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Reproductive Tract Infections and Sexually Transmitted Infections of Women in Bangladesh: A Literature Review

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
BRAC	Building Resources Across Communities
BV	Bacterial Vaginosis
CSWs	Commercial Sex Workers
CUP	Condom Use Promotion
DFID	Department for International Development
FSW	Female Sex Worker
H&FWCs	Health and Family Welfare Centre
HASAB	HIV/AIDS and STD Alliance Bangladesh
HBSW	Hotel-Based Sex Worker
HIV	Human Immuno-deficiency Virus
HSV-2	Herpes Simplex Virus-2
ICPD	International Conference on Population and Development
IDUs	Intravenous Drug Users
IUD	Intrauterine Device
MCH-FP	Maternal and Child Health-Family Planning
MWRA	Married Women of Reproductive Age
NGO	Non- Government Organization
PID	Pelvic Inflammatory Disease
RTIs	Reproductive Tract Infections
SCs	Satellite Clinic
SRH	Sexual and Reproductive Health
STD	Sexually Transmitted Disease
STIs	Sexually Transmitted Infections
TBA	Trained Birth Attendant
WHO	World Health Organization

SUMMARY

This literature review focuses on what is known about reproductive tract infections and sexually transmitted infections (RTIs/STIs) in Bangladesh from published studies. RTIS/STIs can have negative consequences on the health, social life, and economic situation of women. Negative consequences on health include not just physical discomfort but also infertility, ectopic pregnancy, cervical cancer, fetal wastage, low birth weight, infant blindness, neonatal pneumonia and mental retardation. Socially, lack of awareness and cultural taboos increase a woman's risk of contracting RTI/STI due to unsafe behaviour and then inhibit them from discussing their problems and seeking appropriate treatment. Economically, STIs rank among the five most important causes of loss of productive life lost in developing countries, accounting for the wastage of several million dollars a year. Thus it is imperative that RTIs/STIs be addressed. Currently, there is no prevalence data available on RTIs/ STIS in Bangladesh.

This paper compiled findings from 6 qualitative studies and 12 quantitative cross-sectional studies on sex workers, rural women and health providers. It looks at five issues. First it looks at the occurrence of RTIs/STIs among different populations – pregnant women, sex workers, rural women, women visiting an urban healthcare clinic, and views of health providers with RTI/STI infected patients. Some of the prevalence studies found high STIs among sex workers in brothels and among women living near truck stands as compared to rural women and urban slum women.

Second, it looks at their perceptions about RTIs/ STIs. The qualitative studies found that women did not view RTIs as purely a biomedical problem, but blamed it on the larger stresses in their lives, social economic and financial. However, many of the urban and rural women were aware of RTIs/STIs but perceived no clear difference in symptoms and consequences between RTIs and STIs**.** Other studies revealed that 65% of 260 homeless people were aware of STIs while 79% of 401 teagarden workers were not aware of STIs. Hygiene (washing one's private parts after intercourse), use of condom and observing religious rules were perceived as preventive measures for RTIs/STIs among rural women in a study.

Third, it discusses some of the factors that are causing RTIs/STIs among Bangladeshi women. Literature shows these factors include side effects of contraceptives, low condom use and poor negotiation skills, lack of partner communication and partner management, menstrual hygiene, and high-risk behaviour.

Fourth, it looks at some of the health providers Bangladeshi women seek health care from for their RTIs/STIs. The review found that treatment was sought mostly from female relatives and friends, healers, homeopaths, pharmacists and the least from allopathic doctors as it is culturally prohibited for women to be seen, let alone be physically examined, by any male other than her husband.

Fifth it discusses how RTIs and STIs are managed – through programmatic forms and diagnosis. Programmatic forms include dissemination of STI knowledge through NGO-led health forums, epidemiological treatment for populations with high STI prevalence, incorporation of both biomedical and cultural aspects to treatment of vaginal discharge so that the deep psychological and / or spiritual dimensions don't go unattended. Furthermore, studies in cross-cultural psychiatry help clarify the associations between emotional distress (including depression) and unexplained gynaecological symptoms. Multisectoral and interdisciplinary coalitions are needed to address lack of coordination among policy makers, weak programme management and structure as well as political unwillingness which inhibit the progress of policy into action. A study on diagnosis of STIs found that the speculum-based algorithm might be a cheap and effective diagnostic and management tool. Syndromic diagnosis and management of cervical STIs is highly compromised due to lack of diagnostic tools and by the low specificity or absence of clinical signs.

I. INTRODUCTION

RTIs are a major public health problem among women of reproductive age in developing countries (Rahman *et al*, 2003). Studies in India, Bangladesh and Egypt have shown that 52-92% of women are suffering from RTIs (Bhatti & Fikree, 2001). RTIs cause more than just physical discomfort. They lead to infertility, ectopic pregnancy, cervical cancer, fetal wastage, low birth weight, infant blindness, neonatal pneumonia and mental retardation. RTIs affect more than health (The Population Council, 1999). The morbidity associated with RTIs also affects the economic productivity of many individual men and women, and consequently, of whole communities.

Sexual and Reproductive Health first gained prominence in the International Conference on Population and Development in Cairo (ICPD, 1994). Prevention and management of Reproductive Tract Infections and Sexually Transmitted Infections was identified as one of essential components of reproductive health and a goal was established to prevent and reduce the spread of STDs, including HIV/AIDS and to provide treatment for STDs and their complications, such as infertility, with special attention to women. In fact, STIs have ranked for several decades among the top five diseases for which adults in developing countries seek health care service (Rahman, Ahmed, Khuda, Ahmed & Kane, 1999).

Bang and Bang (as cited in Ross *et al.*, 2002) argues that community based, epidemiological study of gynecological morbidity in Maharastra, India, brought women's reproductive health into prominence in South Asia for the first time. In Bang and Bang's (1989) study, it was found that 90% of 645 women reported one or more gynaecological problem but never sought treatment. Koenig et al. (1998) (as cited in Ross *et al.*, 2002) states that from that since then several subsequent community based studies throughout India not only validated these findings but also showed the importance of integrating qualitative and quantitative approaches in reproductive health research.

Although national HIV surveillance data still show < 1% HIV seroprevalence in Bangladesh, studies show that risky sexual behaviour exists among Bangladeshis, not only among high risk groups such as commercial sex workers (CSWs), internal migrants (including truckers and their helpers, garment workers, fish processing workers), and intravenous drug users (IDUs) but even among the rural population (Naved, 1996). In a study among rural population in Bangladesh (Naved, 1996), it was found multiple sexual partners are quite common among men, primarily because they have a greater mobility than women. Extremely poor and abandoned women serve as partners for these men. Many impoverished women also have to resort to becoming commercial sex workers to earn a livelihood. Surprisingly, their family members do not ostracize them because they are a significant source of income (Naved, 1996). Thus, these members of the population who are involved in high-risk behaviour are at a risk of RTIs/STIs/HIV. In addition, they also serve as a bridge to the general population such as their spouse/partner who may practice safe sex. STIs are significantly prevalent among these

high-risk groups (Nasreen, Akhter & Chowdhury, 2005). The presence of an STD is a marker for risk behaviour for HIV infection; i.e., the same risky behaviour that causes STI's is responsible for HIV transmission (Nasreen, 2001). Thus these high-risk groups and their partners are at a risk of acquiring HIV infection.
This literature review focuses on what is known about RTIs/STIs in Bangladesh from published studies. The objectives of this literature review are:

1. To understand the epidemiology of RTIs and STIs in Bangladesh.
2. To understand how women conceptualize RTIs/STIs in particular.
3. To examine patterns of health seeking behaviour of women with RTIs/STIs
4. To look at some ways RTIs/STIs are being managed in the country.

Key Concepts and Issues

Before proceeding further, it is necessary to clarify the definitions of RTIs/STIs. Also it is important to understand how the presence of RTIs/STIs may increase the risk of HIV infection.

