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Poverty of Opportunity for Women Selling Sex in

Lahore, Pakistan

Knowledge, Experiences & Magnitude of HIV & STIs

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*There are more things in heaven and earth, Horatio,
Than are dreamt of in your philosophy*

William Shakespeare
Hamlet Act I, scene V, 166-167

ABSTRACT

Background

According to the UNAIDS' estimates, the incidence of HIV infection has decreased by 19% over the last ten years. WHO estimated in 2005 that approximately 448 million cases of four major curable STIs occur in adults in the age group 15-49 years. Most at risk populations including women selling sex engage in behaviours that lead to HIV transmission. Health care providers are considered to play a pivotal role in the provision of preventive and curative services to individuals suffering from HIV/AIDS and STIs. The HIV epidemic in Pakistan is concentrated among injecting drug users and Hijras (transgenders).

Methods

The research involved both qualitative and quantitative research methods leading to Paper I – IV. In Paper I, individual interviews were conducted and then analyzed using the content analysis method. Respondent driven sampling was used to collect data for paper II and III, where in addition to administering a structured questionnaire, biological samples were collected to estimate the prevalence of HIV, *T. pallidum*, *N. gonorrhoeae*, *C. trachomatis* and *T. vaginalis*. Furthermore, structured questionnaire was administered to collect data for paper IV among health care providers.

Results

Limited opportunities, poverty, financial burdens, and the desire for more material assets have made girls and married women in Lahore enter and become trapped in a “web” of selling sex. Whereas 91% of women selling sex were married, 0.7% were infected with HIV, and an additional 18.5% were suffering from different curable STIs. Only 19% and 83% of the participants were aware of the terms HIV and AIDS, respectively, and only 37% had correct knowledge about transmission and prevention of AIDS. The odds of being infected with *C. trachomatis* and *N. gonorrhoeae* were 2.1 (CI 95%; 1.1-3.8) and 1.9 (CI 95%; 1.1-3.5), respectively, if women reported “not always” using condoms as compared to if they reported “always” using condoms. There were varying knowledge levels and misconceptions regarding STIs. Approximately two thirds of the women considered themselves to have had STIs in the six months preceding the survey. Women selling sex who reported consistent condom use were 1.5 times (CI 95%; 1.1-2.2) more likely to seek treatment than women who did not consistently use condoms. The treatment received did not follow any standard treatment guidelines,

influencing both effectiveness and compliance. Forty-five percent of the healthcare providers had correct knowledge about the transmission and prevention of HIV, and 82% were not aware of syndromic management of STIs. Only 10% could cite the 'correct treatment' of gonorrhoea, syphilis and vaginal discharge. The odds of having the 'correct knowledge' of diagnosing gonorrhoea and syphilis were 2.1 (CI 95%; 1.2–3.8) if the healthcare provider was a female medical doctor working in the public sector.

Conclusions

Poverty, the drive for materialism, and the desire for money are the major driving forces for resorting to selling sex, depicting a social behavioural change. HIV infection and STIs among women selling sex were relatively low in this study, which is possibly due to a high condom use, relatively low numbers of sexual partners and availability of clinical services, including syndromic management. However, there exists a high risk for a concentrated HIV epidemic among women selling sex due to their low level of knowledge about HIV, attitudes, risk behaviour and sexual practices. The level of knowledge about STIs remains low among women selling sex in Lahore, Pakistan. Furthermore, health-seeking behaviour for STI treatment is influenced by ability to pay and ease of access, as well as availability in the private sector. Even though health care providers in Lahore were providing health care for both HIV/AIDS and STI patients, the low levels of knowledge and practices and poor attitudes regarding the management of HIV infection and STIs emphasize that further intensive training is needed to improve their ability to correctly diagnose and subsequently treat patients infected by STIs.

Keywords: Human Immunodeficiency Virus, Acquired Immune Deficiency Syndrome, Sexually Transmitted Infections, Respondent Driven Sampling, People Living with HIV, Women Selling Sex, Poverty of Opportunity.

List of Publications

- I. MS Khan, E Johansson, S Zaman, F Jalil, Naveed-i-Rahat, M Unemo, C Stålsby Lundborg. Poverty of Opportunity forcing women into prostitution - a qualitative study in Pakistan. *Health Care for Women International*. 2010;31(4):365-83.
- II. MS Khan, S Zaman, M Unemo, C Stålsby Lundborg. HIV and STI prevalence and risk behaviours among women selling sex in Lahore, Pakistan. *BMC Infectious Diseases* 2011;11:119
- III. MS Khan, S Zaman, M Unemo, C Stålsby Lundborg. Health seeking behaviour of women selling sex in Lahore, Pakistan. *International Journal of STD & AIDS* (Accepted – February 2011).
- IV. MS Khan, S Zaman, M Unemo, C Stålsby Lundborg. Knowledge, attitudes and practices regarding human immunodeficiency virus and acquired immune deficiency syndrome and sexually transmitted infections among health care providers in Lahore, Pakistan. *Journal of Ayub Medical College Abbottabad* 2009;21(4).

The papers are referred to in the text by their Roman numerals I-IV.

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List of abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ARV	Antiretroviral
ATCC	American type culture collection
BCC	Behaviour Change Communication
CT	<i>Chlamydia trachomatis</i>
DIPI	Domestic Investment Poverty Index
EIA	Enzyme Immunoassay
FGD	Focus group discussion
GC	Gonococcal
GDP	Gross domestic product
GHF	Global health financing
GHI	Global health initiatives
GSM	Greenstar Social Marketing
HCDS	Health care delivery system
HCPs	Health care providers
HIV	Human Immunodeficiency Virus
IBBS	Integrated Biological and Behavioural Surveillance
IDUs	Injecting Drug Users
KAP	Knowledge, attitude, practices
LHV	Lady Health Visitor
LICs	Low income countries
MARPs	Most at risk populations
MDGs	Millennium Development Goals
MENA	Middle East and Northern Africa
MSM	Men who have sex with men
MTDF	Medium Term Development Framework
NAAT	Nucleic acid amplification testing
NACP	National AIDS Control Program
NG	<i>Neisseria gonorrhoeae</i>
NGOs	Non governmental organizations
NSF	National Strategic Framework
PCR	Polymerase Chain Reaction
PDHS	Pakistan Demographic and Household Survey
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	People living with HIV
PPV	Positive predictive value
PRSP	Poverty Reduction Strategy Paper
RDS	Respondent driven sampling
RPR	Rapid Plasma Reagin
RTIs	Reproductive Tract Infections
SDH	Social determinants of health
STD	Sexually transmitted disease
STIs	Sexually Transmitted Infections
TPPA	<i>Treponema pallidum</i> passive particle agglutination
UNAIDS	Joint United Nations Programme on HIV/AIDS
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organization

Preface

All my life I have been travelling, both domestically and internationally. By the time I finished my tenth year of schooling, I realized that it was my seventh school as my father was serving in Pakistan Air Force and we were moving due to his transfers. This exposed me to different cultures, various languages and diverse value systems. Learning human behaviour by observation became a part of my life. When I came to my medical school, my teachers, especially in first two years, made it a point to kick me out of the class as to every new thing I learned, I asked the question “WHY”.

After my graduation from medical school, I had the first exposure of nepotism and learnt that human resource policies were only focused on development and never took into account human resource planning and management. For reasons beyond my control, I ended up working for the National AIDS Control Program. This was my first exposure to what we now call the most at risk populations. One of my assignments was very interesting and challenging. Like an undercover agent, I was assigned to talk and break into the network of women selling sex. My first encounter was with “Madam X”, who was famous for her links with the politicians in our legislative assembly in Islamabad. The only encounter that I had then was “as a client” and trying to understand if they were using any preventive measures for HIV. At the end of the meeting, I got some kind of an answer but was taken aback when I realized that the women I was interviewing wanted me as a client more than what I wanted to discuss. However, during the two years with the National AIDS Control Programme, I interacted with women and men selling and buying sex and also with Hijras (transgenders). With this background I left to work for a public health school from where I went on to complete my Masters in Public Health. My thesis, against all odds, was among Hijras and the focus was HIV. My desire to observe human behaviour and the question “WHY” things happen and then “HOW” joined the discussion. Did human behaviour work in isolation and why was it that things were happening in different ways? Then came in “WHAT” initiates behaviours and “WHERE” does it take place. What really questioned me all this time was not “WHO” was doing this all but “WHO” was making them do it all?

This research is part of my dream to put together this jigsaw of human behaviour and practices among people whom we don't like to sit with, don't invite to dinners, don't interact with socially, don't support to have better choices, don't listen to, don't prefer to live with and never make the decision to embrace them in our lives – for we have put a mental block and never think out of our comfort level. For us, talking about sex and sexuality is a taboo, yet we practice it.

I am lucky to have a partner who supported me and supervisors who believed in my dream. This dream brought me to IHCAR, Karolinska Institutet to paint this canvas. The dream has not ended. It has taken me one step up to serve better and reason with behaviours and practices.

Then, when it came to writing my thesis, I thought of some principles for writing. The first one says: if you can say something using 100 words, why cut it to 10 words? The second one says: if you can say something in 10 words, why not use 100 words? The third principle says: why include an executive summary? And then I said to myself, “and why not! Let them read the whole thing”.

The thesis is about “Poverty of Opportunity”, which is centred on gender power relationships, where deterrents for accessing basic services like health and education can lead to disempowerment and inability to make informed decisions.

1. Background

1.1 Global HIV epidemic

Human immunodeficiency virus (HIV) remains a global health problem of extraordinary magnitude and scope. Almost unknown 30 years ago, HIV is so far responsible for more than 25 million deaths worldwide and for extensive demographic changes in the most heavily affected countries (1). According to the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates, there was a 27% increase in the number of people living with HIV (PLHIV) over a ten years period from 1999 to 2009. However, the fourth decade of the HIV epidemic has witnessed a 19% reduction in new HIV infections over the same period and a 21% reduction since 1997, which was the year in which annual new infections peaked (1). The HIV incidence in 33 countries has fallen by more than 25% between 2001 and 2009. The number of annual acquired immune deficiency syndrome (AIDS) related deaths worldwide is steadily decreasing from the peak in 2004 (1), which is indicative of increased availability of antiretroviral therapy, care and support, to PLHIV and also the decreasing incidence starting in the late 1990s (2). Details are given in Table 1.

Table 1. Status of Global HIV infections over 10 years – 1999 – 2009

	Number of people living with HIV (millions)	Number of new HIV infections (millions)	Number of AIDS related deaths (millions)
1997		3.2 (3.0– 3.5)	
1999	26.2 (24.6 – 27.8)	3.1 (2.9 – 3.4)	
2004			2.1 (1.9–2.3)
2009	33.3 (31.4 – 35.3)	2.6 (2.3– 2.8)	1.8 (1.6–2.1)

However, the HIV epidemic has affected different regions in different ways. Details of regional HIV statistics are given in Table 2.

Table 2. Regional HIV Statistics – Global Report 2010

Region	Adults and children living with HIV in 2009	Adults and Children newly infected with HIV in 2009	Adult prevalence (15-49 years) %
Sub-Saharan Africa	22.5 million (20.9 million – 24.2 million)	1.8 million (1.6 million – 2.0 million)	5.0 (4.7 - 5.2)
South and South East-Asia	4.1 million (3.7 million – 4.6 million)	270,000 (240,000 – 320,000)	0.3 (0.3 - 0.3)
East Asia	770,000 (560,000 – 1.0 million)	82,000 (48,000 – 140,000)	0.1 (0.1 - 0.1)
Eastern Europe and Central Asia	1.4 million (1.3 million – 1.6 million)	130,000 (110,000 – 160,000)	0.8 (0.7 - 0.9)
Caribbean	240,000 (220,000 – 270,000)	17,000 (13,000 – 21,000)	1.0 (0.9 - 1.1)
Central and South America	1.4 million (1.2 million – 1.6 million)	92,000 (70,000 – 120,000)	0.5 (0.4 - 0.6)
North America	1.5 million (1.2 million – 2.0 million)	70,000 (44,000 – 130,000)	0.5 (0.4 - 0.7)
Western and Central Europe	820,000 (720,000 – 910,000)	31,000 (23,000 – 40,000)	0.2 (0.2 - 0.2)
Middle East and Northern Africa	460,000 (400,000 – 530,000)	75,000 (61,000 – 92,000)	0.2 (0.2 - 0.3)
Oceania	57,000 (50,000 – 64,000)	4,500 (3,400 – 6,000)	0.3 (0.2 - 0.3)
TOTAL	33.3 million (31.4 million – 35.3 million)	2.6 million (2.3 million – 2.8 million)	0.8 (0.7 - 0.8)

Sub-Saharan Africa bears an excessive burden of the global HIV infection (3). In sub-Saharan Africa, an estimated 1.8 million (1.6 million – 2.0 million) people became infected in 2009, lower than the estimated 2.2 million (1.9 million – 2.4 million) people in 2001. Between 2001 and 2009, the incidence of HIV infection declined by more than 25% in 22 countries. In 2009, 10 countries in southern Africa accounted for 34% of all PLHIV in the world and 31% of all new HIV infections globally in the same year occurred in these ten countries, as well as 34% of all AIDS-

related deaths (1). The HIV epidemic is primarily characterized by heterosexual and bisexual practices. The prevalence of discordant couples in a long-term relationship is high, which also tends to increase HIV transmission. This prevalence of discordant couples ranges between 36% and 85% among people living in 12 countries of eastern and southern Africa (4). In Zambia, 60% of newly infected PLHIV were infected within marriage or cohabitation (5), as compared to estimates of 50% to 65% in Swaziland, 35% to 62% in Lesotho and 44% in Kenya. Unprotected paid sex, men who have sex with men (MSM), use of contaminated injecting material, and MSM having sex with their female partners are major triggers in several African countries. These have been attributed to 33% of new HIV infections in Kenya and 40% in Ghana (5). Paid sex work has contributed to 32% new infections in Ghana, 14% in Kenya and 10% in Uganda. MSM also have high levels of HIV infections in sub-Saharan Africa (6). These have contributed to 20% new infections in Senegal (7), 15% each in Kenya and Rwanda (5). As with elsewhere in the world, MSMs in sub-Saharan Africa also tend to have sex with women. In Senegal and Malawi, 82% and 33% of the surveyed MSM claimed to be cohabiting with women (8).

Asia, which is home to 60% of the world's population, stands second only to sub-Saharan Africa numerically with respect to hosting PLHIV. Asia's epidemic is believed to be largely stable, however it remains concentrated among injecting drug users (IDUs), sex workers and their clients, and MSMs. In 2009, an estimated 4.9 million (4.5 million – 5.5 million) people were living with HIV, which was almost the same as five years ago. It is imperative to note that none of the Asian countries has a generalized epidemic. During the late 1990s in Thailand up to 60,000 people were becoming newly infected annually, whereas the number of new HIV infections receded to approximately 350,000 by 2008 (9). The adult HIV prevalence in Cambodia decreased to 0.5% (0.4 – 0.8%) in 2009 as compared with 1.2% (0.8 – 1.6%) in 2001. However, the HIV prevalence is increasing primarily due to injecting drug use in countries including Bangladesh, Pakistan and Philippines (1). There has not been a consistent decline in the HIV incidence in Asia. The incidence fell by more than 25% in India, Nepal, and Thailand between 2001 and 2009. However, the incidence has increased by 25% in Bangladesh and Philippines between 2001 and 2009, even though the countries experienced relatively low levels of HIV epidemic (1).

