use of limited resources.**

Control of STIs in a community requires more than efficient treatment of STIs in those that present to health services. 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 susceptible 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. 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. There is a need therefore to provide targeted STI intervention giving priority to sex workers and their clients.

Acceptable, accessible and effective STI services for women at high risk must be provided. Preventive and curative services for sex workers must be provided hand in hand. Effective STI treatment reduces rates of complications as well as

efficiency of HIV transmission. Women are more receptive to condom use and other preventive messages when they are delivered along with quality, non-judgmental curative services (prevention-care synergy).

Outreach and peer education among high transmission networks are also the foundation of targeted intervention. Participation of the high risk groups must be encouraged to improve interventions that promote trust, lead credibility to preventive messages and encourage use of curative services.

- **Strengthen the public health response to STI through advocacy and strategic planning at the central and peripheral levels.**

Consensus and active support for STI control objectives must be developed for a sustained and comprehensive program. Advocacy involving decision makers from government, universities, professional associations and communities must be strengthened. Strategic planning to identify and prioritize the most effective approaches based on STI prevalence and transmission dynamics, contextual factors, cost, cost effectiveness, feasibility and sustainability must be done at the central and local levels.

- **Improve the reliability and relevance of surveillance and evaluation data to guide control efforts and measure progress.**

The STI surveillance strategy has been developed with the following components:

- STI reporting system from the social hygiene clinics and Field Health Support and Information System.
- Sentinel Site Etiologic Surveillance System
- Periodic Surveys to complement the reporting system
 - STI surveys in the general population conducted every 5 years
 - STI surveys among high risk groups conducted every 3-5 years

- Etiologies of syndromes conducted every 5 years
- Antimicrobial susceptibility monitoring conducted yearly

There is a need to strengthen current STI surveillance efforts so that meaningful data on the magnitude of the STI problem, trends in STI, behavioral and health seeking behavior, frequencies and distributions of STI and antimicrobial susceptibility pattern are collected for improving STI case management, planning, implementation and evaluation.

Quality and coverage of services are essential areas of STI process evaluation. There is a need to develop indicators and methods of collection and support evaluation capacity building at all levels of project implementation.