Reproductive tract infections and sexually transmitted infections
Reproductive tract infections (RTIs) can be divided into three different types of infections which affect the reproductive tract (The Population Council, 1999):

(a) Endogenous infections: These are probably the most common RTIs worldwide. They result from an overgrowth of organisms normally present in the vagina. Endogenous infections include bacterial vaginosis and candidiasis. These infections can be easily treated and cured (The Population Council, 1999).

(b) Iatrogenic infections: These occur when the cause of infection (a bacterium or other microorganism) is introduced into the reproductive tract through a medical procedure such as menstrual regulation, induced abortion, and insertion of an IUD or during childbirth. This can happen if surgical instruments used during the procedure have not been properly sterilized, or if an infection that was already present in the lower reproductive tract is pushed through the cervix into the upper reproductive tract (The Population Council, 1999).

(c) Sexually transmitted infections (STIs): These are caused by viruses, bacteria, or parasitic microorganisms that are transmitted through sexual activity with an infected partner. About 30 different sexually transmitted infections have been identified, some of which are easily treatable, many of which are not. HIV, the virus that causes AIDS, is perhaps the most serious sexually transmitted infection as it eventually leads to death. STIs affect both men and women, and can also be transmitted from mothers to children during pregnancy and childbirth (The Population Council, 1999).

Relationship between presence of RTIs/STIs and Acquisition of HIV/AIDS
A study by Hasheema-E Nasreen (2001) states that the presence of a genital ulcer caused by syphilis, chancroid, or herpes increases one's risk of HIV infection 10 to 20 fold and the risk increases 3 to 4 fold where gonorrhea or chlamydia is present. This is because although under normal conditions the vaginal wall and epithelium of the penis work effectively as barriers against disease transmission, this barrier is compromised by high rates of genital ulceration and inflammation from chancroid and chlamydial infection of the genital tract.

II. OCCURRENCES OF RTIS/STIS AMONG DIFFERENT DEMOGRAPHIC GROUPS

In a developing country like Bangladesh, it is difficult to report and collect specimen for RTIs and elaborate laboratory methods are scarce (Rahman 1999). Thus there is no nationwide survey on the prevalence of RTIs and STIs in Bangladesh. But an estimate by UNFPA in 1996 shows that prevalence of RTIs is 56% in the rural areas and 60% in the urban areas of Bangladesh (Chowdhury & Gazi, 2003). Of the studies that have been conducted on RTIs/STIs in Bangladesh, data show that RTIs/STIs constitute a substantial amount of the disease burden among Bangladeshis.

This section of the review looks at occurrences of RTIs/STIs in several demographic groups of Bangladeshi women including pregnant women, commercial sex workers (brothel, street and hotel based), rural women, garment workers, women living near a truck stand, women visiting an urban care clinic, and the cases of RTIs/STIs as reported to non formal health providers.

In an urban maternal and childcare clinic, a study on the occurrence of selected RTIs was carried out among pregnant women, aged 15-45 years and a gestational age of 16-24 weeks (M. Rahman et al., 2003). Among 282 women studied, 17.7% had bacterial vaginosis, 1.4% had trichomoniasis, 3% had syphilis, 1% had multiple infections and 23.5% had any reproductive tract infection (see table 6 in annex). The author stated that the 3% prevalence of syphilis among pregnant women is a cause for concern. He suggested that antenatal screening for syphilis is necessary for this population, which is cost effective. The author further mentioned that pregnant women with and without symptoms of RTI's are not routinely screened or treated for *bacterial vaginosis*. (The prevalence was 17%), although trichomoniasis and candidiasis are usually diagnosed and treated. As bacterial vaginosis in pregnancy is associated with premature rupture of membranes, premature delivery, and chorioamniontis, it needs particular attention. Further studies are required for the implementation of a programme for screening and treatment of bacterial vaginosis and syphilis during antenatal checkup (M. Rahman et al., 2003).

In a cross-sectional study conducted by Rahman et al. (2005) commercial among sex workers (CSWs) in 4 randomly selected brothels, the prevalence of RTIs/STIs among the 439 enrolled CSWs were as follows: 17.5% had *N. gonorrhea,* 15.5 % had *Chlamydia trachomatis* (See Table 3 in Annex). As in the case of pregnant women in the study mentioned above, bacterial vaginosis was diagnosed in a majority of the women (48.1%). Vaginal infections were also caused by *C. albicans* (7.7%) and *T. vaginalis* (7.5%). The prevalence of syphilis was 31.9% and that of active syphilis (rapid plasma regain –RPA >1.8) was 6.6%. Meanwhile, 27.3% had 1 vaginal infection, 53.8% had 1 cervical infection and 67.4% had 1 cervical and/or vaginal infection.

The study by Rahman et al. (2005) also found that over 27% of the CSWs were positive for *N. gonorrhoeae* or chlamydia which is lower than hotel- based CSWs in Dhaka. The

authors suggest this may be due to high client flow and low condom use in hotel based sex workers. “The prevalence of bacterial vaginosis among the studied group of 48% may be due to disturbance of the vaginal microflora resulting from frequent intercourse and subsequent washing with water and disinfectant” (Rahman et al., 2005, p.18).

The study shows high prevalence of STIs (including asymptomatic) among CSWs in brothels in Bangladesh. The author suggests an urgent need of interventions of such populations with high STI prevalence, using epidemiologic treatment of the target population (also called mass treatment) or periodic presumptive treatment to reduce STI prevalence. Other strategies for STI prevention and control suggested were preventive education and syndromic management of symptomatic women. For asymptomatic women, WHO has a new strategy for addressing STIs in high-risk women which does not use symptoms as an entry point (World Health Organization 2002), although this strategy has not been implemented in Bangladesh as yet till the date of this study (January 2005).

An etiological study among street-based female sex workers was carried out on STIs. Out of the 269 sex workers studied, 84% were positive for the STI pathogens studied. Another 46% were positive for cervical pathogens (*N. gonorrhoeae or C. trachomatis*) while positive cases for vaginal pathogen *T. Vaginalis* was 45.5%. (See Table 1 in Annex) Syphilis was found among 33% of the studied group and Herpes Simplex Virus-2 (HSV-2) was diagnosed among 63% of the CSWs. Gonorrhea was found among 35% of the CSWs which is consistent with previous studies in Bangladesh where the rates were around 42% (Rahman et al., 2000).

Rahman et al. (2000) state that prevalence of STIs among street based FSW studied was high. This is because no effective intervention strategy has been implemented among this group as of date of the study. Also as observed in other studies percentage of women with cervical infection (30% of the group studied) being asymptomatic is a major concern since if left untreated the infections can dramatically worsen. Also, they cannot be diagnosed with syndromic algorithms.

A cross sectional study was conducted among 400 hotel based sex workers (HBSWs) in Dhaka. Upon analysis of the overall prevalence of RTIs and STIs among this group, it was found that about 36% of the HBSWs were positive for gonorrhea while 43% were positive for chlamydia. Syphilis was found among 8.5% of the group studied. The prevalence of bacterial vaginosis among HBSWs was found to be 57%, which is a cause for concern since there is considerable evidence that bacterial vaginosis has a role in the acquisition of HIV. Of the studied population, 86.8% were positive for at least one RTI or STI. (See Table 2 in Annex) Data suggests that there is a high prevalence of STIs, particularly gonorrhea and chlamydia, among HBSWs in Dhaka. A total of 43% of the women in the study were asymptomatic. STI intervention strategies using syndromic management in a population with such a large number of asymptomatic infections may result in undertreatment (Rahman et al., 2004).