The Asian HIV epidemic is peculiar as it starts with the IDUs before being passed on to other most at risk populations, including MSMs and women selling sex (10). The IDUs have also been reported to buy and sell sex, thereby increasing the risk of acquisition and transmission of HIV infection to other most at risk populations (MARPs) (11, 12). Among the women selling sex during the mid-2000s, about 18% in Myanmar, and 15% in southern India tested positive for HIV (13). However, evidence from Karnataka in India has shown that an intensive HIV prevention effort among women selling sex has almost halved the HIV prevalence from 1.4% to 0.8% (14). The Asian epidemic is also compounded by a high HIV prevalence among

MSM in several countries: 6% in the Laotian capital of Vientiane (15), 17% to 31% prevalence in Bangkok (16), and between 7% and 18% in parts of southern India (17). Furthermore, there is evidence of rising HIV prevalence in China among MSM (18, 19). The Asian HIV epidemic is also compounded by bisexual behaviours among men, which suggest that a significant proportion of MSMs also have sex with women (15).

The number of PLHIV in **Eastern Europe and Central Asia** has almost tripled since 2000 and reached an estimated total of 1.4 million [1.3 million–1.6 million] in 2009 compared with 760,000 [670,000 – 890,000] in 2001 (1). Two countries, the Russian Federation and Ukraine, together account for 90% of all newly reported HIV diagnoses in this region, and have an overall prevalence of 1% or higher (20). Annual HIV diagnoses in Ukraine have more than doubled since 2001. The HIV epidemic in the Russian Federation also continues to grow, but at a slower pace than in the late 1990s.

The HIV epidemic in Eastern Europe and Central Asia is concentrated among IDUs, sex workers, their sexual partners and, to a lesser extent, among MSM. An estimated one quarter of the 3.7 million people (most of whom are men) who inject drugs in the region are living with HIV (21). In the Russian Federation, more than one third (37%) of the country's estimated 1.8 million people who inject drugs are believed to be living with HIV (21), compared with between 39% and 50% in Ukraine (20).

The HIV prevalence among adults in the **Caribbean** is about 1.0% [0.9%–1.1%], which is higher than in all other regions except sub-Saharan Africa. During 2009, approximately 240,000 [220,000–270,000] PLHIV were estimated in the Caribbean. During 2009, an estimated 17,000 [13,000–21,000] people became newly infected with HIV, which is about 3000 less PLHIV as compared with the 20,000 [17,000 – 23,000] new infections in 2001. Unprotected sex between men and women—especially paid sex is believed to be the main mode of HIV transmission in this region (22).

In **South and Central America**, the estimated number of PLHIV increased to 1.4 million [1.2 million – 1.6 million] in 2009 as compared with 1.1 million [1.0 million – 1.3 million] in 2001. The HIV epidemic in this region is concentrated around MSM, where the prevalence has been found to be at least 10% in 12 of 14 countries (23).

In **North America, Western and Central Europe**, the number of PLHIV has increased by 30% to an estimated number of 2.3 million [2 million – 2.7 million]. In this region unprotected sex between MSM continues to challenge interventions based on prevention. Available information suggests a re-emerging HIV epidemic among MSMs in this region (24, 25). Among the IDUs, the rates of new infection have declined due to harm reduction services (26, 27).

In the **Middle East and Northern Africa (MENA)**, HIV prevalence and new HIV infections continue to increase. It is estimated that 460,000 [400,000 – 500,000]

PLHIV were in MENA during 2009 as compared to 180,000 [150,000 – 200,000] in 2001. There appears to be a paucity of data to indicate trends in HIV infection prevalence. In Iran, an estimated number of 14% IDUs were living with HIV (28). Research on MSM indicates that 9% MSM in Sudan and 6% MSM in Egypt were infected with HIV (29, 30).

In the **Oceania** region, the HIV epidemic has doubled between 2001 and 2009, from 28,000 [23,000 – 35,000] to 57,000 [50,000 – 64,000]. The HIV epidemic in Oceania is driven by sexual transmission, both heterosexual and unprotected sex among MSM (31).

1.2 Sexually Transmitted Infections

Sexually transmitted infections (STIs) are transmitted from person-to-person through sexual contact. Over 30 different infecting agents consisting of bacteria, viruses and other microorganisms can be transmitted through sexual activity. The infections can be asymptomatic, hard to treat, cause severe long-term consequences, or even be fatal as with AIDS. STIs can cause genital ulcers, infertility, ectopic pregnancy, spontaneous abortion, premature delivery, neonatal blindness and neonatal infection (32). In LICs, STIs and their complications rank in the top five disease categories for which adults seek health care. In women of childbearing age, STIs, even excluding HIV are second only to maternal factors as causes of disease death and health life lost. The failure to diagnose and treat STIs at an early stage can contribute substantially to both individual and national expenditure (33). In addition, the scale of the STI problem is too great to be dealt with in specialized STD centres alone (34).

The appearance of HIV and AIDS has focused greater attention on the control of STIs. There is a strong correlation between the spread of STIs and HIV transmission, and both ulcerative and non-ulcerative STIs have been found to increase the risk of sexual transmission of HIV infection (35-39). The interlinking between HIV and STIs and burden of disease require responses to be based on multidisciplinary, cross cultural analysis, research, interventions and policy making, which must include not only epidemiological and biomedical disciplines (2). The emergence and spread of HIV infection and AIDS have also complicated the management and control of some other STIs. Furthermore, antimicrobial resistance of *Neisseria gonorrhoeae* is increasing, rendering some regimens ineffective. New agents, such as third-generation cephalosporins, capable of treating resistant *N. gonorrhoeae* strains, are available but remain expensive (40-42). However, their initial high price must be weighed against the costs of inadequate therapy, including complications, relapse and further transmission of infection.

The etiological diagnosis of STIs places constraints on time and resources to both the client and the health system, thus increasing costs and reducing access to treatment. In addition, provision of trained laboratory staff along with sensitivity and specificity of commercially available tests affect the reliability of laboratory testing for STI diagnosis. The World Health Organization (WHO) therefore initiated the syndromic

management of sexually transmitted infections in 1991. The syndromic management approach is based on the identification of consistent groups of symptoms and easily recognized signs (syndromes), and the provision of treatment that will deal with the majority of, or the most serious, organisms responsible for producing the syndrome (33). Thus the syndromic management of STIs and reproductive tract infections (RTIs) was initiated as:

- ☛ Testing was often not available in low resource settings, so diagnosis was to be made based on symptoms and signs;
- ☛ Some infections were impossible to differentiate, even by highly trained providers, based on their signs and symptoms; and
- ☛ Clients who sought treatment from multiple providers may present with symptoms altered by previous treatments.

However, several shortcomings have been recorded in the syndromic management algorithms. Studies conducted from initial period of administration of the syndromic management of STIs until now have pointed out varying levels of sensitivity, specificity and low positive predictive value (PPV) of the algorithms, leading to over-prescription of antibiotics, while taking laboratory diagnosis as the gold standard, and eventually contributing to antibiotic resistance (33). Mayaud et al in 1994 evaluated the performance of the WHO algorithm, which revealed a PPV of 9.8 percent in the detection of *N. gonorrhoeae* and *Chlamydia trachomatis* cervical infections in Tanzania (43). Similar results were seen in studies conducted in India (44-46), Bangladesh (47) and Jamaica (48), with PPV ranging from 11.5 percent to 24.6 percent for different STIs.

The World Health Organization (WHO) estimated in 2005 that approximately 448 million cases of four major curable STIs occur in adults in the age group 15-49 years. Among these were 11 million cases of *Treponema pallidum*, 88 million cases of *N. gonorrhoeae*, 101 million cases of *C. trachomatis* and 249 million cases of *Trichomonas vaginalis* (49). The morbidity and mortality associated with STIs are complex and multiple, since they also facilitate the sexual transmission of HIV (37, 39, 50). Globally, HIV contributes to 58.5 million Disability Adjusted Life Years (DALYs), equating to 3.8% of all DALYs, and thus ranks fifth in terms of size of all DALY contributions. The burden of disease of HIV/AIDS and STIs is large and it disproportionately affects LICs (51, 52) and is presented in Table 3. Furthermore, the details of the four STIs under study is given in table 4 (53).

Table 3. Burden of HIV/AIDS and STIs in DALYS by age group and countries grouped by income per capita

	High income			Middle income			Low income		
	Total	Age groups		Total	Age groups		Total	Age groups	
	Total	0-14	15-59	Total	0-14	15-59	Total	0-14	15-59
Population (Millions)	977	179	607	3045	773	1958	2413	894	1366
Total DALYs	122092	9942	69287	572859	128397	335905	827669	409816	346862
STIs excluding HIV	215	8	205	2,327	319	1970	7,877	2986	4698
Syphilis	7	3	4	301	158	126	2535	2046	340
Chlamydia	159	3	156	1169	22	1144	2419	57	2351
Gonorrhoea	46	2	44	799	136	661	2703	852	1851
HIV/AIDS	/ 628	4	608	14977	1809	13045	42867	8695	33826

Table 4: Overview of *T. pallidum*, *N. gonorrhoeae*, *C. trachomatis* and *T.vaginalis*

Type of pathogen	Clinical manifestation	Diagnosis	Treatment among adults
<i>T. pallidum</i> Spirochaete bacterium	Painless ulcers on genital, perineal, or anal area of 1-2 cm with bilateral enlargement of inguinal lymph nodes. If untreated, the infection manifests with low-grade fever, malaise, sore throat, headache, adenopathy, cutaneous or mucosal rash, neurological manifestations, and cardiac lesions.	Nontreponemal tests (e.g., Venereal Disease Research Laboratory [VDRL] and Rapid Plasma Reagin) and Treponemal tests (e.g., fluorescent treponemal antibody absorbed [FTA-ABS] tests, the T. pallidum passive particle agglutination [TP-PA] assay, various Enzyme Immunoassays and chemiluminescence immunoassays).	Benzathine penicillin G 2.4 million units IM in a single dose
<i>N. gonorrhoeae</i> Gram-negative bacteria	Among men, it mostly manifests as urethritis with scanty, clear, cloudy or purulent discharge and burning on micturation. Among women, approximately 50% of the cervical infection is asymptomatic. The most common symptoms include vaginal discharge, abnormal vaginal bleeding, and occasionally dysuria.	Gram stain (Sensitivity < 95%; specificity > 99%); Culture; Nucleic acid amplification testing (NAAT)	Ceftriaxone 250 mg IM in a single dose or Cefixime 400 mg orally in a single dose or Single-dose injectable cephalosporin regimens plus Azithromycin 1g orally in a single dose or Doxycycline 100 mg a day for 7 days
<i>C. trachomatis</i> Gram negative bacteria	Among men, the symptoms include urethral discharge and or dysuria. Among women, the symptoms include vaginal discharge, dysuria, intermenstrual bleeding, or bleeding after sexual intercourse.	Nucleic acid amplification testing; Cell culture; Direct immunofluorescence; and Nucleic acid hybridization tests	Azithromycin 1 g orally in a single dose or Doxycycline 100 mg orally twice a day for 7 days
<i>T.vaginalis</i> Protozoan	Men may present without any symptoms or those of non-gonococcal urethritis. Women present with diffuse, malodorous, yellow-green vaginal discharge with vulvar irritation.	OSOM Trichomonas Rapid Test (Genzyme Diagnostics, Cambridge, Massachusetts), an immunochromatographic capillary flow dipstick technology, and the Affirm VP III (Becton Dickenson, San Jose, California), a nucleic acid probe test	Metronidazole 2 g orally in a single dose or Tinidazole 2 g orally in a single dose

1.3 Reaching Most at Risk Populations

The WHO defines MARPs as the groups of people who more frequently engage in behaviours that lead to HIV transmission. These behaviours include unprotected sex, sex with multiple partners, and the use or reuse of contaminated skin piercing or injecting equipment. Such populations include MSMs, women selling sex and their clients, and IDUs. The stigma attached with behaviours and practices of MARPs has limited their access to health services (54). In order to understand the social context and personal views, qualitative research methods have been used in public health to describe social phenomena and behaviours (55).

HIV surveillance aims to provide knowledge of epidemics, including the source of new infections over time and also the behavioural and biological determinants driving the epidemic in order to provide a basis for evaluating and redesigning appropriate interventions and strategies (56). For an effective surveillance system, it is crucial that surveillance efforts focus on the specific populations that play a vital role in HIV transmission. Identification of sub-populations should aim to provide information about the dynamics of HIV infection, i.e., among whom, where and how, along with understanding of key risky behaviours attached with HIV infection (57, 58). It is imperative for surveillance to focus on sub-populations that are large enough in number to influence the spread of HIV. In countries where the epidemic is either of a lesser scale or in a stage of concentrated epidemic, these sub-groups of the society generally consist of women selling sex, IDUs, and MSM. However, the major challenge for surveillance is obtaining a 'representative' sample of MARPs for research purposes (59). The critical challenge remains that these MARPs are hidden and there exists no sampling frame for them. This is primarily because their behaviours are considered illegal and unacceptable (60, 61).

For research on MARPs, it is imperative to derive a representative sample not only to determine the biological markers but also to understand the associated social behaviours. This is termed as the second-generation surveillance of HIV or integrated biological and behavioural surveillance (IBBS). The IBBS collects and compares

biological samples including those for HIV prevalence and risky behaviours that are considered to be the determinants for spreading HIV. The IBBS builds upon an informative database of changes in the epidemic over a period of time. The HIV epidemic can have three different states (62) which are presented in Box 1.

Box 1. Three States of HIV Epidemic

- a. **Low – level:** The recorded HIV infection has consistently not exceeded more than five percent in any MARP; the HIV infection is confined to MARPs or has been introduced recently;
- b. **Concentrated:** HIV prevalence is consistently over five percent in one or several MARPs but has not established in the general population. The future course of the HIV epidemic is then determined by linkages and networking with either MARPs among themselves or through the bridging populations; and
- c. **Generalized:** HIV prevalence is consistently over one percent among pregnant women. Sexual networking among general population is then sufficient to sustain an HIV epidemic, and remains independent of MARPs.

Reaching the MARPs has remained a challenge to obtain a representative sample to determine the magnitude of the epidemic. The challenge arises as these populations are hidden, that they engage in behaviours which are often termed illegal, and also that they generally prefer not be part of the surveillance data collection activities (61). It has been shown that methods including snowball sampling, target sampling, facility based sampling and time and location sampling are limited by sampling bias, time and resource requirements, and hence have not been able to generate valid information to survey MARPs (63).

Another sampling method is called Respondent Driven Sampling (RDS) (64). It involves chain referral sampling in a manner that allows itself to be qualified as a probability sampling method. RDS has also been documented to have greater external validity for MARPs as compared to other sampling methods, as it accesses respondents through their social networks (65, 66). Among the primary features that distinguish RDS is the limited number of participants each recruiter can bring into the research. This minimizes the influence of initial so called “seeds” on the final sample composition and hence encourages long recruitment chains. Furthermore, the data collection takes place through waves until equilibrium is reached. Equilibrium can be said to occur when estimates converge around a sample that does not change during further waves of recruitment. This equilibrium is reached within 6 or less waves, irrespective of who the first recruiter was. Another advantage is that RDS is based on a dual incentive system both for participating and for recruiting further participants (63).

1.4 The context of selling sex

"To prostitute" is derived from a composition of two Latin words: (preposition) *pro* and *statuere*. A literal translation therefore would be: "to expose", "to place up front". The

English word *whore* derives from the old English word *hōra*, from the Indo-European root *kā* meaning "desire" (67). The word "prostitute", or more frequently "whore", is also used as an insult towards a person (typically a woman or girl) who is perceived as being sexually promiscuous (67). Correctly or not, *prostitute* without specifying a gender is commonly assumed to be female; compound terms such as male prostitution or *male escort* are therefore used to identify males. Those offering services to female customers are commonly known as *gigolos*; those offering services to male customers are *hustlers* or *rent boys*. In this thesis, the word "*prostitute*" has been omitted as its translation in Urdu - the national language of Pakistan - is an abuse for women. Likewise, the term female sex worker or FSW has been replaced with women selling sex, in order to minimize the stigma attached.

Males as clients of women selling sex have been cited to be a "bridge" for transmission of HIV and STIs from high to low prevalence populations. This is seen in a risk environment, which in turn is embedded in its context, interplay between beliefs, practices, social norms, economics and policies (68).

1.5 Concurrent Partnership

The concept of concurrent partners has received increasing attention (69). It has been argued that concurrent partnerships in conjunction with high viral load during acute HIV infection and the low level of male circumcision have contributed to the rapid spread and the high prevalence levels of HIV in southern Africa (70). The epidemiological and mathematical modelling studies have investigated the prevalence of concurrency and its effect on the transmission of HIV and other STIs. Early modelling work concluded that, for the same number of partners per person, sexual partner networks that include concurrent partnerships lead to larger HIV epidemics than do networks without concurrent partnerships (71). While researchers and prevention programme experts agree that having multiple sexual partners is an important risk factor in the transmission of HIV (72-76), the comparative impact of concurrent multiple relationships as opposed to serial multiple relationships in the spread of HIV is less clear. For example, a study in five cities in sub-Saharan Africa found no association between concurrency and HIV prevalence level (77), and a small study in Malawi also found no association between the density of sexual networks and HIV prevalence (78).

Multiple concurrent partnerships are often linked to mobility (including labor-related mobility), in that people may have different partners at their different residences; also, those staying behind may themselves have other partners (79, 80). Most authors define concurrency as "sexual relationships that overlap in time" (77, 78, 81-84). However, others have considered multiple partnerships in a short time period to be a proxy measure of concurrency (70). Important issues for the epidemiological assessment of concurrent partnerships include the length of overlap of sexual relationships, how the number of partners is categorized (more than one, more than five, for example), and the length of the period during which concurrency is assessed (the last month, last six

months, last year). Also important for measurement in surveys are a host of behavioural and social factors, ranging from local terminology to factors influencing recall and reporting bias for different types of sexual contacts. Understanding sexual networks is crucial to understanding the HIV epidemic.

Considerable work is needed to refine methods for measuring and comparing sexual norms, behaviours and networks in diverse cultural contexts and risk settings worldwide. Standard definitions and further collection and analysis of primary behavioural, network and context data are needed to understand and quantify the relationship between concurrency and the spread of HIV (85-88).

1.6 Health Systems

A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health (85). The WHO has described six principles to provide guidelines to the health system of any country that needs to expand the range of services, extend access and provide social protection to its people to sustain the financial and social consequences of seeking health care (86). These principles are presented in Box 2.

Box 2. WHO's six principles to guide health systems

- (i) Service delivery;
- (ii) Health workforce;
- (iii) Information;
- (iv) Medical products/vaccines/technologies;
- (v) Financing; and
- (vi) Leadership/governance.

Health systems evolve over time by responding to factors such as changing epidemiological situations, enhanced demand of the clients, challenges related to equity and aiming to provide universal access with safe new technologies (87). Global health financing (GHF) has increased over the last decade through global health initiatives (GHI) (88) and has emerged as a mechanism for development assistance for health in low-income countries (86). The distribution of resources through GHIs has been analyzed and demonstrated to have a significant effect on health and gender equity (89). However, whereas GHIs have successfully trained and retrained health workers, evidence suggest that GHIs have actively depleted the health care staff from the public sector to work for private sector or non-governmental organizations (NGOs) implementing partners (90).

Health systems in LICs work around policies, which are driven by the intents of policy makers and less on the issue network of the direct and indirect beneficiaries. The

public sector or state in LICs assumes the role of both provider and the purchaser of health services, its regulation, research, training and competition with the private sector, which it aims to regulate as well. Due to such complexities, the public sector faces information asymmetry concerns, health interests of both professionals and pharmaceutical industry, patronizing political systems and reliance on external donor funding. Furthermore, health systems are influenced by globalization due to lesser geographical distances between regions, rapid spread of ideas and innovations and growing partnerships between public and private sector (91).

Health planners in LICs are also facing a daunting challenge of addressing the social determinants of health (SDH) due to limited understanding and drive to address complex and intractable issues (92). Health systems research is a public good with the prospective intent to review performance and provide guidance for future investment (93). International collaboration for health system development has been identified as a collaborative effort to strengthen capacity rapidly and efficiently across low income countries (94).

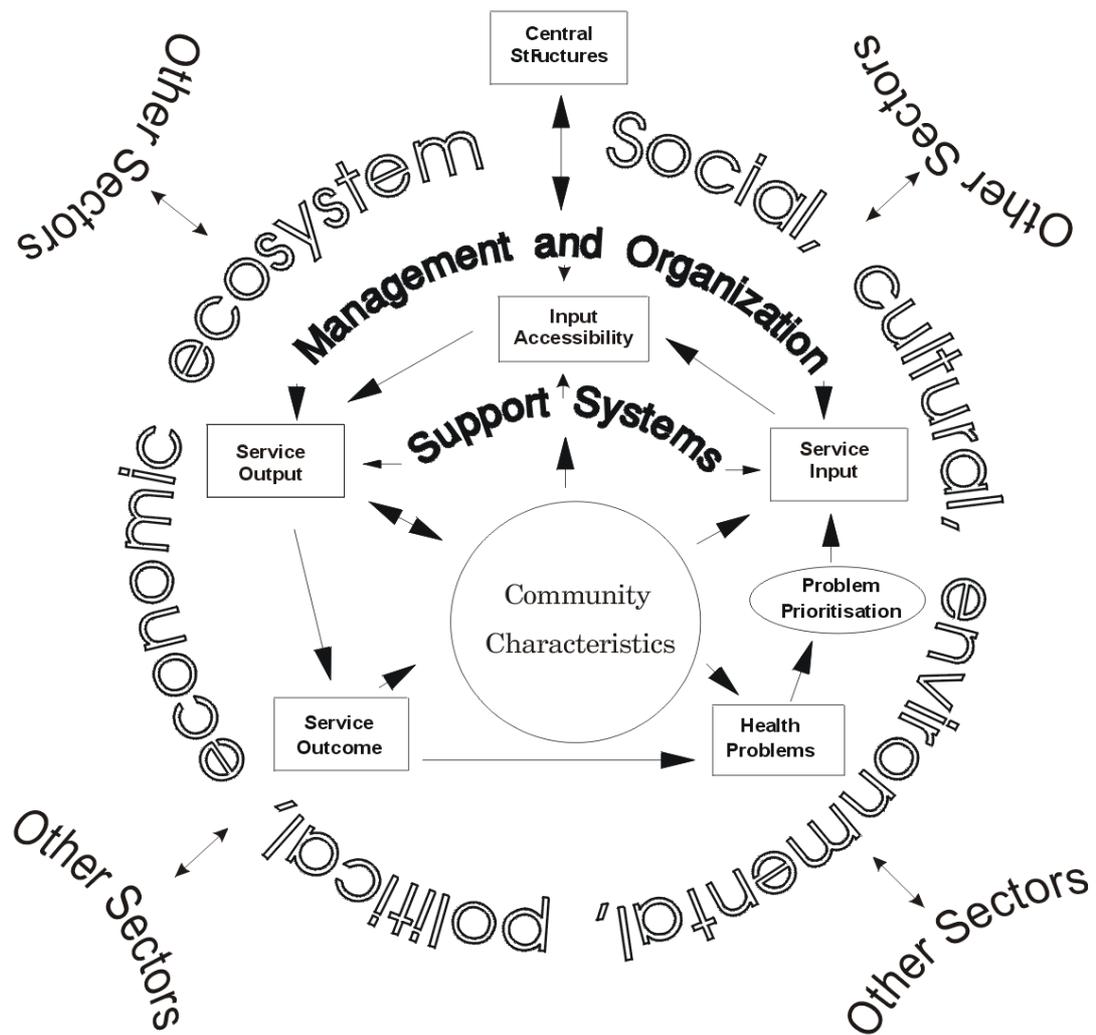
The Health System is a complex arrangement and several models have been developed to illustrate its various components, functions, goals, and objectives, with each model demonstrating different aspects of the system. To illustrate the validity of different models, two models are mentioned. The first was proposed by the World Health Organization, and is the theme of the millennium World Health Report 2000 on “Health System: Improving Performance” (85). This model provides a comprehensive macro-policy framework for evaluation and comparison of overall functions and objectives. This model relates primarily to functions and responsibilities performed at central levels, such as policy formulation, ensuring equity of care, satisfying people’s non-medical expectations (e.g., preventing poverty resulting from illness and poor health), as illustrated in Box 3.

Box 3. Objectives of Health System	
<i>Improve Health Status</i>	<ul style="list-style-type: none"> • Improve overall health status of the population • Reduce morbidity, mortality and disability
<i>Fair Financing</i>	<ul style="list-style-type: none"> • Financial protection from the cost of ill health
<i>Responsiveness to clients</i>	<ul style="list-style-type: none"> • Dignity, confidentiality, autonomy of clients • Prompt attention, quality of amenities, access to social support networks and choice of provider

The second model is based on the **System Approach**, and was developed by Kielmann (95). The System Approach provides an effective analytical framework for the examination, diagnosis and solution of problems of any complex system, including the

health system. This model readily permits the following six essential elements: a) identification of the problem; b) definition of objectives; c) examination of alternatives; d) evaluation and selecting solutions; e) integration of solutions and implementation; and f) the use of feedback throughout the process (95). The model is illustrated below and is briefly described in Box 4.

The Health System Model



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Box 4. Brief description of Kielmann's Health System Analytical Model

Community Characteristics The communities' demographic, social and behavioural characteristics very much influence their health status as well as their participation with the health services delivery system.

Health Problems and Needs form the basis of any health care delivery system. Health problems are objectively verifiable conditions that reduce the quality, productivity or length of life. Health needs are verbalized and prioritized by health professionals and the community and are termed as normative and felt needs respectively.

Service Inputs are the individual program components of the health care delivery system, the infrastructure required to run the services and service programs, and the service delivery structure that is the way the services are set up.

Service Distribution refers both to accessibility of essential services, i.e. from geographic, economic and social points of view, and their availability, in terms of function, minimally required infrastructure and resources.

Service Output refers to the number, frequency and quality of activities necessary to implement a given service program (service or administrative).

Service Outcomes, hence designate intermediate results short of reaching the main, or principal objective.

Impact is indicative of the change in the health status that has been brought about by health services in general or a specific intervention, in particular.

Management & Organization is responsible for ensuring integrity and functionality of the entire system complex. Service inputs, its support systems, input distribution & accessibility, and service outputs together with health service management and organization make up the Health Care Delivery System (HCDS).

Support Systems include all those management and support structures and systems that are essential for health services to be established and to become functional. Among these systems are the transport, management information, repair and maintenance, medicine and contraceptive supply, finance and budgeting, in-service training, and other important and necessary sub-systems.

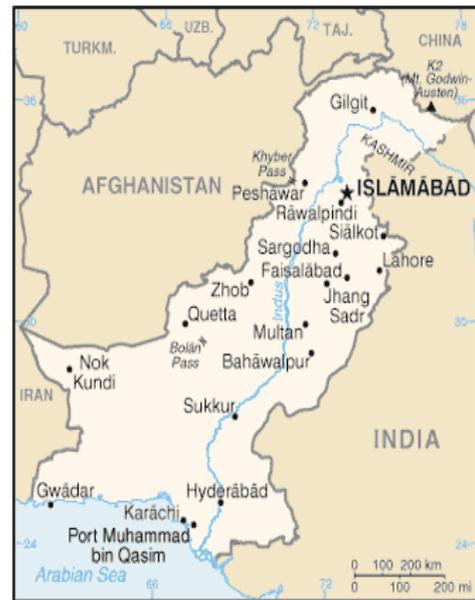
Ecosystems and Environmental Factors have an influence on the health system whether direct or indirect. Included, but not limited to these are, for instance the cultural, climatic, economic, geographic, political, and social settings the community lives in.

Outside the three concentric rings of the health system are other structures and systems of relevance to the health system of a particular community or region – **central structures** and relevant (to health) sectors. At a macro level, there are the central structures directly linked to the Health Service Delivery System.

This thesis is based on Kielmann's analytical model. The major outline under which the thesis has been written includes attempting to learn behaviours, quantifying the issue, and determining the health systems preparedness while assessing the health care providers' competencies, the programmatic approach to the issues, strategic guidelines and policy intents.

1.7 Islamic Republic of Pakistan

Pakistan "Land of the Pure," is located between 24° and 37° N latitude and between 61° and 75° E longitudes. Pakistan neighbours India on its east and southeast, Afghanistan to the north and northwest, Iran to the west and the Arabian Sea in the south. It has a common frontier with China in the northeast. Pakistan comprises a total landmass of 796,096 square kilometers with an estimated population of 173 million people, with a growth rate of 1.9% per annum. Pakistan is divided into five provinces. Balochistan, Punjab, Sindh, Khyber Pakhtunkhwa and Gilgit Baltistan, and two regions called the Federally Administered Tribal Areas (FATA) and Azad State of Jammu and Kashmir.



Pakistan is making progress towards the health-related Millennium Development Goals (MDGs), but the progress is slow as compared with its South Asian neighbours. Pakistan has started to experience the double burden of disease. Childhood and infectious diseases in the year 2000 were responsible for two thirds of the burden of disease (96). The life expectancy at birth in Pakistan is 66 years. Infant mortality rate is 65 per 1000 live births and the maternal mortality ratio is 276 per 100,000 live births (97). Details of national indicators and comparisons with MDGs 1,4,5,6,7 are shown in Table 5.

Table 5. National Targets and Progress on MDGs¹ 1,4,5,6,7

INDICATORS	1990	2000	2006	2006 Target PRSP	2010 Target MTDF	2015 Target MDG
MDG 1						
Malnutrition Prevalence, Weight for age (% of children U5)	-	41.5	38	33	28	<20
MDG 4						
Infant Mortality Rate	102	77	78*	63	65	40
Neonatal Mortality Rate	56	52	54*			
Under-five Mortality Rate	140	105	94*	80	77	52
Immunization 12-23 months	75	53	47*	82	90	>90
MDG 5						
Maternal Mortality Ratio	550	350	276*	350	300	140
Births by Skilled Birth Attendance	18	40	39*	75	60	>90
Antenatal Care	15	35	61*	50	70	100
Total Fertility Rate	5.4	4.5	4.1*	3.7	2.7	2.1
Contraceptive Prevalence Rate	12	30	30*	41.7	51	55
MDG 6						
HIV prevalence	<0.01		<0.01			<0.01
TB cases detected & cured	-		25%			85%
Malaria prevention & treatment			25%			75%
MDG 7						
Proportion of population (urban and rural) with sustainable access to a safe (improved) water source	53	69	66	70	76	93
Proportion of population (urban and rural) with access to sanitation	30	45	54	55	70	90

The health sector needs to enhance its performance in terms of coverage of essential services to significantly improve health outcomes, which will otherwise remain an obstacle to Pakistan's economic growth. The medium-term health strategy, outlined in Poverty Reduction Strategy Paper and Medium Term Development Framework envisages increasing public sector health expenditures focusing on prevention and control of diseases, reproductive health and addressing nutrient deficiencies. The

¹ Source: National MDG Report 2005

(*quoted from Pakistan Demographic Health Survey 2006-07)

recent Pakistan Demographic & Household Survey (PDHS) results indicate some improvements in health outcomes but significant challenges persist, including nutritional outcomes (97).