In a study in a rural area of Bangladesh, undertaken to learn about the local names of sexual and reproductive health problems and men and women’s perceptions about these, nine female and nine male key informants were interviewed. The respondents considered that the number of reproductive/ sexual health problems among men was less than that among women (14 among men versus 42 among women). “Among female

diseases, *sada srab* (white discharge) scored the highest salience index, followed by *mashikey gulmal* (menstrual problem), *sutika* (post-partum diarrhea) and burning in the hand and feet, *sharam jaigai ghaa* (ulcer in the area of shame), *shwapnadosh* (emission of vaginal fluid at night in dream), and *adina nasta howa* (abortion)" (Bhuiya, Aziz & Hanifi, 1997). In another rural study, 2929 rural married women of reproductive age were surveyed. Lower tract, endogenous infection was the predominant type of infection found in this study. Acute pelvic infection and sexually transmitted cervicitis (gonococcal or chlamydial) or vaginitis (trichomonal) was rare. Bacterial vaginosis was the most common syndrome diagnosed among this group (Wasserheit, Harris, Chakraborty, Kay & Mason, 1989).

Syndromic diagnosis carried out among garment workers as part of a peer education on HIV/AIDS prevention amongst them, found that about 15% of garment workers (male and female) suffer from STIs. The patients do not seek any treatment. Moreover, they have risky sexual behaviours (HASAB 2003). Garment workers tend to live collectively and not in the Bangladeshi traditional family unit. Societal norms regarding lifestyle are thus less restricted and incidence of non-marital relationship is greater than that of the society in general. They have both emotional and forceful sexual relationships with their colleagues, inmates, and relatives in and outside their work environment. The female workers complained of vaginal discharge and lower abdominal pain. The discharge may be due to bacterial vaginosis, candidiasis, and trichomoniasis (Nasreen et al., 2005).

In a study of 384 women aged 15-54 living in a slum encircling Tejgaon truck stand in 1998, it was found that these women are at an intermediate level of risk when compared to a study with rural women and a study of urban slum women. That is, they were at a higher level of risk than the general population but at a lower risk than CSWs. There was a high prevalence of Herpes Simplex 2 (32%) and syphilis. (See Table 4 in Annex) Gonorrhea was present in 6.3% of the women while none were found to be infected with chlamydia in PCR analysis on urine. However when the test was performed on PCR swabs the prevalence of chlamydia was 3.4% while that of gonorrhea was 5.4%. Bacterial vaginosis was highly prevalent (37%) and clinical PID was found among 5.7% of the group studied. They are likely to be at a high risk to STD/HIV because (a) they are likely to engage in sexual relations with men in the trucking industry or (b) they will have male partners who are sexually active with the same women (particularly CSWs) as the truck drivers (Gibney et al., 2001).

In a group of 1879 married women who were visiting an urban healthcare clinic, tests for cervical and vaginal pathogens were carried out. Results showed a prevalence of 3.0% for syphilis, 0.5% for gonorrhea, 1.6% for *C trachomatis*, 1.8% for *T vaginalis*, and 11.7% for Herpes Simplex-2. (See Table 5 in Annex) There appeared to an unexpected high prevalence of herpes simplex virus 2 infections and syphilis among these women. It can be presumed that the women suffering from an STI are infected by their husband. Studies showed that seven percent of men have declared to have contact with sex workers after marriage and less than 10% used condoms during contact with CSWs. Bacterial vaginosis was found among 41% of IUD users versus 13% of users of other contraceptive methods and 23% of non-contraceptive users (Bogaerts et al., 2001).

In a study in Matlab, Bangladesh among health providers, in-depth interviews were conducted among 15 pharmacists/village practitioners, 10 health volunteers (*shasthya*

shebikas) 5 traditional birth attendants (TBAs), 5 *kabirajs*[1], and 3 medical doctors. Also focus group discussions were carried out among 40 health providers. The health providers were asked to list their patient's most common complaints related to STIs and sexual problems, they mentioned white discharge, burning during micturition, genital ulcers, weakness, menstrual problems, abdominal pain, infertility, unwanted pregnancy. One provider said, "For woman the main problems are "illegal pregnancy", inability to conceive, irregular menstruation and physical weakness" (Nasreen, 2000).

Situation of Occurrence of STIs in Bangladesh

In 1996, it was estimated that 2.3 million Bangladeshis were infected with STIs. Prevalence rates of STIs (in decreasing order) were estimated as follows: 87% for floating sex workers, 70% for brothel based sex workers, 36% for men having sex with men, 22% of injecting drug users, and 20% of long route truck drivers. All these groups display high-risk behaviour. Epidemiologic treatment (also called mass treatment) of such populations with high STI prevalence or periodic presumptive treatments are possible ways to reduce STI prevalence. Other strategies for STI prevention and control are preventive education and syndromic management of symptomatic women (Nasreen, 2001).

[1] *Kabirja* is a traditional healer who provides herbal treatments.

III. LOCAL UNDERSTANDINGS OF RTIS/STIS

White Discharge

Of the numerous studies on RTIs/STIs carried out in recent years, white discharge was found to be the most common gynecological complaint among Bangladeshi women, both in the rural and urban setting. In a Save the Children (USA) study, carried out in an undisclosed rural area widely known for its conservatism, 74 men and 78 women were interviewed in order to learn about perceived RTI problems and local definitions of perceived RTIs. Women gave an in-depth description of white discharge including local names (*shada srab, dhatu jhora, dhatu jawa, shoiler raja jaowa, srab jaowa, dhatu rog, prodor or bijol jaowa*) (Naved, 1996). In another rural study, where nine female and nine male key informants were interviewed, white discharge scored the highest salience index. This study emphasizes the advantage of knowing local names in designing qualitative studies to better communicate with local people by conversing in terms that they are familiar with (Bhuiya et al., 1997). The variations of local names of white discharge are listed on the syndromic management of vaginal discharge flowchart. (See diagnosis & management section of this report). This aids health providers in communicating with local women in terminology of white discharge that may be familiar to them.

The variation in colour, odour and density of white discharge was also described which ranges from white, curd like, greenish or red to thin, sticky or thick like nasal secretion. The coloured discharge as well as profuse smell is considered to be a manifestation of disease and the red one is feared most. People in the area consider that the essence of the body is lost with the discharge. In case of frequent discharge, women become weak and lose interest in their work. Sometimes, white discharge is associated with abdominal pain, engorged veins of the abdomen itching and prickly heat kind of thing in the lower part of the body and/or with ulceration. The side effects of this disease are reported as lack of appetite, giddiness, and semi- blackouts and/or weakness of limbs (Naved, 1996).

Studies in Karachi, Pakistan of 18 women with RTIs from different clinics and community settings showed that women often had difficulty offering their prayers because cleanliness before saying their prayers is mandatory and women experiencing vaginal discharge were not considered clean. As a result, women had to go through cumbersome processes ranging from changing one's pants ("*shalwar*") before and after prayers to washing oneself all day to stop saying their prayers when the discharge started (Bhatti & Fikree, 2002).

In another qualitative study in rural Bangladesh of 68 Muslim women of reproductive age, a similar phenomenon is observed to that in India, in that women view "vaginal discharge as symptomatic of serious problems, for which medical relief is sought, if possible" (Ross et al., 2002, p.186). Perceived causes of white discharge in this area include: - God's will, after 1st delivery, strenuous work (carrying water pitcher, etc), untied hair at midday, walking by graveyard after dark, and contraceptive use (IUD,

sterilization). Often, the women are not cured for the discharge even after visiting kabiraj, chemists, homeopath and allopathic practitioners so the women perceive it as incurable and that they must learn to live with it. The author suggests that since the complaint of white discharge is common among the study group, developing more effective reproductive health care strategies is essential. This involves having a clear picture of the clinical aspects of RTIs as well as awareness of women's perceptions of white discharge, keeping in mind that these complaints may be a manifestation of social and psychological stressors. Thus the treatment by health care providers may be a combination of medical treatment and personal counselling (Ross et al., 2002).

Local Conceptions of RTIs/STIs

Below is a discussion of how of women of different demographic groups conceptualize RTIs/STIs:

Chowdhury and Gazi (2003) noted in a study in rural Bangladesh (Mymensingh district) that the local women called their sex related diseases "*gupto rog"* which translates as "concealed diseases". They mentioned that some of these diseases mentioned were *gormi* (symptoms: burning, itching, pain with a discharge containing pus or blood) and *dhatu* (white discharge), which leaves whitish stains on clothes and may develop into "shiblis" (syphilis) if untreated. "Shiblis" develops into red ulcers in the genital area. Other types of ulcers mentioned are "pocha ghao" and "pirpir". Thus according to Chowdhury *et al* (2003) discussion with the participants of the study showed that sex related diseases are not unknown or uncommon to them and they have identified them as serious problems. In contrast, another rural study in Bangladesh by Rahman et al. (1999) found that only a quarter of married women of reproductive age (MWRA) had heard of any STD, including HIV/AIDS.