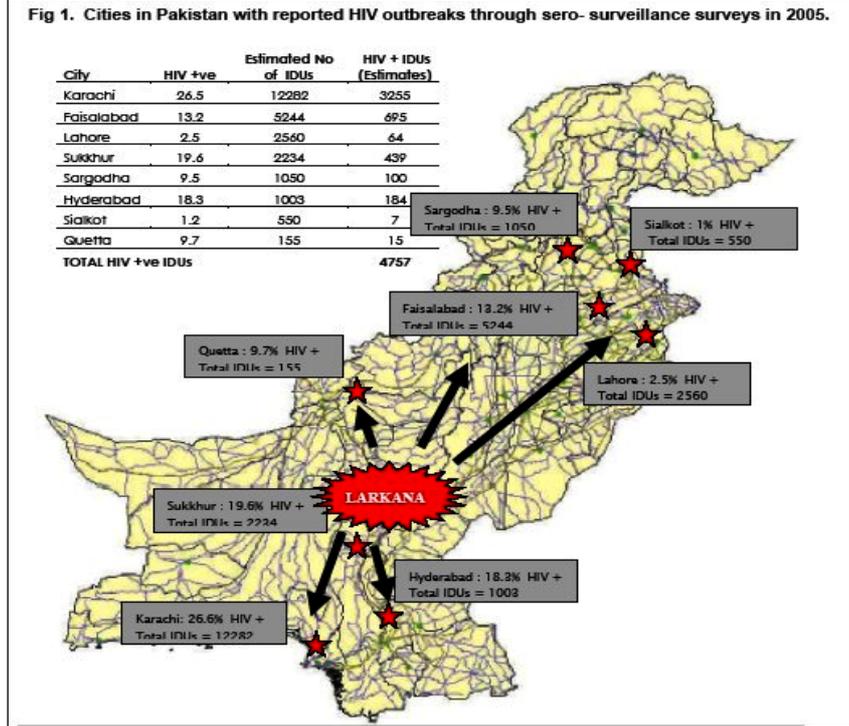
Lahore

Lahore is a municipal city. It has been the capital of Punjab province for nearly a thousand years. Legend had it that it was founded by **Loh**, son of Rama, the hero of the Hindu epic, the Ramayana. Others think that the name means Loh-awar, meaning a "Fort as strong as Iron". The city is built in the form of a parallelogram, the area within the walls, exclusive of the citadel, being about 461 acres. It stands on the alluvial plain traversed by the river Ravi. Lahore is the second most populous city in Pakistan, after Karachi. It has an estimated population of 10 million and a growth rate of about 2.1%. The female to male ratio is 108:100. The adult literacy rate is 47% with male and female rates of 57% and 35% respectively

1.8 HIV in Pakistan

In Pakistan, the estimated number of PLHIV was 96,000 in 2008, corresponding to an adult HIV prevalence of 0.1% (98). The heterogeneity and interlinking of injecting drug use and risky sexual behaviour, combined with low levels of HIV knowledge and prevention, and high levels of other sexually transmitted infections (STIs), indicate that there is potential for a rapid spread of HIV through the bridging population (99). In order to determine the disease burden of HIV and STIs, the first National STI / RTI study in Pakistan was conducted in 2004 (100). The study revealed a high burden of STIs among women selling sex, along with a low level of knowledge about AIDS. Among the 400 women selling sex who participated in the study in Lahore, 7% had syphilis, 12% *Neisseria gonorrhoeae*, 11% chlamydial infection, and 19% *Trichomonas vaginalis* infection. Furthermore, 24% had never heard about AIDS, and 26% had not used a condom with their most recent sexual partner.

Until recently, the major concern has been the prevalence of HIV among IDUs, which is on the rise. The first major reported outbreak among IDUs was in 2003 in the city of Larkana in Sindh province, where 10% of 175 IDUs were found to be HIV positive (101). Data from 2005 and 2006 clearly demonstrate the development of a concentrated epidemic among IDUs. For example, National Study on STI/ RTI in 2004 reported an HIV prevalence among IDUs in Karachi of 23% (100), which later in the same year was shown by the pilot integrated behavioural and biological surveillance (IBBS) to have risen to 26%. Results of the first surveillance round of IBBS conducted in eight cities in Pakistan have shown that HIV is beginning to establish its footholds among IDUs (102). The prevalence was reported to be more than 5% in six out of eight cities including Karachi (26.5%), Hyderabad (18.3%), Sukkur (19.6%), Sargodha (9.5%), Quetta (9.7%) and Faisalabad (13.2%) as shown in Figure 1.



However, the preliminary results of round 2 of IBBS present an even more alarming situation. The prevalence of HIV among IDUs was recorded at 51.5% in Sargodha (103, 104). The prevalence has increased in Karachi from 26.5% to 30%, in Hyderabad from 18.3% to 29.8% and Lahore from 3% to 6.5% among IDUs (105). The overall national prevalence of HIV among IDUs is 20.8% (95% CI: 19.4-22.3) (106).

It is not only among IDUs that HIV levels are rising: also of concern are the increasing levels of HIV prevalence among other MARPs. In Karachi, the HIV infection rate has recently increased from 4% to 7.5% among MSMs and from 1.6% to 3% among Hijras (transgenders). The round 2 IBBS survey also recorded a prevalence of 14.1% among Hijras in Larkana. With 13.5% of the women selling sex and 9.3% of MSM (including MSM and Hijras) having sex with IDUs, this poses a formidable challenge to contain the spread of HIV infection within the MARPs. Thus the stage in Pakistan is set for an explosion of the HIV epidemic (105). However, it is important to note that the HIV prevalence among women selling sex has so far remained less than 1% in Pakistan (107).

1.9 The bridging populations

The bridging populations of clients of sex workers, men on the move, and spouses of IDUs, have been known to transmit HIV from the most at risk populations (MARPs) to the general population (108). The national surveillance data extrapolation suggests that over 60 million sex acts are sold annually in Pakistan to 3 million clients, among which 55% are with women selling sex (109). In another study among 2400 men, about one third (30%) reported non-marital sex during their life time, of which 41% were with

women selling sex and 14% had sex with male sex workers (110). Another study among 600 internal migrant men indicated 13% had at least one non-marital sexual contact in the 12 months preceding the survey, 7% with a woman selling sex and 2% with a man (111), indicating bisexual behaviour. Other bridging populations identified in Pakistan include truck drivers, international migrant Pakistani workforce, and miners (107).

1.10 The context of women selling sex in Lahore

Sex work, though illegal in Pakistan, has had an institutional setting with a covert face of music and dancing for the last five hundred years among women selling sex (112, 113). The Mughal kings who ruled over current Afghanistan, Pakistan and India supported arts, crafts and music. The artists and the performers used to live near the Royal Forts. In these areas music, singing, dancing, and selling sex went on side by side. One such area in Lahore was called Heera Mandee (Market of Diamonds) (112). However, that is not the real meaning or origin of the name. Actually this mandee is named after Heera Singh, who was the son of a minister of Ranjit Singh's royal court (1801-1840 AD). However, slowly the aesthetic pursuit of art diminished and the area became the centre of selling sex in Lahore, especially by the British during their colonial rule, where they developed brothels in Heera Mandee for the recreation of the British soldiers (114). Over a period of more than one hundred years, the profession of selling sex continued with a covert face of dancing and singing that was legally permitted. During the late 1970s, the military ruler of Pakistan banned the sexual activities in the Heera Mandee. As a result, most of the residents involved in selling sex moved to various other residential areas of Lahore (112). It is important to note that the women selling sex in Lahore mostly do not sell sex during the Islamic month of Ramadan and the first ten days of Islamic month of Moharram.

1.11 TYPOLOGY OF WOMEN SELLING SEX IN LAHORE

Currently women selling sex in Lahore work in five different settings (109), as described in Box 5.

Box 5. Typology of Women selling sex in Lahore, Pakistan	
Street-based	Street-based women selling sex live at their homes, but solicit clients in public places such as busy streets and intersections, bus and train stations and marketplaces. Sexual transactions then occur at a venue chosen by the woman selling sex, and or the client.
Home-based	These women selling sex usually live with their families and are based at their own houses. Clients are solicited using mobile phones or through network operators. Sex work takes place either in the client's home or hotels, or a place provided by the network operator. Women selling sex at home are usually doing this on a part-time basis, operating when required for financial purposes.
Kothikhana-based	<i>Kothikhana</i> is a colloquial expression for a sex work venue that literally means grand house. However, <i>Kothikhana</i> s are generally small premises, which are rented by a madam and or broker where a small number of women selling sex come to sell sex during weekdays from 9 am to 5 pm. <i>Kothikhana</i> s are often in residential areas and are largely clandestine. A key feature is that their location moves from time to time when the madam determines that the current location is unsafe or unsuitable.
Brothel-based	Brothels are fixed venues, which are owned and operated by madams or other individuals or groups. Several women selling sex live in this house, which is licensed for singing and dancing, and which is located in a larger sex work or red light district and entertain clients there. The key feature of typical brothels is that they have a stable location that is known by local clients and network operators. Sex work takes place either at the brothel or at the client's house. These women selling sex usually work full time.
Call Girls	These are highly educated young girls engaged in selling sex. Contact is established through a network operator using a mobile phone. These are the highest paid among all.

1.12 Women Selling Sex – The Scale!

Recent estimates show that there are about 167,500 women selling sex in twelve urban cities of Pakistan, with an overall national rate of 4.4 women selling sex per 1000 adult women (107). The same study estimated that there were about 25,000 women selling

sex in Lahore, equivalent to a rate of 13.4 per 1000 adult women. The mean number of clients per woman selling sex in Lahore was estimated to be 46 per month. Furthermore, the total monthly client volume was estimated at 653,000 in Lahore, of which 69% were not protected (115). In Pakistan, the distribution of women selling sex by typology is given in Table 6, indicating that the least proportion of women selling sex operate through brothels (109).

Table 6. Percentage distribution of Women Selling Sex by typology

Typology	Proportionate distribution (%)
Street based	47
Home based	29.7
Kothikhana based	20.9
Brothel based	1.2
Call girls	1.2

1.13 The legal, social and religious context of sex work in Pakistan

The religious decree, law and social norms forbid sex outside of marriage and sex work on a whole is illegal in Pakistan. Sex outside of marriage was made illegal in Pakistan through the Hudood ordinance of 1979. The ordinance was widely criticized for its discrimination against women by allowing room for false incrimination of women for extramarital sex and denying justice for rape victims. In an attempt to amend the heavily criticized law, a Women Protection Bill was enacted on November 15, 2006. The Bill removes the right of police to detain people suspected of having sex outside of marriage, instead requiring a formal accusation in court. However, consensual or commercial sex outside marriage is still a crime under the new law and places the burden of guilt on woman selling sex rather than on clients (articles 371 A, 371 B, 377). The law treats children working in the sex trade as adults in the legal system, subjecting them to punishment rather than support or protection (116). Yet, the Round 2 surveillance found that 10.2% of the women selling sex were in the 15-19 age bracket (105). However, the easier social access of men to other men makes it possible for MSM to establish and increase their networks, thereby often combining a hidden bisexual life with a religiously and socially acceptable marital life with a female (117).

1.14 Health System of Pakistan

Health Care Delivery System of Pakistan

The health care delivery system of Pakistan has two major pillars, the public and the private sectors. The public sector has a community-based approach with community health workers (also called Lady Health Workers) and thereafter the primary, secondary and tertiary levels of service delivery. Health is a provincial subject and after the

devolution initiative in 2001, it has been further devolved to the districts. The public sector is underutilized, with only 20 percent of the population utilizing public sector facilities (118). The private sector has a major share of service delivery in the market, but is not regulated. The health sector on a whole comprises formal and informal sectors. The human workforce in the formal health sector of Pakistan consists of doctors, nurses, paramedical staff, homeopathic doctors, and Hakims². The informal sector consists of unqualified practitioners, spiritual healers and home based health practices. One can purchase any medicine over the counter in a chemist shop, which needs to have a licence to operate, but the people who dispense them are most often not trained pharmacists.

Health Care Providers

Health care providers (HCPs) are considered to play a pivotal role in the provision of preventive and curative services to individuals suffering from HIV/AIDS and STIs. The heterogeneity and interlinking of injecting drug use and sexual behaviours, combined with low levels of HIV/AIDS and STI knowledge and prevention in Pakistan, as well as relatively high prevalences of other STIs, strongly indicate that there is potential for a rapid spread of HIV through the bridging populations, resulting in an additional high burden on the health care delivery system (102, 105, 119).

1.15 Policy Guidelines

National Health Policy - 2009

The goal of the national health policy is to remove barriers to access to affordable, essential health services for every Pakistani citizen (120). In order to achieve this stated goal, the Government of Pakistan has developed policy intents and objectives, which are described in Box 6.

Box 6. Policy Intents – National Health Policy - 2009

- Provide and deliver a basic package of quality Essential Health Care Services;
- Develop and manage competent and committed health care providers;
- Generate reliable health information to manage and evaluate health services;
- Adopt appropriate health technology to deliver quality services;
- Finance the costs of providing basic health care to all Pakistanis; and
- Reform the Health Administration to make it accountable to the public.

The National Health Policy 2009 of Pakistan, though recognizing the increase in HIV infection in Pakistan, remains silent on its intent to address HIV and STIs.

² Hakim is a health care provider who makes, prescribes and dispenses medicines prepared from herbs

National HIV Policy of Pakistan

The vision of the national HIV Policy for the next ten years is for a healthy, prosperous nation that has responded effectively to HIV and that provides treatment, care and support for all people affected by HIV and AIDS (121).

Pakistan's response to HIV and AIDS is guided by a set of principles, as presented in Box 7.

Box 7. Principles of National HIV Policy

- Gender norms and relations are a key factor in determining who acquires HIV in Pakistan, and in determining treatment, care and support outcomes. Pakistan's national program acknowledges this and all programs and services will devise and implement strategies that address gender norms and relations. Addressing the prevention and care needs of women and girls will be a particular focus, combined with attention to male behaviour and cultural norms that increase the likelihood of women contracting HIV;
- The challenges that HIV and AIDS presents to Pakistan's development as a nation will be taken into account in all policies and programmes;
- People with HIV and AIDS will have the same rights as all other citizens, and will not be discriminated against, on the basis of their HIV status, gender, socioeconomic status or HIV-risk factors;
- Leadership across all sectors will be fostered and valued, and the capacity of each sector to contribute to the overall response will be strengthened. This includes community leadership, which will be encouraged and supported through the mobilization and support of communities to respond to HIV;
- All parts of society, including all levels of government, the private sector and civil society will be encouraged and supported to play a role in HIV and AIDS prevention and care and in reducing the impact of HIV and AIDS on individuals, families and communities;
- Approaches to HIV and AIDS prevention and care will follow international best practice and will be consistent with Pakistan's religious and cultural values;
- All persons will be provided with access to the information and support they need to protect themselves against HIV infection;
- The connection between HIV and AIDS prevention and care will be acknowledged in programme and service design - providing treatment, care and support to individuals and families affected by HIV and AIDS - will be prioritized as a core HIV and AIDS prevention strategy;
- Sustainability will be promoted by incorporating HIV and AIDS prevention and care initiatives into existing programmes; and
- The response will be backed up by sustained political commitment and by the mobilization of resources to sustain the required effort.

National HIV and AIDS Strategic Framework-2007 – 2012 of Pakistan

The National HIV and AIDS Strategic Framework 2007-2012 (NSF) is based on an assessment of the situation and the response to date, and takes into account the country's resource constraints in both human and financial terms (122).