Another interesting aspect as noted by Chowdhury and Gazi (2003) is the difference in the way younger women and older women perceive the mode of acquisition of RTI/STIs. For example, younger women think that these diseases may attack the genitalia, then the mouth of the uterus and ultimately cause ulcer. This may cause infertility in the women. Older women think that these diseases may enter genitalia and in 8-10 years attack the brain and the person becomes mad. Yet another finding from this study was the fact that younger mothers mention the use of condoms but older mothers thought that condoms may remain in the body after intercourse.

In a study in rural area well known for its conservatism, RTIs and STIs were found to be common. However, how these diseases are caused and the ways they are transmitted were unknown to these people. Even those who knew that some of these diseases might be sexually transmitted were not certain about how they may be prevented. Those who knew about condoms did not use those (Naved, 1996).

In a survey in rural Matlab, out of 1614 people (male, female, boys and girls), 48% were aware of STIs. Although they were "aware" they could not tell the difference between RTIs and STIs and believed all diseases of the genitals were STIs. A majority of them only knew of vaginal discharge as symptom of RTI/STD. One finding was that if they were member of BRAC, they seemed to have a greater knowledge of STIs than a non-member. Another finding was that if the head of household is male, females (& males) tend to be less aware of STIs. The parents in this survey were against sex education as

they felt it would encourage premarital sex which is against their cultural and religious beliefs (Nasreen, 2001).

Nasreen et al. (2005) show in a cross sectional descriptive study of 3769 internal migrants and their susceptibility to STIs/HIV that between the 2 groups of migrants studied that were female (garment workers and fish processing workers), the former's knowledge[2] was significantly more than the latter. These women mentioned vaginal discharge and lower abdominal pain as STIs. A huge portion of the women was also able to name genital ulcer and urinary incontinence.

In a baseline survey conducted by Marie Stopes Clinic among homeless people, 65% of 260 people were aware of STIs. When these people (who were aware of STIs) were asked to name some of these diseases, they mentioned AIDS (65%), syphilis (58%), gonorrhea (37%), infections in sexual organs (29%), and discharge (9%). 3% didn't know any names of STIs. Sexual intercourse with sex workers was believed to be a mode of transmission of STIs by 62% of the respondents who were aware of STIs. Not using condoms was reported as another mode by 39% of respondents. Sex with infected people was perceived to be yet another way STIs could be transmitted by 32% of the respondents. 14% actually did not have any knowledge about modes of transmission. Other responses include: having multiple sexual partners (20%), using used syringes (13%), and having untested blood transfusions (9%) (Hasan, 2002).

In another survey involving quantitative analysis of workers of a tea garden in rural Bangladesh, majority of the tea garden workers interviewed in this survey were not very aware of STIs- 79% of 401 people said they did not know about these infections while 18% claimed to have heard about them. Two percent did not understand and one percent did not reply. Thus awareness of STIs among tea garden workers is quite low. To find out if the tea garden workers knew STIs in a different manner and names, it was found out that their knowledge of skin disease, itching, discharge, ulcer, and inguinal swelling is also very low. Seventy eight percent of the respondents did not answer this question while 16% claimed they knew the reasons behind skin diseases while 6% said they did not understand this disease. Compared to their knowledge of STIs, the tea garden workers knowledge was considerably better- 43% of the respondents said that they had heard about HIV/AIDs while 55% did not. Also 45% said they knew the consequences of AIDS while 42% said they knew how HIV/AIDS spread (Marie Stopes Clinic Society, 2003).

The perceptions of rural Bangladeshis about STIs can be further explored by looking at their views as reported to non-formal health practitioners. In a study conducted to learn about existing practices of non formal health providers who usually treat STD patients in a rural community, Nasreen (2000) found that patients of 40 non formal health providers has the following perceptions about STIs: STIs were considered to be caused by "dirt" or contamination residing in sperm or vaginal fluids and were closely linked to violations of moral codes. They believed their ailments were due to: "illegal mixing (extramarital or premarital sex), "night pollution" (nocturnal emission), masturbation, " too frequent mixing" with wife, contamination with the earth, visiting bad places, dirty utensils, dirty toilets, wearing the clothes of someone who has an STI, oral sex, boys having sex with boys, anal sex, urinating everywhere, irregular food, misuse of semen in

[2] By knowledge the author means the respondent had heard about STIs

bad way to satisfy a sexual desire, not washing after sex, dirty cloths during menstruation, too much labor, taking pills by women, men and women urinating in the same place.

Hadi and Parveen (2003) studied the role of non- governmental organizations as disseminators of sexual illness knowledge among 1,663 adult women who were randomly selected from BRAC demographic and health surveillance system. The following findings were revealed: when women were asked to state some modes of STI transmission, they mentioned engaging in sex with an infected person (15.5 %), blood transfusion (0.5 %), infected equipment, and (1.3 %) infected mothers to newborn (1.1 %) About 16.5% of women could identify at least one transmission mechanism. When they were asked to mention some symptoms of sexual illnesses, they displayed much better knowledge than that of transmission. They mentioned irritation of sex organs (28.75), swelling of the thigh (6.9%), swelling of the body (1.4%), rashes, (1.1%) - About 31.5% were able to identify at least one symptom. Overall, the knowledge of educated women was higher than illiterate ones, and the knowledge of NGO- forum members was higher than non-members.

The acceptance of new information and better understanding is enhanced by education, as many previous experiences showed. But in the context of Bangladeshi women, education may not be the best way to learn about RTIs/STIs because more than two thirds of adult women never went to school, according to the authors of the study by Hadi and Parveen (2003). Thus an alternative method of communication by which illiterate women could be reached had to be created. It was found that NGO-led forum was a feasible way to do this. Thus in 1998, BRAC integrated its STI control project with it micro-credit based development programme. This study attempted to verify whether membership in an NGO-forum was truly increasing the knowledge of rural illiterate women. Results showed that this indeed was the case – NGO-forums *can* be an effective media in promoting STI-knowledge among women in Bangladesh (Hadi and Parveen 2003).

Preventive Measures Believed to Keep Away RTIs/STIs

This review found findings from several studies where perceptions of preventive measures for RTI/STI were looked at.

In a study conducted by Chowdhury and Gazi (2003), hygiene, use of condom and observing religious rules were cited as ways to prevent "*gupte rog*"(concealed diseases). By hygiene, the women meant washing one's private parts after intercourse. For younger women (18-35 years), this involved applying betnovate ointment after the wash, while according to older women (grandmothers 40 years old and above), hot water and soap should be used during the wash. Use of condom was believed to be an effective alternative to washing oneself after coitus by the younger women. They stated that if a condom is used, the wash it not required. The older women on the other hand said that the younger women would know better as they have seen and used condoms but the older women did not. One older woman claimed that condoms may break and create problems and may even get stuck inside the body. Another older woman said she has observed a case where ulcers form at the base of a condom, so she sees no point in using one. A trained birth attendant (TBA) was an exception to the older women in that she explained to the other participants in the group that a condom was actually like a

glove in that just as a glove worn on the hand protects it from harm if anything bad is touched, a condom can protect from bad diseases. She also stated washing had no value. Both the groups believed that ablution and bath after sex as prescribed by Islam (they were mostly Muslims) was a way to prevent these diseases.

Naved (1996) noted in rural study that female respondents believed ways to prevent sexually transmitted infections are: keeping neat and clean (*porishkar bhabey chola*), avoiding sun and fire (*rodey, aguner kachey na galey*), limiting sexual intercourse (*melamesha kom korley*), using a condom, (*condom babohar korley*) and leading a disciplined life (*neeyom meney cholley*).