The NSF establishes fundamental principles and identifies clear priority areas where increased attention is likely to have the greatest impact on preventing the further spread of HIV/AIDS in Pakistan. Further, it also aims to reduce the impact of the epidemic for those individuals, families, and communities that are already affected.

Finally, while it recognizes that HIV and AIDS is primarily a health issue, not forgetting the involvement of other sectors for a comprehensive response that addresses both the complex web of underlying causal factors as well as its equally complex consequences. NSF is based on four key strategic objectives as described in Box 8.

Box 8. Strategic Objectives of NSF

1. Scale up programme delivery;
2. Build the right capacity;
3. Create an enabling environment; and
4. Strengthen the institutional framework.

The total expenditure in Pakistan on health was 0.54% of the gross domestic product (GDP) in 2010 (123). The budget of the NSF was US\$ 293 million. The national and provincial plans of action for the enhanced response were budgeted at US\$ 200 million in 2007. However, due to limited fiscal space availability and improper donor coordination, so far the Government of Pakistan has only been able to raise US\$ 43 million from the Global Fund Round 9 grant and another US\$ 11 million from a regional Global Fund grant.

1.16 Rationale

From 2004 onward, the IBBS was focusing on HIV prevalence and related risky behaviours. Until 2006, no research was done or had been planned to estimate STIs and HIV along with the risky behaviours among women selling sex. Furthermore, the IBBS data was not shared outside NACP. There was no study done among MARPs to determine antimicrobial resistance to antibiotics. The basic question of why do women sell sex was never addressed. Furthermore, the HCPs providing clinical services were not assessed to determine their knowledge, attitude and practices related to HIV and STI management. Therefore this research was conducted to explore concepts, knowledge magnitude and health seeking behaviour related to HIV and STIs among women selling sex and also among HCPs to determine their knowledge, attitudes and practices on HIV/STIs.

2. Aim

The main aim was to explore and assess the concepts, knowledge, attitude, and practices (KAP), and determine the prevalence of HIV and STIs with associated risk factors, among women selling sex in Lahore, Pakistan. Moreover the research aimed to ascertain the KAP on HIV and STIs among health care providers in Lahore, Pakistan.

2.1 Specific Objectives

- To explore the factors influencing women to initiate and continue as sex workers and to explore perceptions of HIV/AIDS, STIs and related health seeking behaviour (Paper I);
- To estimate the prevalence of HIV and STIs and assess knowledge, attitude and risk behaviours related to HIV/STI among women selling sex in Lahore, Pakistan (Paper II);
- To describe the knowledge and health-seeking behaviour related to STIs and abortion among women selling sex in Lahore, Pakistan. (Paper III); and
- To assess knowledge, attitudes and reported practices relating to HIV/AIDS and STIs among private and public sector health care providers providing clinical services in areas in Lahore, Pakistan, where women sell sex (Paper IV).

3. Methods

3.1 Study Design

The research involved both qualitative and quantitative research methods. Qualitative research methods were used in Paper I, and quantitative research methods in Papers II, III, and IV.

The qualitative research methods involved individual interviews to explore the factors, which influenced women to initiate and continue as sex workers, and their perceptions of HIV/AIDS, STIs and related health seeking behaviour. This resulted in Paper I.

The quantitative methods involved a community-based study among women selling sex. Structured interviews were conducted in addition to taking biological samples to determine the prevalence of HIV and STIs including *T. pallidum*, *N. gonorrhoeae*, *C. trachomatis* and *T. vaginalis*. The interviews aimed to assess the KAP related to HIV and STIs and related health seeking behaviour, leading to Papers II & III. Another quantitative study, which led to describe the KAP on HIV and STIs among HCPs in the public and private sector, led to Paper IV.

All studies were conducted in Lahore. At the time of designing the studies, about 26,000 women selling sex were mapped in four concentrated areas of Lahore in 2004. Due to the sensitivity of the issues discussed and the possibility of increasing the discrimination against women selling sex, the areas are referred to as Area “A”, Area “B”, Area “C” and Area “D”. The research leading to Papers I-IV was conducted in Area “A”, Area “B”, and Area “C”. “Area D” was excluded, as it was the area where IBBS was taking place annually. Therefore, it was assumed that the participants would be sensitized to the research methods and questions. The summary of the study design and methods is presented in Table 7.

Table 7. Summary of the Study Design and Methods

Paper	Settings	Design / data collection methods	Participants and sample size	Data collection period
I	Urban setting of Lahore (Area “B”)	Community based; Exploratory study; Individual interviews	20 women selling sex	February – March 2007
II, III	Three urban settings in Lahore Area “A”, Area “B”, Area “C”	Cross sectional community based; Structured interviews; Laboratory based	730 women selling sex recruited during study period in clinics	September – November 2007
IV	Urban settings Area “A”, Area “B”, Area “C”	Cross sectional study; Structured interviews	200 health care public and private providers males and females	November 2007

The following sections will present the methodology of each paper separately. As papers II and III were produced from one study, they are presented together, and the differences between them have been indicated where necessary in the relevant section.

3.2 Paper I

Study settings

The research for paper I was conducted mainly in Area “B”, where the respondents were Kothikhana-based. Interviews were conducted in a separate room at the clinic established by the private sector organization offering primary health care and reproductive health services to women selling sex and the general population.

Study design

This was an exploratory qualitative study with the aim of understanding the human behaviour from the perspective of those being studied.

Study participants and sample selection

Inclusion criteria were “Females, engaged in selling sex, part time or full time, as a means of living”. “Part time” was described as when selling sex was not the primary means of living and being involved in selling sex at times when money or material was required. “Full time” was defined as when the sole means of living was earned by selling sex.

Initially a question guide was developed, which was pretested by a female anthropologist. Using the pretested question guide, three female interviewers who had prior experience of conducting qualitative research, further revised and pretested the question guide again. The peer educator working at the clinic was asked to invite women selling sex purposively with a variation in regard to age and experience as sex-workers.

Data Collection

The data were collected during February to March 2007. The interviews were conducted at the primary health care clinic, which was managed by a private sector organization. The clinic was part of the larger service delivery package including treatment services, free distribution of condoms, in-clinic and outreach behaviour change communication initiatives. Each clinic was managed by a female public health nurse (also called Lady Health Visitor [LHV³]), supported by a counsellor and an outreach peer educator who was hired from the women selling sex for peer education. The clinical service included free medical checkups and provision of free medicine for ailments of primary health care, and treatment of STIs by using syndromic management protocols as defined in the national STI management guidelines (124).

³ Lady Health Visitors are public health nurses who are trained for 3 years, including an 18 months course on midwifery. The term lady health visitor is specific to Pakistan.

Each enumerator conducted one interview per day, kept notes and transcribed, as the participants did not allow tape recording. Individual interviews were carried out with 20 females selling sex. Saturation was reached after 16 interviews. Thereafter, a focus group discussion (FGD) was held with males working as intermediaries (pimps) between the sex workers and their clients, revealing the presence of educated young girls in the group of women selling sex in Lahore. Using theoretical sampling four additional interviews were held with four such young educated girls in different geographical settings.

Data Analysis

Analysis of the in-depth interviews (IDIs) and FGD was completed using content analysis. The method of *content analysis* enables the researcher to include large amounts of textual information (125). Meaning units of the interviews responding to the objectives of the study were identified, condensed without losing meaning, and then coded. The software program Open Code was used for coding. The codes were grouped into categories. The underlying meaning of the data was abstracted into two sub-themes and a main theme. To ensure trustworthiness various procedures such as peer review, methods and investigator triangulation were undertaken to capture the multiple realities of the women. The research team composition was diverse and brought in several perspectives which ensured interpretation in its entirety.

3.3 Papers II and III

Study Settings

The research for paper II and III was conducted at Areas “A”, “B” and “C”, where the participants were Kothikhana and home-based.

Study Design

This was a cross-sectional, community-based, quantitative study conducted among women selling sex in Lahore, Pakistan.

Study participants and sample size

Women selling sex were defined as “Females, engaged in selling sex, part time or full time, as a means of living”. Exclusion criteria were if the woman was either pregnant or menstruating at the time of recruitment.

The sample size was calculated by using computer software EPI info version 6.04D, on the basis of an expected frequency of infection at $12\% \pm 3$ percent units, and a confidence interval of 95%, resulting in a total required sample size of 726.

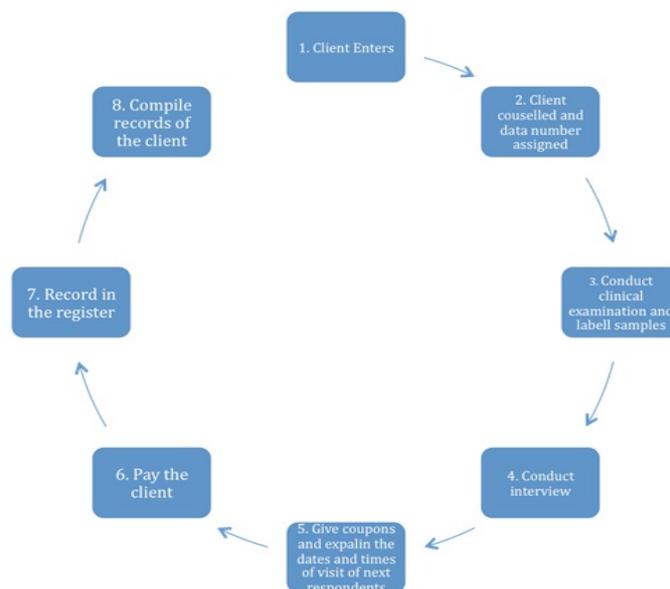
Prior to initiating the survey, three survey teams were selected. Each survey team was assigned to a clinic where the data collection was to take place. Furthermore, each team was responsible for pre- and post-test counselling, administration of the questionnaire, taking biological samples, labelling, storage and transport of the samples to the

Department of Pathology, Shukat Khanum Memorial Cancer Hospital and Research Centre, Lahore. Each team comprised of a female doctor with at least three years of postgraduate training in obstetrics and gynaecology, a public health nurse, a counsellor, a peer educator and a phlebotomist who was responsible for transportation of biological samples from their respective clinic to the hospital. The team members of doctors and public health nurses were trained for three days on syndromic management of STIs using the national treatment guidelines (124). Another two days were spent on training of administering a face-to-face questionnaire. The same group of doctors and public health nurses were trained in biological sample collection techniques for two days at the Sir Ganga Ram Hospital, Lahore, Pakistan. Thereafter a pre-test was conducted at each clinic, which included receiving a participant, conducting pre-test counselling by the counsellor, assigning the unique four digit identity numbers and conducting an interview by the public health nurse, collection of biological samples, labelling, and record keeping by the female doctor, and despatching the samples to the hospital by the person responsible. At the hospital, the laboratory technicians assigned to the survey team received the samples. The pre-test was supervised both by the author of the thesis and the field manager. The whole process was overseen by the co-supervisor in Pakistan and reported the same day to the principal supervisor and co-supervisor in Sweden. Thereafter all of the team members met to discuss the difficulties faced, which were addressed by the author of the thesis.

The interviews (papers II and III) and biological sample collections (papers II) were conducted at the primary health care clinics, which were managed by a private sector organization (as described earlier).

A flow chart of events is shown below as Figure 2, to describe the event that took place at the clinic.

Figure 2. Flow chart representing the flow of events that took place with each participant in each clinic



The participants were recruited using respondent driven sampling (64). On the first day of the survey, the author of the thesis visited each of the three clinics. All of the women selling sex present at the time of the visit were briefed about the study objectives and the design. An initial verbal consent was taken from the participants to become the seeds to initiate the survey. Thereafter a participant was randomly selected using a lottery method as a “seed”. Three coupons were given to each “seed” woman to bring three women selling sex that they knew. The date and time of the visit were specifically mentioned to the seeds. Each seed was successful in recruiting three more women, who underwent the whole process as described above. This formulated wave one. Each of these women selling sex was given three more coupons with specified date and time of the visit. Each clinic was working for six days a week and for eight hours a day, and hence each day six participants were managed. This went on for five such waves. Each potential participant was recruited by her recruiter and if she did not come on the specified date, contact was established with her recruiter by the clinic based peer educator. The peer educator was a woman selling sex from the specified area and was employed as part of the outreach behaviour change communication intervention. Except for on two occasions, when the participant did not come on allotted time due to deaths in their respective families, the rest of the participants came according to schedule. The chains were followed carefully to ensure that the same woman did not return and also to ensure that she was a woman engaged in selling sex. Hence there was no break in the chain of recruitment and by the end of the 7th week of the study the required sample size was reached.

Data Collection

The data were collected from September to November 2007. Standardization of clinical examination, biological specimen collection, labelling, storage, transportation and questionnaire administration was ensured by using the guidelines of National AIDS Control Program of Pakistan and following the phlebotomy procedures as defined by the College of American Pathologists. Serum and other appropriate biological samples were obtained from all participants and tested for HIV, *T pallidum*, *N. gonorrhoeae*, *C. trachomatis* and *T. vaginalis*. The biological sample collection, storage, and transportation methods along with their laboratory diagnostic tests for each pathogen are described below.

HIV

5 ml of venous blood was withdrawn and placed in a vacutainer tube. Serological screening for HIV was performed using AxSYM HIV ½ gO kit (Abbott Laboratories, Wiesbaden, Germany). Screening positive HIV samples were confirmed using Capillus HIV 1/HIV 2 (Trinity Biotech, Wicklow, Ireland).

T. pallidum

5 ml of venous blood was withdrawn and placed in a 5 ml vacutainer tube. Serological screening for *T. pallidum* was performed using Immunotrep RPR (Omega Diagnostics

Limited, Alva, Scotland, United Kingdom (UK)). Screening positive *T pallidum* samples were confirmed using TPHA (Randex, Antrim, UK).

N. gonorrhoeae culture and sensitivity

For the culture and sensitivity testing of *N. gonorrhoeae*, endocervical specimens were collected using Copan swabs (Copan, Brescia, Italy), placed in Amies charcoal-containing transport medium (Copan, Brescia, Italy) for 1-2 h, and then inoculated aseptically on Thayer-Martin agar (Oxoid Ltd, Cambridge, UK) and chocolate agar plates at the clinic. Inoculated plates were immediately placed in an atmosphere containing 5% CO₂ (using CO₂ sachet in 2.5 jars) at 37°C. A smear for Gram stain was also made using a second swab. The inoculated plates were transported in CO₂ jars at room temperature to the laboratory within two hours. In the laboratory, plates were incubated for up to 72 hours (checked every 24 hours) in a humid environment containing 3-5% CO₂ (CO₂ incubator). The GC plates were examined after 48 hours. A presumptive diagnosis of *N. gonorrhoeae* was made by performing Gram stain, oxidase test and catalase test. Pure colonies were confirmed as *N. gonorrhoeae* by API NH (bioMérieux, Marcy l'Etoile, France). All isolates of *N. gonorrhoeae* were tested against penicillin G, ceftriaxone, ciprofloxacin, tetracycline, azithromycin, doxycycline, and ofloxacin by disc-diffusion method on GC sensitivity agar, incubated overnight at 35-36°C and results were recorded. *N. gonorrhoeae* ATCC strain 49226 was used for internal quality control measures.

C. trachomatis and *N. gonorrhoeae* polymerase chain reaction

For diagnosis of *C. trachomatis* and *N. gonorrhoeae*, endocervical specimens were collected and analyzed using AMPLICOR CT/NG PCR (Roche Diagnostics, Indianapolis, USA), including AMPLICOR *Chlamydia trachomatis* detection kit and AMPLICOR *Neisseria gonorrhoeae* detection kit and in accordance with the instructions of the manufacturer. Three duplicate sets of positive and negative kit controls were also processed in each batch to check the validity of the batch run. An internal control was included with each specimen using Amplicor internal control kit to check the validity of each specimen. All PCRs were performed and interpreted in accordance with the instructions from the manufacturer.