In a baseline survey carried out among 260 homeless people, refraining from going to sex workers was reported by 62% of the respondents as a method of prevention from STIs. Meanwhile 50% mentioned use of condoms during sex and 27% claimed not having sex with STI patients as a way to prevent acquiring STIs. Other methods of prevention mentioned included limited sexual interaction between husband and wife (26%), not using used syringes (12%) and testing blood before carrying out blood transfusion (12%) (Hasan, 2002).

Hadi and Parveen (2003) reported that NGO forum members (rural women) had very poor knowledge on ways to prevent sexually transmitted infections. A relatively large number of the women mentioned precaution during intercourse (13.4%) as a method of prevention, while choosing faithful partners was stated by a significant amount (12.6%) of women as well. Use of condom (4%) and religious instructions (2.3%) were some of the other preventive measures recognized by these women. About 29.9% had knowledge of at least one preventive measure. As in the case of level of STI knowledge, education and NGO participation of women increased these rural women's knowledge of STI prevention methods.

In a study aimed to identify non-formal health providers who treat STIs in rural settings and their willingness to participate in public health intervention to improve STI management and services, the health providers were asked to keep track of their patients for a month (who showed symptoms of STIs). The patients mostly did not have any knowledge on how to prevent these illnesses. Some of the ways they claimed to prevent STIs are: treatment, careful movement and the avoidance of "illegal sex', never go to the "bad girls" and obey religious rules. Only one patient mentioned condom as a preventive measure (Nasreen, 2000).

IV. CAUSES OF RTIS/STIS AND HEALTH SEEKING BEHAVIOUR

Some Factors that are Causing RTIs/STIs Among Bangladeshi Women

Several factors that cause RTIs/STIs among Bangladeshi women were found in the studies looked at for this review. Among these, five major causes were side effects of contraceptives, low condom use and poor negotiation skills, lack of partner communication and partner management, menstrual rags and hygiene, and high-risk behaviour. Studies which looked at these factors are outlined below:

In a study carried out in Matlab (in rural Bangladesh) among 320 women complaining of abnormal vaginal discharge and visiting a maternal and child health/planning centre, women with intrauterine devices or tubectomies were more likely to have an endogenous infection than those using no contraception (although this was not statistically significant) (Hawkes et al., 1999). These infections are easily preventable simply by improving the quality and accessibility of good medical services. This includes ensuring that medical institutions and health providers get adequate training and supervision to carry out medical procedures with uncontaminated instruments in a clean or sterile environment (The Population Council, 1999). Also providers should be aware that if an infection is already present in the reproductive tract, there is a risk of contracting an iatrogenic infection. That is, if a client has an endogenous infection or an STI, bacteria may be pushed into the uterus when an IUD is inserted into her reproductive tract. In this case the provider may encourage a woman wishing to use IUD an alternative contraceptive method if she considers herself at a risk of exposure to an STI. Women often discontinue certain methods of contraception because of such side effects (The Population Council, 1999).

In another study among a family planning population in rural Bangladesh, a pattern of increased risk of cervical and pelvic infection for among IUD users and additionally, tubectomy users was observed when compared to non-users. The alteration of hormonal mileu may be one reason for the high prevalence of BV among tubectomized women. In contrast to other investigators (Eschenbach, n.d), no association was found between BV and regular contact with an uncircumcised partner. Also, although this population had high incidence of diarrhoea, vaginal contamination due to diarrhoea increasing the risk of RTI among users or nonusers was not found (Wasserheit et al., 1989). The study suggests, "In Bangladesh, certain family planning interventions are associated with relatively mild, reversible, but not infrequent, morbidity of RTI. This morbidity is either avoidable or at least treatable by use of inexpensive, clinic –based services directed at accurate diagnosis and treatment of RTIs. This provides an opportunity to strengthen MCH-FP programmes by decreasing method-associated side effects" (Wasserheit et al., 1989, p.77).

Studies by Rahman et al. (2004) show that although national HIV surveillance data still show < 1% HIV seroprevalence in FCSWs in Bangladesh, the simultaneously conducted

national behavioural surveillance shows a higher client turnover and a low condom rate of use (9%), than in other Asian countries. Furthermore, HASAB (2003) found that among unmarried female garment workers, a few know of condom as a family planning method. They stated that there are many family planning methods for women, men do not want to use condom. However, they have no knowledge that can protect them from STIs. Thus one of the reasons behind low condom use is that people are not aware of it as a method of protection against RTIs/STIs but only as a family planning method. Thus men believe that as there is a wide range of contraceptive methods that there female partners can choose from, condom use is not necessary.

Another reason behind low condom use is the poor negotiation skills of women in convincing their partner to use a condom. For CSWs, poor negotiation skills for condom use make them particularly vulnerable to RTI/STI/HIV because of high-risk behaviour. Consequently, they get infected by their clients and then subsequently infect new clients (Rahman et al., 2005). Countries such as Thailand and Cambodia have demonstrated that mandating 100% use of condoms by female sex workers has led to a dramatic decrease in the incidence of STIs and HIV infection. In both countries there has been advocacy for the 100% CUP from the highest level. All female entertainment establishment workers are obliged to use condoms consistently with clients. The practice is monitored closely and sanctions are applied to entertainment establishments not complying with the regulations. Interventions such as the 100% CUP is not currently available in Bangladesh (WHO, 2002).

Gibney et al. (2001) in a study of male condom use in Bangladesh, suggests targeting males to use condoms in casual relations, since males have the primary role in sexual decision-making and their sexual activity outside of marriage often puts their wives at risk for infection.

According to most non formal health providers in a study, usually people don't discuss sexually transmitted diseases with their spouses until the situation is grave or out of control because they feel ashamed and they are afraid it may lead to bickering, violence and infidelity (Nasreen, 2000). However, a study in rural Matlab showed that all partners who sought treatment did so because patients had talked about their disease with their partner. Partners of adolescents in this study who did not discuss their STD-related problems did not seek treatment. However, this study also revealed that patients indicate a positive relationship between partner's communication and domestic violence (Nasreen, 2001).

Economic constraints prevent women from using sanitary napkins and tampons. (Wasserheit et al., 1989) During their menstrual period, most village women stay at home, using the corners of their saris or petticoats (underskirt) to absorb menstrual blood. The remainder use rags, which they wash in river water after use. The correlation between method of menstrual protection and method of contraceptive in causing RTIs was analysed as part of a larger study. It was found 37% of IUD users and 29% of tubectomized women used rags as menstrual protection as opposed to 13% of non-contraceptive users and 15% of hormonal users. The use of rags to absorb menstrual blood was significantly associated with an increased risk of infection independent of birth control method and duration of method. The authors suggest that simply by using the educational efforts of health providers to encourage women who use rags to wash

them daily in boiling water and to dry them thoroughly in a clean area, rather than to wash them in contaminated river water and to dry them in the rafters (Wasserheit et al., 1989). In a personal conversation I had with a BRAC *Shasthya Sebika* (health volunteer), the volunteer said that she advises the women to wash the rag and dry it in sunlight to kill the germs.

Commercial Sex Workers (CSWs) and their clients in the context of Bangladesh are commonly believed to show high-risk sexual behaviour. CSWs are vulnerable to RTI/STI/HIV because of high-risk behaviour, low condom use, and poor negotiation skills for condom use. Consequently, they get infected by their clients and then subsequently infect new clients. Thus, interventions for the prevention of STIs and HIV among CSWs are given highest priority (Rahman et al., 2005). But contrary to popular belief, risky behaviour is prevalent among the general population of Bangladesh, in both rural and urban areas. This is clearly demonstrated in a study where it was shown half of the young men studied had had premarital sex. For females the levels were slightly lower because of greater social control and greater disgrace for themselves and their families if discovered, risk of pregnancy, doomed prospect of good marriage, and much earlier age at marriage (Nasreen, 2001).

Also in a rural study, it was shown that all kinds of promiscuous behaviour exist among men, both married and unmarried. For unmarried men this ranges from sexual relations with unmarried kin because they find it hard to know other girls, and also with married brother's wife. They also are often polygamous, have relations with other extremely destitute women in exchange of cash or kind, widows, and even with other men or boys. In this village homosexuality is not considered risky because it does not cause pregnancy. In a few case studies that were carried out here, married women often lived with RTIs/STIs such as white discharge or chlamydia. The perceived causes of these diseases ranged from awareness that husband has multiple sexual partners and may have given her the disease, to ill fortune and God's will, to her already treated uterine prolapse (Naved, 1996).

Internal migrants are a large group of workers moving to urban areas from their rural homes in shanty slums as truckers and their helpers, garment workers, fish processing workers, rickshaw pullers, domestic aid, etc. The male migrants often engage in sex with CSWs and then return to their wives at their rural homes (Nasreen et al., 2005).

Thus overall because of promiscuous behaviour among the general population and with high-risk groups such as CSWs and IDUs, Bangladesh is at a possible risk of an outbreak of RTI/STIs and HIV/AIDs.

Health Seeking Behaviour

The Health & Population Sector Programme & the National Integrated Population & Health Programme gave priority to reproductive infections (RTIs) and sexually transmitted diseases (STDs) prevention and management as necessary component of the Essential Service Package. These programmes target women of reproductive age (15 –49 years) addressing behaviour change communication, management of RTI/STI cases and condom- use promotion. However, despite the availability of such services, social stigma causes reluctance to seek treatment even though women suffer from RTI/STI

related symptoms. Results of a community-based study show that 41 % of the women who had an RTD/STD did not seek treatment, but 39% of them did visit a kabiraj (Nasreen 2001). When married women visiting an urban clinic were asked if they had vaginal discharge, 96% of the women approached agreed to participate in the study although they had initially come to the clinic for reasons other than vaginal discharge, but a vast majority was suffering from it (Bogaerts *et al* 2001). In another study, half of the clients seeking RTI services at the satellite clinics (SCs) and Health and Family Welfare Centre (H&FWCs) reported that they had first visited an unqualified practitioner for their problem (Rahman et al., 1999).

Literature reveals that Bangladeshi women seek health-care for their RTI/STI related illnesses from various types of health providers including female relatives and friends, traditional healers, pharmacists, and male medical doctors. Some of the aspects of seeing such providers are outlined below:

Naved (1996) found that advice of female relatives and friends using home remedies were considered women's most common form of treatment in a rural study. Although they consider allopathic treatment as the most effective, the women had restricted access to their services due to difficulties in sharing their problems with men, such as husbands and male doctors, restricted mobility, etc. Also high costs are another inhibiting factor.

Nasreen (2001) noted that seeking treatment from traditional healers seems to be of the norm in a study on RTIs/STIs in Matlab, Bangladesh. In a study assessing the advantages of non-formal health providers with formal health providers in Matlab, health providers stated that some reasons clients seek help from traditional healers are: their treatment is relatively cheap, their pharmacy or office is always open, they treat rich and poor alike, they are respectful and they respect their clients, they have personal skills like truthfulness, good listening skills, their treatment is effective and their price follows the market price. They claim not to have any side effects and secrecy (privacy) is maintained (Nasreen, 2000, p.7).

It was further found that traditional healers give the following advice for STIs: "maintaining a regular, neat and clean life, regular sexual meeting between husband and wife, avoid bad work and if attacked by diseases consult a doctor" (Nasreen, 2000, p. 9). Another traditional healer advised his clients to stop "illegal mixing", adopt family planning, and not reuse needles. While another said "I tell them not to urinate in the same place, not to reuse needles, to avoid sexual meeting with other villagers and bad habits"(Nasreen, 2000, p. 9).

Pharmacists also play an active role in providing reproductive health services to Bangladeshi women. Their services include providing referrals for clinical family planning methods, advice on pregnancy, and treatment and referral for STD-related symptoms (Rahman, 1999). However, most of them neither have training in basic pharmacy or in maternal and child health and family planning-related topics. In fact, in another study analyzing the role of non-formal health providers in SRH, it was found that usually the pharmacists prescribed 2 or 3 antibiotics for all STDs - They didn't know the specific antibiotics for specific STDs (Nasreen, 2000).

Most doctors are male and in the context of Bangladesh, "it is culturally prohibited for women to be seen, let alone be physically examined, by any male other than her husband" (Nasreen, 2001). Furthermore, patients do not seek any treatment because of culture of silence, shame or fear of stigmatization.

A role male doctors can play is counseling male patients about the risks of engaging in sexual behaviour with commercial sex workers. This was suggested by participants in a rural study on perceptions of STIs. The participants identified the risk groups as women in brothels and think they should receive treatment. They also felt young men should be educated as they bring diseases from outside. Educating their wives won't do much good as the men won't listen to them. Instead male doctors would be the best people to teach them, as then they would pay attention (Chowdhury & Gazi, 2003).

In Nasreen's (2000) study, it was found that Bangladeshi women seem to prefer visiting traditional healers for the reasons mentioned in section on traditional healers above. The study recommended that traditional healers may be trained in controlling STIs. This is because in this study, almost all of the different kinds health care providers interviewed were interested in becoming a sexual health educator. "If sex education is provided to me I would be interested because I do not know anything about the diseases." (Nasreen, 2000, p.10).

V. Management of RTIs/STIs in Bangladesh

Management – Programmatic Forms in Bangladesh

Dissemination of STI Knowledge

Conventional health information systems (dissemination of health messages through mass media, observance of health campaigns, use of community health educator and routine counselling services) often failed to reach the poor as these programmes are targeted to the general public (Hadi & Parveen, 2003). The author of a study of the roles of NGOs in dissemination of knowledge of sexual illnesses suggests that NGO-led health forums can be an effective media in promoting STI knowledge among women in Bangladesh (Hadi & Parveen, 2003). Also in another rural study on RTIs/STIs, the author suggests that sexual and reproductive health education should be incorporated into existing legitimate informal sex education networks rather than imposed as new, unfamiliar communication strategies. According to the preliminary research of this study, certain people have the social credibility to talk about sex in the society: These are traditional birth attendants, community health workers, pharmacists, village doctors, and traditional healers. This research further identified sisters-in-law and often grandmothers as those most likely to communicate information about sexual health to the never married and just married adolescents (Nasreen, 2001).

Internal migrants may be yet another effective way to educate the rural population: In a demonstration project to educate garment workers about HIV/AIDS via peer education, when a male peer educator was asked how they can expand the programme he stated" Garment workers come from 65 thousand villages all over Bangladesh. We are teaching them. They will teach their family when they go back to their villages. We are thus getting the opportunity to disseminate the information on the deadly disease to the people of 65 thousand villages in Bangladesh" (HASAB, 2003).

Preventive STI Services and Mass Treatment May Reduce STI Prevalence

Laboratory facilities for the etiological diagnosis of STI's and the detection of asymptomatic infections are largely nonexistent in the developing world. In populations with high STI prevalence, epidemiological treatment of the target population (also called mass treatment) should be considered an option; it has maximum sensitivity (100%) and a positive predictive value equal to the prevalence of cervical STIs (Rahman, 2004).

Incorporation of both Biomedical & Cultural aspects

In a study assessing the cultural and biomedical meanings of the complaint of leucorrhoea in South Asian women, the author states that social stressors may be one reason behind leucorrhoea. But biomedical interpretations are relevant as well. For example, women complaining of vaginal discharge may have an RTI; those with complaints of burning hands and feet may be anemic and undernourished. Thus the author suggests incorporating both biomedical and cultural aspects to treatment of vaginal discharge so that the deep psychological and / or spiritual dimensions don't go unattended. Furthermore, studies in cross-cultural psychiatry may help clarify the

associations between emotional distress (including depression) and unexplained gynaecological symptoms (Trollope-Kumar, 2001).