T. vaginalis

High vaginal swabs were sampled, immediately inoculated into InPouch TV Culture System (BIOMED DIAGNOSTICS, Oregon, USA), incubated and subsequently interpreted in accordance with the instructions of the manufacturer.

Data Analysis

Epi info software version 6.04D and SPSS 13 (SPSS Inc., Chicago, Illinois, USA) were used for both papers II and III. For paper II, frequencies, proportions, mean, minimum, maximum were used for the analysis. Pearson's chi-square analysis was performed for testing associations between identified risk factors and specified diagnosed infections. Multivariable logistic regression was employed to indicate influencing factors on HIV /

STI prevalence. These included age, education, marital status, religion, place of work, condom use, duration of selling sex, number of sexual partners per day, injecting drug use and blood transfusion. In addition RDS Analysis Tool v5.3 was used to estimate the transition probability (probability of one group recruiting the other), mean network size based on the median age, homophily (a measure of preference for connections to one's own group, which varies between -1 (completely heterophilous) and +1 (completely homophilous), and the confidence intervals.

For Paper III, frequencies, proportions, mean, minimum, maximum were used for the analysis. Pearson's chi-square analysis was performed for testing associations. Seeking treatment was assessed with predicting factors such as age, education, place of work, number of clients and consistent condom use. A binary logistic regression model was used. The variables described were entered into the model and controlled for the outcome variable of interest, which was 'seeking treatment'.

3.4 Paper IV

Study Settings

The research for paper IV was conducted at Areas "A", "B" and "C".

Study Design

The research design for paper IV was a cross-sectional, quantitative study, which was conducted among HCPs from both private and public sector in Lahore, recruiting HCPs from three areas where women sell sex.

Study Participants and Sample Size

An HCP was defined as "a person who delivers services in a systematic way professionally to any individual in need of health care". Since the KAP of HCPs regarding HIV/AIDS and STIs in Pakistan were mainly unknown, it was assumed that the prevalence of the phenomena was 50% and using a confidence interval of 95%, a sample size of 200 was calculated.

HCPs of the private sector that were registered with the Green Star Social Marketing Network (GSM) were recruited. There are four categories of HCPs in the GSM Network. These include (i) female doctors; (ii) family physicians; (iii) LHV's; and (iv) chemists. In the public sector, four tertiary care hospitals were in the vicinity of the three surveyed areas. Participants (n=100) from these hospitals were female doctors from the Department of Obstetrics and Gynecology.

There was a sampling frame available for the HCPs working in the GSM network. At the time of the survey, there were 103 HCPs offering clinical services in Areas "A", "B" and "C". Since we had to interview 100 HCPs from the private sector, we interviewed the first 100 after taking appointments.

Due to administrative reasons, there was no sampling frame available for the public sector HCPs in the three tertiary care hospitals. Each hospital has speciality wards with units headed by a professor. Each professor of a unit has at least one associate professor, one assistant professor, 2 registrars, five medical officers, and almost the same number of clinical interns. In order to interview the maximum number of HCPs on the day of visit, the unit on call was interviewed. In total we approached 110 health care providers and 100 agreed to be interviewed. The ten HCPs who refused to take part in the study cited limited time as their reason.

Data Collection

The data collection method in paper IV was face-to-face interview using a pre-tested questionnaire by a team of interviewers that was trained for three days. The questionnaire addressed demographic characteristics, knowledge and attitudes regarding HIV/AIDS and STIs, as well as STI management practices. Knowledge about AIDS was defined as “correct” if the HCPs could cite two correct modes of transmission and prevention of HIV each, one of which had to be sexual intercourse for transmission and condom use for prevention of HIV (as defined by National AIDS Control Program (NACP), Islamabad, Pakistan). Knowledge about the diagnosis and treatment of STIs was considered as ‘correct’ based on the national guidelines on STI management (124).

Data Analysis

Epi Info software version 6.04D was used for data entry. Data were processed and analysed using SPSS 13 (SPSS Inc., Chicago, Illinois, USA). Frequencies, proportions, mean, minimum, and maximum were used for the analysis. Pearson’s chi-square analysis was performed to test associations between predictors and level of knowledge of STIs in each group separately. Multivariable logistic regression analysis was employed to indicate predicting factors for correct management of STIs. Factors included in the analysis were age, education, place of work, knowledge about HIV/AIDS, knowledge about STIs, correct knowledge of diagnosis and treatment of STIs.

3.5 Ethical Issues

Ethical approval was given by the Ethical Committee of the Pakistan Medical Research Council, Islamabad, Pakistan (Ref: F-4-87-1/Project-NBC/06/RDC dated 31 July 2006) for conducting research, data analysis and write up of manuscripts in Pakistan, and the Regional Ethics Committee, Stockholm, Sweden (Ref: Protokoll 2006/1:12 dated 12 December 2006) for data analysis and write up of manuscripts in Sweden.

Paper I. Informed written consent was sought from all participants. All the study participants were informed about the aim of the study, and what was expected of them. They were also informed that the data would be kept anonymous, and that they could

refuse to participate or disrupt the interview at any given time without affecting their future interaction with the service providers at the service delivery outlets.

Paper II and III. Participation was linked confidential. Informed written consent was received from each participant. All the study participants were informed about the aim of the study, and what was expected of them. They were also informed that the data would be kept anonymous, and that they could refuse to participate or terminate the interview at any given time without affecting their future interaction with the service providers at the service delivery outlets. All participants were given access to their biological results with appropriate counselling and treatment. Participants who tested HIV positive were referred to the Voluntary Counselling and Testing Centre in Lahore for monitoring the status of HIV infection and future clinical management and rehabilitation.

Paper IV. Participation was confidential and informed written consent was received from each participant. All the study participants were informed of the aim of the study, and what was expected of them. They were also informed that the data would be kept anonymous, and that they could refuse to participate or terminate the interview at any given time.

4. Results

4.1 Poverty of Opportunity Forcing Women into Prostitution - A Qualitative Study in Pakistan (Paper I)

Twenty women participated in this research study. Among these, 16 were married and the remaining single. Furthermore, 13 were illiterate and the rest had completed different levels of school education. Their age range was between 15 to 35 years.

Analysis led to the formulation of the main theme, identified as “Poverty of opportunity forcing women into prostitution,” which drew upon two subthemes: “Web of prostitution” and “Factors influencing vulnerability.” The analysis chronology is placed as Table 8. For the purpose of research, we defined “web” as a “complex intricate trap, network, or an arrangement, which eventually entangles its victim”.

Table 8. Analysis Chronology

Theme	Poverty of opportunity forcing women into prostitution				
Sub-themes	Web of prostitution		Factors influencing vulnerability		
Categories	Stepping into the web	Entangled and remaining in the web	Knowledge	Health-seeking Behaviour	Risks

Women selling sex were kothikhana-based. Almost all of the kothikhana-based participants were illiterate and married. Some of them had left their roles as housewives to seek additional work in order to enable them to get enough money to feed and educate their children and contribute to the household expenses. They had either started to work as maids in homes or as factory-workers. Their husbands did not support them financially or emotionally.

Furthermore, the family and social support for these women was minimal. However, the women had the courage to move out and make more money in other settings. But, these women were either not content with this additional income, due to the ever-increasing cost of living, or were humiliated by being raped by the male head of the household or the employer of the factory.

“There are several reasons for selling sex. One is the issue of food. When you have no food there are only two solutions. One is to starve and die and the other is to eat and live. Girls choose to eat and live. Then there are husbands and their relatives, who don’t support you.” (19 years old, married, illiterate)

Some of these illiterate married women were living with their in-laws after their husbands had died, gone abroad to earn money or married another woman. These women were sometimes also subjected to sexual abuse by their in-laws. Complaining to other family members about the sexual abuse created only more hardship as nobody believed them. Feeling insecure and facing the humiliation of rape, these women were forced to seek help. They needed shelter, money to survive and to ensure that their children were not exposed to hunger and deprived of the basic necessities of life. The peers they consulted referred them to the women running the business of selling sex.

The educated participants were 15-22 years of age. They were studying in high school, medical school or at the university. These had the basic necessities of life. However, the desire to move upward to a higher social status and gain more material things or assets typically led them to fall in love with a rich class mate, a relative of a class mate or someone else with high social status. Some of these young women were then introduced to their male friends for sexual services and sometimes subjected to rape and subsequently blackmailed for continuous availability.

“I never had money for things I wanted. I wanted the best perfumes, the best clothes, which my father could not afford. I wanted to roam around in the latest model cars, my father could not afford. All he could afford was to give us food at home and books to read in school. I had to go in his old Corolla and my friends would laugh at me. I do this for money.” (19 years old, single, medical student)

The families of most of the participants were unaware of the fact that the women and girls, who left home with the intention to earn money or study, were part of the network selling sex. The fear that their families would kill them if they found out what they were doing made it harder for them to leave the web. However, there were some participants whose families did know about their profession and did not object to it.

For the young literate participants the issue of virginity was important. Some of them said they would be divorced on their wedding night if their husbands found out that they were not virgins. Furthermore, they feared being blackmailed and emotionally harassed by their clients after their marriage.

“You know that it is very difficult for an unmarried girl who is not a virgin to be accepted. So what should I do? Tell me. Will you marry me or will you marry your son to me if he is old enough.” (22 years old, single, university graduate)

Being abused, humiliated and unable to get the respect they desired, they got stuck in the web. Opting for survival to avert hunger and have a continuous source of income, the participants resorted to selling sex. This was termed as “easy money” to be used not only for their survival but also for the survival of their families. Furthermore, the social and cultural perception that a girl should not return to her father’s home after marriage even in the case of an unpleasant event at her husband’s home, made it still harder for some of the participants to get out of the web.

Most of the participants had heard about AIDS, but did not know about HIV. Most of them described AIDS as an incurable disease. The participants believed that AIDS was caused by having sex with dirty men. Dirty men were described by the participants as men who were hygienically unclean and did not look healthy. These women also believed that AIDS was brought to Pakistan by foreigners and tourists. Some of the participants thought AIDS was a sign of God's wrath. The illiterate participants thought that AIDS started with monkeys and having sex with animals. However, most of the participants thought that AIDS was contracted only if condoms were not used. Transmission of AIDS was also believed to be related to saliva, breath and sweat. Some of the literate participants had recently heard about antiretroviral therapy. They thought that having such medicine was a good reason for not taking any preventive measures. They believed that having unprotected sex enabled them to satisfy their clients and get a regular stream of clients. For the management of health problems, the participants went to a spectrum of service providers in the formal and informal sector including doctors, LHVs and Hakims. Their reasons varied from getting good services, to the service provider being their own client. All of the participants experienced side effects of the medicines for treatment of STIs. These included flushing, headache and dizziness. Asked about why medicine worked at certain times and did not work at others, the participants were of the opinion that it all related to the day of the menstrual cycle, the potency of the medicines, and the strength of the germ.

Whereas all the women claimed to be using condoms, none of them were using them consistently. All of them maintained that they reduced the client's pleasure and that the client was more important, being the major source of income.

"But let me tell you one thing. Twenty out of a hundred men listen and put on condoms. The rest of them don't listen to us. These men come here to get pleasure. They give us the money for this pleasure. If I refuse to have sex just because I want them to use condoms, I will not have any clients and I will starve to death." (20 years old, married, illiterate)

4.2 HIV, STI Prevalence and Risk Behaviours among Women Selling Sex in Lahore, Pakistan (Paper II)

A total of 730 women, out of a reported network of 5,266 women selling sex, participated in the study. Among these, 66% were Kothikhana-based, and the remainder were home-based.

The median age of the participants was 30 years (range 13-50 years), among whom 60% had not attended school, and 91% were married. The participants had been selling sex for a median of seven years (range 1-35 years). They reported a median of three clients per day (range 1-12). Seven percent of the participants also had female clients. The median fee per sexual contact was Pakistani Rupees (Rs) 250 (3 Euro; range 0.2-61 Euro). Ninety one percent of the participants cited poverty and financial reasons for starting to sell sex, and 5% said that their mothers-in-law had forced them into selling sex. Almost all of the participants (99%) said that they continued to sell sex for

economic survival. “Always using a condom” was reported by 65% of the participants. Among these, 99% reported using condoms for prevention of pregnancy, 66% for the prevention of HIV and 58% for STI prevention. Blood transfusion was reported by 16% of the participants following gynaecological obstetrical surgeries. Among these, 54% claimed that the transfused blood was tested for HIV, hepatitis B and C and malaria. Three participants (0.4%) reported injecting drugs, and one among these reported sharing needles or syringes in a group.

The overall prevalence of HIV and any non-viral STI was 0.7% and 18.5% respectively. None of the HIV-positives had a concomitant STI. Among the women who had multiple current non-viral STIs, 1.4% and 3.6% had concomitantly three and two STIs respectively, and 13.6% were infected with one STI. Among the three areas surveyed, women selling sex in Area B had the highest prevalence of HIV (1.2%), *T pallidum* (7.9%), *N. gonorrhoeae* (10.0%), *C. trachomatis* (14.9%) and *T. vaginalis* (11.2%). Logistic regression was applied for HIV and STIs, and risky behaviours. Inconsistent condom use was significantly associated with the likelihood of being infected with *N. gonorrhoeae* and *C. trachomatis*. The odds of being infected with *C. trachomatis* and *N. gonorrhoeae* were 2.1 (CI 95%; 1.1-3.8) and 1.9 (CI 95%; 1.1-3.5), respectively, if women reported not “always” using condoms as compared to if they reported “always” using condoms. Among the participants, 19% and 83% had heard about HIV and AIDS, respectively, and 55% did not recognize themselves at risk of getting AIDS.

The antimicrobial resistance testing was also performed for 17 *N. gonorrhoeae* isolates. All *N. gonorrhoeae* isolates were found to be sensitive to azithromycin and ceftriaxone but 76% were resistant to the current choice of drug in Pakistan i.e. ciprofloxacin. Results are shown in Table 9.

Table 9. Antimicrobial Resistance Pattern. n=17

Drugs	Sensitive Number (%)	Intermediate Number (%)	Resistant Number (%)
Azithromycin	17 (100)	0	0
Ceftriaxone	17 (100)	0	0
Ciprofloxacin	2 (12)	2 (12)	13 (76)
Ofloxacin	2 (12)	3 (18)	12 (70)
Penicillin	1 (6)	4 (24)	12 (70)
Tetracycline	3 (18)	4 (24)	12 (70)

4.3 Health Seeking Behaviour of Women Selling Sex in Lahore, Pakistan (Paper III)

Thirteen percent of the participants said that it was common to have a vaginal discharge. Whereas 25% participants could not name any STIs, the remaining participants recognized STIs as either leucorrhoea or AIDS. When asked about the modes of transmission of STIs, 62% cited sexual transmission, 33% said by germs and

26% said through sharing clothes. Regarding complications of STIs, 22% considered that they could lead to death, while a similar proportion (22%) of participants did not know of any complications. About 10% believed that STIs could cause infertility and 15% cited that they could cause complications during pregnancy. When asked about the complications of the STIs, 22% thought that it would cause death, and a similar number of participants expressed ignorance about the complications.

About two thirds (65%) participants complained of having suffered from what they considered STI(s) in the previous six months. Among these, 28% sought treatment from service providers in the private sector. The participants who sought treatment for STIs, 53% went to a doctor in the private sector, 19% to an LHV, 12% to a Hakim, 10% to a homeopathic doctor, and 6% to a medical store. Among these, 67% were not told of the diagnosis. They were given a spectrum of medicines with a treatment duration ranging from 1 day to 3 weeks. These medicines included oral tablets and capsules, intra-vaginal tablets, intravenous infusions and or herbal medicine to drink. None of the participants could recall the name of the medicines that they had received. The duration of the treatment ranged from 1 day to 3 weeks. Those who sought treatment paid Rs 500 (median) (Euro 6, range - Euro 0.01-96) for both consultation and medicines. The majority of participants (78%) said that they were not cured by the treatment. When asked why medicines sometimes do not work, 57% cited that they did not know, 20% questioned the quality of the medicines, 10% said there was a lack of compliance in taking prescribed medicines, 8% said that it was related to the severity of the disease, and 5% expressed dissatisfaction about their doctor's diagnosis.

Women selling sex who reported consistent condom use were 1.5 times (CI 95%: 1.1-2.2) more likely to seek treatment than women who did not consistently use condoms. Among those who sought treatment, 19% completed the full course of medication. Among those who did not complete the treatment, 40% said that they were unable to afford it, 31% cited that their condition had improved, 18% forgot to do it, 9% thought it was a mild disease, and 2% cited that they stopped due to the side effects of the treatment. Among the participants who did not seek treatment, 43% cited financial constraint as the main reason for not seeking health care. A further 34% thought that the STI did not require medical treatment, and 23% perceived it as shameful to disclose to someone that they had an STI.

Ninety percent of the participants reported having been pregnant during their lifetime. Among these, all had had an abortion at least once (range 1-6). Abortions were at a service provider's clinic (60%) or at home (40%). The abortions were carried out by female doctors (40%), traditional birth attendants (31%), LHVs (20%), nurses (6%), or induced by the respondents themselves (2%).

4.4 Knowledge, Attitude and Practices Regarding HIV/AIDS/STIs among Health Care Providers in Lahore, Pakistan. (Paper IV)

A total of 200 HCPs from the public sector (n=100) and private sector (n=100) were interviewed. The median age of the HCPs was 30 years (range 22–71), and 61% were females. Forty-five percent of the HCPs had ‘correct’ knowledge of the transmission and prevention of HIV/AIDS (private 45%; public 46%). Furthermore, 63% had correct knowledge about the transmission of AIDS (private 69%; public 57%). In addition, 73% had correct knowledge about preventive measures (private 62%; public 85%). Among the HCPs, only 42 (21%) had seen a patient with advanced HIV infection (private 19%; public 23%). Among these 42, nine HCPs claimed to have treated them clinically. Only two HCPs, both in the public sector, had been trained to treat cases of advanced HIV infection. The HCPs were asked to name all the STIs they were aware of. Compared to the private sector, the HCPs from the public sector were more aware of STIs, modes of transmission and preventive measures. Among the HCPs, 78% cited gonorrhoea as an STI, followed by AIDS (70%), syphilis (68%) and HIV (43%). Only 13%, 14%, and 21% recognized *T. vaginalis* infection, chlamydial infection, and herpes infection as STIs. Most of the HCPs (86%) were aware that STIs could be transferred through sexual contact. Furthermore, 40% cited blood transfusion, followed by sex without condom (37%) as modes of transmission.

When asked about preventive measures, 69% of the HCPs expressed that using a condom could prevent STIs, followed by 40% who cited transfusion of screened blood, and 39% considered being faithful to their partner was necessary to prevent STIs.

Among the HCPs, an equal proportion from both sectors (18%) expressed apprehension and or fear of treating patients with HIV/AIDS and STIs primarily revolving around the fear of acquiring HIV/AIDS and STIs themselves. The HCPs from the private sector reported treating a median of 20 patients with STIs per month (range 2–80); whereas public sector HCPs were managing half that number, 10 per month (range 4–60). The HCPs claimed to diagnose patients with STIs based only on signs and symptoms in 35% of cases, based only on laboratory diagnostics in 9% of cases, and based on both in 11% of cases.

Among the HCPs, 82% were not aware of the terminology “syndromic management of STIs”. Amongst the remaining 18% who claimed to know about syndromic management of STIs, only 7% had received training in the subject for a median of five days (range 2-7 days). Furthermore, when asked if they were using syndromic management for management of STIs, 12% and 24% from the private and public sector respectively reported that they did. For treatment of the STIs, antibiotics were prescribed to a median of 20 STI patients per month. The decision to prescribe antibiotics was based on observation of signs in 59% of cases, symptoms in 64% of cases, and results of laboratory tests and following the syndromic management guidelines in 11% of cases each.

In addition, logistic regression was applied to correct knowledge of diagnosis of gonorrhoea and syphilis and also to correct knowledge of treatment of gonorrhoea, syphilis and vaginal discharge with predictors including age, sex, and profession as a doctor or non-doctor, sector of work (public vs. private). The odds ratio of having the correct knowledge to diagnose gonorrhoea and syphilis was 2.1 (CI 95%, 1.2–3.8), if the HCP was a female medical doctor working in the public sector as compared to otherwise.

5. Discussion

This thesis presents a social phenomenon in Pakistan, a series of associated medical problems and challenges to the health system. It remains a daunting challenge to address the issue of selling sex in a society influenced by imbalanced gender roles, coercion, limited opportunities, changing behaviours, and a failing health system. This thesis presents a new set of challenges beyond the health system and attempts to raise questions and seek solutions to provide the basics of human values and provision of needs to survive.

5.1 Selling sex – Is this the answer to survival

Participants in our research (paper I, II) opted to sell sex after making attempts to make a living otherwise. Factors such as illiteracy, limited financial support from families, limited work opportunities, peer misguidance, social insecurity, and desire to move up in the society brought these women to sell sex. The research also indicates strengthening of the institution of selling sex, whose outlets have expanded from the commercial brothels to kothikhanas, homes and streets. This measure to remit funds to homes for survival also profits urban-based network operators. Sixty-six percent of the women in our research (study II) had started to sell sex seven years preceding the survey, implying that they were not selling sex before the year 2000. Analyzing the economic indicators of the decade of 1990 (also known as the lost decade in Pakistan), the Ministry of Finance indicated that the poverty head count ratio⁴ decreased from 26.1% in 1990-91 to 23.3% (123). However, it is important to translate these proportionate distributions to absolute numbers. In 1990-91 and 2005-06, the population of Pakistan was 115 million and 156 million, respectively. Hence, despite the fact that we see a 2.8% decline in poverty head count ratio, in absolute terms, there were 30 million people in 1990-91 who could have been living in the poverty head count as compared to 35 million who were living under the same criteria 15 years later. Also, the poverty line measured in Pakistani currency increased from Pak Rs. 673.40 in 1998-99 to Pak Rs. 723.40 in 2000-01 to Pak. Rs. 948.47 in 2005-06 (123). The food inflation increased from 2.5% in 2001-02 to 10.2% in 2006-07 and further to 12% in 2009-10 (123). All these economic indicators presumably had an effect on lifestyles, and may have limited options for people to survive economically. Whereas poverty, materialism, and determination to rise were cited as major reasons to sell sex, we question the societal role to respond to this changing behaviour. As 91% of our participants selling sex were married and 7% were having females as their clients, these observations depict a changing social value system, a different mindset, and an altered social behaviour. Why is it that only women have resorted to selling sex? Have men in the same environment started to sell sex in Pakistan as well for survival and supporting their families? Is it the patriarchal system, unequal power relationship (126), or a mind-

⁴ Proportion of the population below the national or international poverty line.

set related to poverty, or is it that monetary needs of the families of women who sell sex take precedence as there are substantially higher economic rewards in selling sex than any other means of earning money available to most of the women who sell sex? This realization of monetary incentive combined with the presumed responsibility that they must support their families could have acted as a strong force to counter the stigma attached to such work. Most women selling sex, such as those in our study, have limited job opportunities, due to little or no education. Unmarried participants in our research had the fear of not being able to get married as they had lost their virginity. Such values are different across the world: in Thailand the communities believe that women selling sex can marry which is indicative of lack of severe or lasting social stigma (127). In South Africa, women sell sex for money outside the commercial sex work under the concept of *ukuphanda*⁵. Women who sell sex as informal sex workers do it to survive financially (128). Participants of our study also cited violence and a fear for their lives from their families if they found that they were in sex work. By remaining in the web of selling sex (study I), women selling sex are at the risk of physical, emotional, and sexual abuse, as well as at elevated risk of getting infected with STIs and HIV (129).

5.2 The burden of HIV and STIs

It is imperative to note that HIV infection does not take place in isolation and the vulnerability is dependent upon the social and local context. The risk environment of HIV includes not only biological vulnerabilities, but also is dependent upon social values, economic forces and societal practices to which men play a vital role (68). The characteristics and the factors that initiate men's desire to buy sex have not been studied in Pakistan and requires further exploration of the social, religious and local context to understand the risk environment of HIV as a whole.

The HIV epidemic in Pakistan is male driven. IDUs and Hijras have experienced concentrated epidemics of HIV infection (102, 105). IDUs have an overall HIV prevalence of 20.8% (95% CI: 19.4-22.3) in eight major cities of Pakistan including Lahore (106). HIV has started to trickle into other risk populations as well. The prevalence of HIV infection has been reported to be 6.4% among transgender (95% CI: 5-7.7), and less than 1% among MSM (0.9%; 95% CI: 0.3-1.5) (106). However, the prevalence of HIV has remained less than 1% among women selling sex across Pakistan. In four major studies conducted in Pakistan, HIV infection has ranged between 0.2% and 0.7%. The prevalences of STIs, estimated in 2004 in Area "D" of Lahore were higher, as compared with the prevalences estimated in Areas "A", "B" and "C" (Paper II). This could be attributed to the introduction of the preventive interventions among the most at risk population in various urban setting in 2005 through public private partnership by the Ministry of Health through the National and Provincial AIDS Control Programs. These interventions were focused on provision of curative and preventive services, including syndromic management of STIs, provision

⁵ A Zulu verb that is used to describe sex for money.

of condoms and behaviour change communication. Such an intervention led to doubling of reported condom use among women selling in Lahore, from 32% in 2005 to 65% in 2007. Furthermore, there has been a reduction in number of sexual partners per day from a median of 7 to 3 during the same period. Focus group discussion with the network operators revealed the increasing gap between demand and supply with latter increasing due to reasons cited in Paper I. Details are given in Table 10.

Table 10. HIV and STI prevalence among women selling sex in Pakistan 2004-2007

Indicator	National Study of Reproductive Tract and Sexually Transmitted Infections – Survey of High Risk Groups in Lahore and Karachi – 2005 (119)	HIV Second Generation Surveillance in Pakistan National Report – Round 1 2005. (102)	HIV Second Generation Surveillance in Pakistan National Report Round II 2006 – 07 (105)	Sexually Transmitted Infections in HIV Among People with HIV Risk Behaviour April 2008 (130)	Paper II
Method for sampling ^a	RDS	^a CS; RDS; SRS; TA; TLCS	CS; SB ^a ; SRS	RDS	RDS
Year of survey	2004	2005	2006	2007	2007
Sample size	400	3228	4639	500	730
Cities covered	Lahore / Karachi	Lahore / 7 other cities	Lahore / 11 other cities	Two other cities	Lahore
Reported condom use (%)	32	18	30.8 (26.4-35)/ 21.8 (20.5-23)	38.6-66.8	65 (61.5-68.4)
Mean number of sexual partners	4.9 (4.4-5.4) (per week)	4.5 (per day)	2.7 (per day) (2.6-2.7) / 2.5 (2.0-2.9)	6.2 (per week)	3.3 (per day) (2.1-4.5)
HIV infection	0.5 (0.23-1.23)	0.2	0	0	0.7 (0.68-0.71)
<i>T.pallidum</i>	16.2 (12.3-19.7)	N/A ⁶	N/A	1.2-2.8	4.5 (2.9-6.0)
<i>N. gonorrhoeae</i>	12.3 (8.4-16.2)	N/A	N/A	0.2-1.9	7.5 (5.5-9.4)
<i>C.trachomatis</i>	11.0 (7.8-14.2)	N/A	N/A	0.9-1.7	7.7 (5.7-9.6)
<i>T. vaginalis</i>	12.3 (8.4-16.2)	N/A	N/A	N/A	5.1 (3.5-6.6)

^a RDS, respondent driven sampling; CS, cluster sampling, SRS, systematic random sampling, SB, snowballing, TLCS, time location cluster sampling, TA, take anyone

⁶ N/A – not available

It appears that Pakistan may thus far have averted a heterosexual HIV epidemic, at least until 2007, as there is no evidence of any further research on women selling sex after 2007. The question is why other countries in different regions also do not have a heterosexual HIV epidemic. While analyzing the literature, it is evident that in some European countries, where there is no heterosexual HIV epidemic, the HIV epidemic is driven primarily by unprotected sex among MSMs and unsafe practices among injecting drug users (1, 131-133). In Central Asia, the HIV epidemic is mainly driven by injecting drug use (21). In Pakistan, selling sex is illegal, which is also so in many countries with low HIV prevalence among women, such as Sweden where selling sex is allowed but the purchase is prohibited (134). Street based sex work has been halved in Sweden ever since the introduction of the law in 1999. In Pakistan, on the other hand, the onus of crime of selling sex is on the woman selling sex (116). Sex work is an important factor in many of West Africa's HIV epidemics. More than one third (35%) of female sex workers surveyed in 2006 in Mali were living with HIV (Ministère de la Santé du Mali, 2006), and infection levels exceeding 20% have been documented among sex workers in Senegal (135) and Burkina Faso (136). Sex work plays an important, but less central, role in HIV transmission in southern Africa, where exceptionally high background prevalence results in substantial HIV transmission during sexual intercourse unrelated to sex work (1). This has however not been the case in other regional countries including India where the HIV prevalence among women selling sex has been reported to be between 2% and 26% (137, 138), among Nepalese trafficked women it was 43% (139) and in Thailand it was 20% (140).

From Pakistan, it is evident that there is a change in the way that women now sell sex. Brothel-based sex work and call girls, each account for the lowest proportion (1.2%), whereas street-based is the highest at 47% (107). To our knowledge, reproductive rate of HIV infection in Pakistan is not known, and furthermore the HIV incidence has not been calculated in any group of the Pakistani population. Paper II provides information on the reported network size, HIV prevalence, number of partners per day, and the proportion not using condoms during sexual contact with clients. We also know that the probability of transmission of HIV from female to male through vaginal intercourse ranges between 0.2/1000 to 0.5/1000. Since our participants were kothikhana and home-based, they would not sell sex on weekends, i.e. Sunday, during national & religious holidays and while they were menstruating. Hence, it is estimated that they would be selling sex for 235 days per year, with the assumption that they would not be pregnant. Four scenarios presented below illustrate a mathematical model while taking into consideration the reported size of network, HIV prevalence, number of partners per day, days of sex work, whether using or not using condoms and the probability of transmission from females to male by vaginal intercourse. The first scenario, A1, presents the estimated number of men that could have been infected with HIV during 2007 if the probability of female to male transmission of HIV was assumed to be 0.5/1000 and the rate of not using condoms was 35% (as in paper II). Scenario A2 presents the estimated number of men that could have been infected with HIV during 2007 if the probability of female to male transmission of HIV was assumed to be

0.2/1000 and the same rate of not using condoms of 35% from paper II is used. Scenario A3 presents the number of HIV infections prevented if the condom use rate was 65% and with zero probability of transmission expressed as “1”. Scenario A4 presents the same assumptions as scenario A3, except that if the condom use rate was 35%. The estimated figures for national and Lahore in the four scenarios are the proportionate representation of the number of women selling sex who were both home-based and kothikhana based.