Multisectoral and Interdisciplinary Coordination
In rural study on RTIs/STIs, the author states that in order to achieve success in a programme managing RTIs/STIs, a good political will has to play a significant role. But in most developing countries like Bangladesh, RTIs/STIs have received low priority in national health planning and policies despite its high prevalence. In 1995, The Government of Bangladesh took a plan to regulate a national surveillance system on RTIs/STDs and HIV/AIDS, and to implement a RTI/STD/AIDS control programme as a part of reproductive health care at the various levels. The main focus of this plan was to be behaviour change communication, condom promotion, and management of RTIs/STDs. But upto the date of the study (2001), the author states that the plan had not yet been implemented and nothing has happened on the ground. The author rationalizes this failure with the fact that Bangladesh is a poor country and that it lacks appropriate resources to regulate and maintain these activities at various levels. Furthermore, there is lack of coordination among policy makers, weak programme management and structure as well as political unwillingness which inhibits the progress of policy into action. The author further claims that in Matlab, like other rural areas of Bangladesh, no programme effort has yet been taken. Thus, multisectoral and interdisciplinary coordination is needed to overcome constraints of effective RTI/STI management (Nasreen, 2001).

Diagnosis and Management

Management of Symptomatic Cases
Primary healthcare facilities in developing countries like Bangladesh face several constraints in relation to optimal management of patients with STIs. These constraints include limited access to laboratory technology necessary for aetiological diagnoses of STIs, shortage of trained staff resulting in high workloads and, therefore, limited staff time available per patient. The World Health Organization (WHO) has advocated a simpler and more cost effective method for detection and management of RTI/STI cases through a syndromic approach. This approach is to manage common RTIs using clinical flowcharts based on identifying a syndrome – a group of symptoms and signs associated with a number of well-defined aetiological pathogens that cause the symptoms reported by patients (WHO, 2002).

Advantages of syndromic management include immediate care, treatment at the first visit, and cost saving by the requiring expensive laboratory tests. Treatment at the first visit results in not losing the patient for follow-up before treatment is initiated, and also results in the reduction of further transmission and complications from untreated infections and in eliminating the need for a return visit for collecting laboratory test results. The use of flow charts in the management of RTIs/STIs standardizes diagnosis, treatment, referral and reporting (WHO, 2002).

Disadvantages of syndromic management are: (a) the costs relating to over-diagnosis and over-treatment when multiple antimicrobials are given to a patient with no or only one infection and (b) excessive use of antimicrobials which increases selective pressure for resident pathogens in the community (WHO, 2002).

The study has shown that bacterial vaginosis and candidiasis are the most common conditions or infections among women complaining of vaginal discharge. Should all women complaining of vaginal discharge then be routinely treated for these conditions or infections? In this study the flowchart without speculum examination was high enough to ensure the treatment of all infected women. Therefore in addition to the symptomatic relief, the benefit of treating such cases would reduce the risk of PID, preterm delivery, and or HIV transmission. On the contrary, the specificity of the flowchart was very poor, and therefore, this poor specificity might have resulted in over treatment. Abnormal vaginal discharge should be treated spontaneously for all vaginal pathogens, irrespective of the discharge characteristics. In addition, treatment for all women for vaginitis with a chief complaint of vaginal discharge would certainly appropriate and inexpensive at primary healthcare settings. However, possible efforts should be made to increase the specificity of the flowchart to reduce over treatment by further modifications through selecting signs and symptoms that would contribute to its specificity in addition to its high sensitivity. That is the flowchart should be able to aid in differentiating the aetiology of vaginal infections with increased specificity in addition to its high sensitivity (WHO, 2002).

Speculum Based Algorithm

A comparison of a Syndromic Algorithm (WHO recommended risk assessment algorithm based on questions of sexual behaviour to identify women with possible STI) and a speculum- based algorithm, which involved use of a speculum and pH paper for diagnosis of vaginal infections, was carried out. The WHO algorithm spent 87% of its expenditure on over treatment while the speculum-based algorithm spent 36% of its expenditure on over treatment. The WHO algorithm did not work on a population where society shuns sex outside of wedlock. Thus very few women having premarital sex and extramarital sex actually reported about such activities. Also the WHO algorithm is unable to diagnose asymptomatic women as its diagnosis is based on symptoms.

The Speculum- based algorithm is advantageous in that it proved to be a cheap & effective way for diagnosing and managing endogenous infections. It is disadvantageous because the diagnosis and management of cervical STI's by the speculum method is highly compromised due to lack of diagnostic tools and by the low specificity or absence of clinical signs. The study suggests the development of simple, cheap and effective diagnostic tests to allow correct identification of women with STI's even at the most basic health care facilities (Hawkes et al., 1999).

Management of Asymptomatic Cases

WHO has a new strategy for addressing STI in high –risk women and no longer uses symptoms as an entry point, this method has not been implemented in Bangladesh. In a study on STIs among brothel-based workers in Bangladesh, it was found a significant number of these workers to be asymptomatic (Rahman, 2005).

IV. CONCLUSION

Despite the availability of RTI/STI services as a part of the Essential Services Package of the Health & Population Sector Programme & the National Integrated Population & Health Programme, women in Bangladesh continue to suffer from reproductive tract infections and sexually transmitted infections. Social stigma towards women's reproductive health illnesses, inability to differentiate between RTIs/STIs, side effects of contraceptive methods such as IUD and tubectomy, low condom use, menstrual hygienic habits, high risk behaviour, incorrect health advice of non-formal health providers and pharmacists and inability of women who practice *purdah* to see male medical doctors and other socio-cultural factors are all deterring factors in women's health seeking patterns.

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Annexure

Table 1: Prevalence of STI Pathogens in 269 Street Based Female Sex Workers in Dhaka, Bangladesh

Pathogen, Disease, or Virus	Number of Positive Samples/number tested (%)
Cervical Pathogens	
N. gonorrhoeae	96/269 (35.6)
C. Trachomatis	61/244 (25.0)
N. gonorrhoeae or C. trachomatis	123/269 (45.7)
Vaginal Pathogen	
T. vaginalis	108/237 (45.5)
Syphilis (RPR and THPA Positive)	66/202 (32.6)
HSV-2	127/203 (62.5)

The study was conducted between May and December 1998 among street based FSW attending a rehabilitation center under a government rehabilitation programme in Dhaka Bangladesh.

Title: Etiology of Sexually Transmitted Infections among Street-Based Female Workers in Dhaka, Bangladesh

Author(s): Motiur Rahman, Ashraful Alam, Khairun Nessa, Anower Hossain, Shamsun Nahar, Dilip Datta, Shanewaz Alam Khan, Ruhul Amin Mian, M. John Albert

Source: Journal of Clinical Microbiology, Mar 2000, p. 1244-1246

Table 2: Prevalence of RTIs and STIs among 400 HBSWs with and without symptoms in Dhaka Bangladesh

Etiological diagnosis	**Number (%) of Positive Samples**
Cervical infection	
N. gonorrhoeae	143 (35.8)
C. trachomatis	174 (43.5)
N. gonorrhoeae and C. trachomatis	86 (19.4)
N. gonorrhoeae and or C. trachomatis	231 (57.8)
Vaginal infection	
Trichomonas vaginalis	17(4.3)
Bacterial vaginosis	238 (59.5)
Candidiasis	76 (19.10)
Syphillis	34 (8.5)
HSV-2	138 (34.5)
Any STI	253 (63.3)
Any RTI	275 (68.8)
Any RTI or STI	344 (86.8)

The study was conducted between April and July 2002 on the prevalence of RTIs and STIs among HBSWs working in hotels under the intervention of SRISTI (a local non governmental organization working with HBSW) in Dhaka, Bangladesh. Among 100 hotels targeted by SRISTI, 40 were selected randomly by using a computer-based randomization chart.

Title: Epidemiology and Etiology of Sexually Transmitted Infection among Hotel-Based Sex Workers in Dhaka, Bangladesh

Pam Baatsen, and Motiur Rahman

Source: Journal of Clinical Microbiology, Feb 2004, p. 618-621

Table 3: Prevalence of Reproductive Tract Infections/ Sexually Transmitted Infections Among 439 Sex Workers With and Without Symptoms in 4 brothels in Bangladesh

Etiologic Diagnosis	Number of Positive (n= 439) Number (%)	Symptomatic (n= 218) Number (%)	Asymptomatic (n= 221) Number (%)
Cervical infection			
Neisseria gonorrhoeae	77 (17.5)	35.5 (16.6)	42 (19.2)
Chlamydia trachomatis	68 (15.5)	33 (15.1)	35 (16.0)
N. gonorrhoeae and or			
C. trachomatis	120 (27.3)	57(26.1)	63 (28.5)
Vaginal Infection			
Trichomonas vaginalis	33 (7.5)	23 (10.5)	10 (4.5)
Bacterial vaginosis	211 (48.1)	114 (52.2)	97 (44.4)
Candidiasis	34 (7.7)	17 (7.7)	17 (7.7)
Syphilis (both RPR and TPHA positive)	140 (31.5)	61 (27.9)	79 (36.2)
Syphilis (RPR 1.8 and TPHA positive)	29 (6.6)	13 (5.9)	16 (7.3)
Any cervical infection (NG and CT)	120 (27.3)	57 (26.1)	63 (28.5)
Any vaginal infection (TV, BV, and xcandidiasis)	236 (53.8)	129 (59.2)	107 (48.4)
Any cervical and vaginal infection	296 (67.4)	157 (72.0)	136 (62.9)

A cross-sectional study on STU prevalence among CSWs in 4 randomly selected brothels (2 from southern Bangladesh including 1 from Jessore, 1 from Patuakhali, and 2 from Central Bangladesh in Faridpur was conducted between August 2002 and April 2003).

Title: Sexually Transmitted Infections among Brothel-Based Sex Workers in Bangladesh: High Prevalence of Asymptomatic infection

Authors: Khairun Nessa, PhD, Shama A. Waris, MBBS, Anadil Alam, MBBS, Mohsina Huq, MSc, Shamsun Nahar, MSc, Faisal Arif Hasan Chawdhury, Msc, Shirajum Monira, Msc, Monir Uddin Badal, MSc,

Jinath Sultana, Msc, Kazi Faisal Mahmud, MBBS, Joseph Das, Bsc, Dipak Kumar Mitra, MBBS, Zafar Sultan, MSc, Najmul Hossain, MBBS, and Motiur Rahman , PhD

Table 4a: Prevalence of STD in Bangladeshi Women living adjacent to a truck stand

Disease	Sample Size (N)	Positive	%	Diagnostic Test or examination
Chlamydia	384	0	0	PCR on urine
Chlamydia	261	09	3.4	PCR on swab
Gonorrhea	384	24	6.3	PCR on urine
Gonorrhea	261	14	5.4	PCR on swab
Gonorrhea	247	32		Gram Stain
Syphilis	384	22	13.0	RPR and TPHA
Herpes simplex 2	384	123	32	ELISA
Trichomoniasis	261	21	8	Wet Mount
Trichomoniasis	261	49	18.8	Culture (In pouch TV)
Trichomoniasis	261	51	19.5	Culture or wet mount

Table 4b: Prevalence of Genital Tract Infections in Bangladeshi Women living adjacent to a truck stand

Disease	Sample Size (N)	Positive	%	Diagnostic Test or examination
Bacterial vaginosis	261	59	22.6	Wet mount
Bacterial vaginosis	261	97	37.2	Gram Stain
Candidasis	261	26.1	10.0	Pelvic Examination
Vaginitis	261	108	41.4	Pelvic Examination
Cervicitis	261	44	16.9	Pelvic Examination
PID	261	15	5.7	Clinical examination

The study group comprised of 384 women aged 15-54 living in a slum encircling Tejgaon truck stand in 1998.
Title: Prevalence of infectious diseases in Bangladeshi women living adjacent to a truck stand: HIV/STD/hepatitis/ genital tract infections"
Author(s): Laura Gibney, Maurizio Macaluso, Katharine Kirk, M S Hassan, Jane Schwebke, Sten H Vermund and Parwez Choudhury
Source: Sex Transm Inf 2001; 77:344-350

Table 5: Clinical and laboratory findings among married women attending a basic healthcare clinic in Dhaka, Bangladesh

	Antenatal care (n=243)	Expanded programme on immunization (n=144)	Family Planning (n=555)	Pregnancy Interruption (n=592)	Vaginal Discharge (n=345)	Overall (n=1879)
Mean Age (years)	21.9	23	26.8	25.6	27.9	26
Polygamous marriage	2.5	5.6	9.3	10	8.6	8.3
Symptoms						
Change in vaginal discharge	25	22	31	30	75	36
Speculum examination						
Abnormal Vaginal Discharge	13	13	10	14	33	15
Cervical Mucopus	10	6	12	14	33	15
Laboratory Findings						
Cervical pathogens						
N gonorrhoae	0.8	----	0.5	0.5	0.6	0.5
C trachomatis	2.5	2.1	1.3	2.0	2.0	1.9
Any cervical pathogen	2.9	2.1	1.6	2.4	2.3	2.2
Vaginal pathogens						
T vaginalis	1.2	1.4	1.6	1.7	3.8	2.0
Candida	25	17	24	24	17	21
Bacterial Vaginosis	41	28	28	24	30	29
BVTV	41	33	29	31	32	32
Any vaginal pathogen	63	50	51	54	47	51
Antibodies to:						
T pallidum	2.1	2.8	3.4	2.7	3.2	2.9
HbcAg (Hepatitis B core antigen)	33.9	34.7	35.7	32.7	40.6	35.3
HSV-2 (herpes simplex virus type 2)	7.9	9.8	10.5	13.6	15.4	12.0

A cross sectional sample of 2335 consecutive new female clients attending a basic healthcare clinic in Mirpur, Dhaka, from July 1996 to April 1998 was included in the study. Ninety six per cent (2335/2439) of the women approached agreed to participate in the study. 28 of the women were unmarried and were excluded from the study. A total of 1879 (81.4%) of the 2307 married women were tested for all cervical and vaginal pathogens.

Twenty three percent of the married women were employed as factory workers, domestic helpers, or in other occupations versus 74% of the women in the other group. Ninety seven percent of the husbands were in formal employment. The most frequent occupations were domestic helpers, shopkeepers, factory workers, drivers and rickshaw pullers. (Continued on next page).

Title: Sexually transmitted infections among married women in Dhaka, Bangladesh: unexpected high prevalence of herpes simplex type 2 infection

Author(s): J Bogaerts, J Ahmed, N Akhter, N Begum, M Rahman, S Nahar, M Van Ranst and J Verhaegen;

Source: Sex Transm Inf 2001; 77; 114-119)

Table 6: Prevalence of Selected RTIs among pregnant women visiting an urban maternal and childcare unit in Dhaka Bangladesh

Aetiological Diagnosis	Subjects	
	Number	%
Bacterial Vaginosis	50/282	17.7
Trichomoniasis	4/282	1.4
Syphilis	8/265	3
Multiple infections	3/282	1
Any infection	59/282	23.5

A cross-sectional study was conducted during May-December 2000 among pregnant women attending an urban maternal and child care- delivery unit in Dhaka, Bangladesh, to assess the prevalence of bacterial vaginosis, *Trichomonas vaginalis*, and syphilis. All pregnant women at 16-24 weeks gestation attending the clinic for antenatal check-up irrespective of symptoms were enrolled. 280 women were enrolled in the study of whom most were married muslim and housewife. Two thirds of these women had symptoms of RTI

Title: Prevalence of Selected Reproductive Tract Infections among Pregnant Women Attending an Urban Maternal and Childcare Unit in Dhaka, Bangladesh"

Author(s): Afroza Begum, Sofia Nilufar, Khaleda Akhter, Abdur Rahman, Fatema Khatoon, and Motiur Rahman

Source: J Health Population Nutrition (2003 June); 21(2): 112-116, ICDDR,B

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