Scenario A1 - Probability estimate of HIV transmission from a female to male – Vaginal intercourse =0.0005 & 35% not using condoms									
Areas	No. Of participant	Reported Network	HIV Positive	HIV Prevalence	No. of partners per day	Days of sex work	Not using condom	Probability of transmission	Estimated no. of men to be infected
All	730	5266	5	0.007	3	235	0.35	0.0005	5
A	248	2434	2	0.008	3	235	0.27	0.0005	2
B	241	1209	3	0.012	3	235	0.41	0.0005	2
C	241	1623	0	0	3	235	0.4	0.0005	0
National		84755	3	0.007	3	235	0.35	0.0005	73
Lahore		7160	3	0.007	3	235	0.35	0.0005	6

Scenario A2 - Probability estimate of HIV transmission from a female to male – Vaginal intercourse =0.0002 & 35% not using condoms									
Areas	No. Of participant	Reported Network	HIV Positive	HIV Prevalence	No. of partners per day	Days of sex work	Not using condom	Probability of transmission	Estimated no. of men to be infected with HIV
All	730	5266	5	0.007	3	235	0.35	0.0002	2
A	248	2434	2	0.008	3	235	0.27	0.0002	1
B	241	1209	3	0.012	3	235	0.41	0.0002	1
C	241	1623	0	0	3	235	0.4	0.0002	0
National		84755	3	0.007	3	235	0.35	0.0002	29
Lahore		7160	3	0.007	3	235	0.35	0.0002	2

Scenario A3 - Probability estimate of HIV transmission from a female to male – vaginal intercourse while using condom="1" and Condom use rate = 65%

Areas	No. Of participant	Reported Network	HIV Positive	HIV Prevalence	No. of partners per day	Days of sex work	Using condom	Probability of transmission	Estimated no. HIV Infections prevented
All	730	5266	5	0.007	3	235	0.65	1	16892
A	248	2434	2	0.008	3	235	0.73	1	10021
B	241	1209	3	0.012	3	235	0.59	1	6035
C	241	1623	0	0	3	235	0.6	1	0
National		84755	3	0.007	3	235	0.65	1	271873
Lahore		7160	3	0.007	3	235	0.65	1	22967

Scenario A4 - Probability estimate of HIV transmission from a female to male – vaginal intercourse while using condom="1" & condom use rate = 35%

Areas	No. Of participant	Reported Network	HIV Positive	HIV Prevalence	No. of partners per day	Days of sex work	Not using condom	Probability of transmission	Estimated no. HIV Infections prevented
All	730	5266	5	0.007	3	235	0.35	1	9096
A	248	2434	2	0.008	3	235	0.73	1	10021
B	241	1209	3	0.012	3	235	0.59	1	6035
C	241	1623	0	0	3	235	0.6	1	0
National		84755	3	0.007	3	235	0.35	1	146393
Lahore		7160	3	0.007	3	235	0.35	1	12367

The literature about network size of women selling sex in Pakistan estimates that there are about 167,500 women selling sex, 29.7% of whom are home based and 20.9% are kothikhana based (109). The research (Paper II) was conducted among home based and kothikhana based women selling sex. If we apply the same assumptions with our findings (paper II) to the estimated number of 84,755 women selling sex among home based and kothikhana based at the national level, between 29 and 73 new HIV infections could have occurred at the national level in 2007 among men having unprotected sex with women selling sex at these two venues. However, the number of HIV infections prevented due to different condom use rate of 65% to 35% would range between 146,393 to 271,873 at the national level. In our network of women selling sex, the number of HIV infections prevented ranges between 9,096 and 16,892. These have direct economic implications. To our knowledge, there is no information available on the cost effectiveness and DALYs prevented by the services package instituted for women selling sex in Pakistan by the Ministry of Health. Globally, there is also limited information available on costs and effectiveness of interventions to inform policy planners working on HIV and STI programmes (141). However, In Nairobi, a programme of STD control and condom promotion was able to prevent between 8,000 and 10,000 new cases of HIV infections per year at the modest program cost of between US\$ 8 and US\$ 12 per HIV infection averted (142). A study assessing an STI program for women selling sex in Johannesburg, South Africa, estimated that the intervention covering condom distribution, treatment of symptomatic STIs and periodic presumptive treatment (PPT) averted US\$ 2,093 (range, US\$ 1,384-3,635) per HIV infections and US\$ 78 per DALY (143). A modelling exercise for the whole African continent for HIV prevention through STI treatment interventions demonstrated the potential to save 291 million life years, while averting 13 million infections at a cost of around US\$ 78 per infection (144). Another epidemiological model, which simulated the HIV epidemic in four different settings in West and East Africa, found the cost per HIV infection averted to range between US\$ 321 - 1,665 (145).

To our knowledge, there has been no new research on HIV prevalence among women selling sex after our studies in Pakistan. Despite the fact that women selling sex are the largest group (55%) of MARPs in Pakistan (109), the National AIDS Control Programme of Pakistan omitted women selling sex from the annual IBBS, citing the reason of consistent finding of low sero-prevalence (106).

5.3 Antimicrobial Resistance

Antimicrobial resistance is a daunting challenge for global public health. Factors that influence antimicrobial resistance include inadequate access to drugs, quality of drugs, overuse and misuse of drugs, sub-optimally functioning and poorly responsive health care systems, lack of knowledge on behalf of both the service provider and the client, conflicts, and bad governance (146). In the case of *N. gonorrhoeae*, the first choice drug has been ciprofloxacin, which is a second-generation synthetic chemotherapeutic antibiotic of the fluoroquinolone drug class.

The National Guidelines of Pakistan for the management of STIs still recommends ciprofloxacin as the choice of drug for the treatment of *N. gonorrhoeae* (124). Despite the limited number of strains examined, our research indicates a high (76%) resistance of *N. gonorrhoeae* in a most at risk population. Another study in Pakistan conducted over 10 years in a tertiary care setting found a 42% prevalence of quinolone resistance in *N. gonorrhoeae* (147). In Bangladesh, the reported ciprofloxacin resistance of *N. gonorrhoeae* was 27% (148), whereas in India resistance to ciprofloxacin was 36% (149). In Bali, Indonesia, the resistance to ciprofloxacin was 59% (150). The incidence of quinolone resistance was reported to be 99% in Hong Kong, 99% in China, 97% in Lao PDR, 92% in Japan, 88% in Korea and 84% in Vietnam (151, 152). Nowadays, quinolones are not recommended to be the drug of choice for treatment of *N. gonorrhoeae*. The new recommended drug is ceftriaxone (third generation cephalosporin), with azithromycin as an alternate (53, 153, 154).

5.4 To use or not to use condoms

Unprotected sexual intercourse renders the woman selling sex, as well as her client, susceptible to STIs and HIV. Women selling sex in our research spoke about resistance by the client to use condoms, as it reduced the pleasure, and also that it drove away clients. They further mentioned that healthy looking clients did not pose any threat of infecting them with either STIs or HIV. Basuki in Indonesia (155) cites the client's perspective, which was narrated to be perceived less pleasure, but acquaintance with the sex worker, renders them less vulnerable to STIs and HIV. The women selling sex in the same study believed that boyfriends, native Indonesians, healthy looking clients, and taking antibiotics, did not place them at risk of getting infected with either STIs or HIV. The dynamics of consistent condom use as described by Oladosu (156) include negotiations to use condom even after the client offered more money for unprotected sex, self-efficacy of discussing condom use before the sexual intercourse, and use of condoms for prevention of pregnancy or STIs in addition to HIV prevention. Such skills were cited to have a positive outcome of consistent condom use (156). Furthermore, barriers identified for not using condoms include gaps in knowledge about the range of available methods, misinformation and negative perceptions about methods, and concern about resistance by the male clients (157, 158). However, a meta-analysis of behaviours and actions suggests that negotiations for condom use are influenced by intentions, attitudes and beliefs (159).

However, condom use has also been affected by religious decrees, developmental agendas as in President's Emergency Plan for AIDS Relief (PEPFAR) and the mix of ideological, political and theological thought processes (160).

5.5 Economical Transactions

With a reported network size of women selling sex of 5226 (Paper II), who were selling sex for 235 days to a median of 3 clients per day and charging a median of Rs. 250 per client, it can be conservatively estimated that the economical transaction among the women selling sex in our research was Rs. 921 million (€ 7.26 million – Pak Rupee 1 = € 0.00789) during the year 2007. When the same assumptions are applied on 84,755 women selling sex in 2007 (the estimated national estimates of number of women selling sex who are either home-based and kothikhana based), the economical transaction was estimated to Rs. 14.93 billion (€117.86 million). This amount is 1.2 times higher than the federal health budget of Pakistan in the same fiscal year.

On average, a housemaid in Pakistan earns between Rs. 5000 to 6000 (€47.34) per month. A woman selling sex in our research was earning Rs. 15000 per month, which is about three folds higher, if she were to work as a housemaid. Earning 5000 rupees per month seems to be five times higher than the national poverty line of Rs. 949 as measured in Pakistan in 2005-06. However, with a total fertility rate of 4.1, and an assumption that equal distribution of money earned by a female is taking place among her family members, subject to that there is no other means of support by husband or family, each member is thereby living on the poverty line. However, women selling sex make a living above the poverty line. In economical terms, an average housemaid is three times worse when it comes to income generation. The choice is hard, yet pays off well to survive economically. This further requires elaboration and research to assess the economic transactions at national level, which are tax free, not accounted for versus the social cost of selling sex.

5.6 Network Interactions

The understanding that concentrated epidemics tend to be self-contained is not supported by available information from Pakistan or elsewhere. In Pakistan, according to the second generation HIV surveillance, in 12 cities of Pakistan, 22.2% of the IDUs have an overall HIV prevalence of 15.8% (95% CI: 14.7-16.9; range 1-53%) (105) increasing from 10.8% (95% CI: 9.6%-12.1%) (102) bought sex from women selling sex six months preceding the survey in 2006-07 as compared to 7.5% in 2005. Another study shows a further increase in HIV prevalence among IDUs rising up to 20.8% (95% CI: 19.4-22.3) in eight major cities of Pakistan, including Lahore (106). An additional 13.9% IDUs paid male sex workers or Hijra sex workers in 2008 as compared with 13.2% and 9.3% in 2006-07 and 2005 respectively. In 2005, 12.6% IDUs from eight cities bought sex from women selling sex, which increased to 22.2% a year later. The condom use by IDUs in contacts with women selling sex has also reduced from 25% (2005) to 16.6% (2006-07). However, in Lahore, during 2005, 26% of IDUs reported having paid women selling sex as compared to 21.6% in 2006-07 (Figure 3 and 4).

Figure 3 Interaction between IDUs, women selling sex, MSM, and Hijra population in 8 cities of Pakistan - 2005

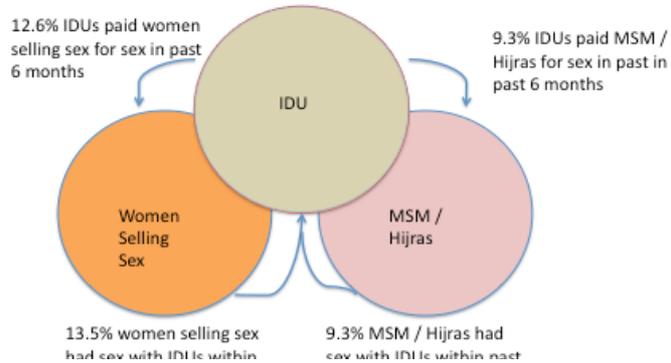
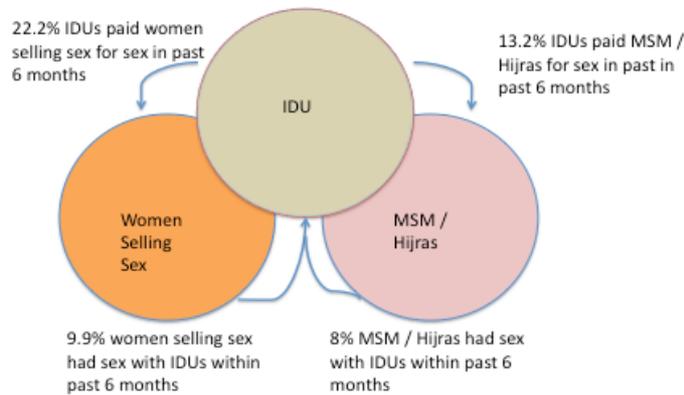


Figure 4. Interaction between IDUs, women selling sex, MSM, and Hijra population in 12 cities of Pakistan - 2006-07



Approximately 46% of the IDUs had regular female sexual partners as well, thus placing themselves as carriers and transmitters of infections to both paid irregular and unpaid regular female partners. As many IDUs also have sex with both male and female partners, this bisexual practice places them at an even greater risk. This networking is a perfect recipe for a potential HIV outbreak among women selling sex and the general population of Pakistan. In Senegal, 82% of surveyed MSM, who contributed to 20% of total new HIV infections, claimed having sex with females (8). Likewise in Malawi, 33% of the MSM claimed to be cohabiting with women (15, 161). The Asian epidemic is also compounded by bisexual behaviours among men, which suggests that a significant proportion of men who have sex with men also have sex with women (15, 162).

5.7 Health-seeking behaviour

The health-seeking behaviour of women selling sex in our research was influenced by their knowledge, attitude, capacity to pay for the services, and also the choices available to them. More than half of our participants sought health care from the private sector health care providers, as they were more accessible and provided confidential services. In China, private sector health care providers were the major source of

seeking health care (162, 163). However, only 28% of our participants went to seek treatment, the remainder citing inability to afford treatment, and their belief that their condition had improved over time. The determinants for health care seeking behaviour vary among different geographical locations and their particular social contexts. These include knowledge, attitude, sexual practices, perceived severity of the STI, self-treatment prior to seeking health care, lack of time and money, and autonomy to decide when, where and from whom to seek health care (164-167). Delayed health-seeking behaviour due to either non-affordability or non-availability of health care provider can lead to an increase in the burden of disease and pose a threat for an increased level of transmission of STIs (168). Health-seeking behaviour remains a major source for quick appraisal of a health issue in a given time, yet it has not been used to engage populations at risk with development of health systems (169).

In our research with HCPs (Paper IV), 82% were not aware of syndromic management of STIs. An earlier study in Pakistan found that almost three quarters of the HCPs were not aware of syndromic management (170). Among our study participants, only 10% could cite the correct treatment of gonorrhoea, syphilis and vaginal discharge. An earlier study found a much higher level of knowledge, with 46% of HCPs knowing the correct treatment (171, 172). Eighteen percent cited their apprehension and fear of treating patients with HIV and STIs, which was almost the same figure as when medical students were surveyed (172). Whereas 21% of our participants claimed to have seen a patient with advanced HIV infection, only two HCPs were trained to manage a case of advanced HIV infection. Over the years, the management of HIV infection from primary care to specialized tertiary care has limited the access to health care. The increased availability of ARV leading to long surviving populations, who encounter multiple morbidities, questions such a model of service delivery (173). With only four million PLHIV receiving ARV treatment, compared to the 13 million in need, the real challenge is not only to provide ARV, but to have HCPs managing treatments, in conjunction with community support (173, 174).

Kielmann's analytical model provides a framework to explore the health problems and determine the health needs of the community, expressed as felt and normative needs. It also explains the influencing factors of inputs, processes, outputs, outcomes, management and organization, and the overarching policy influences. However, behaviour to seek support is dependent upon factors that influence the intent of the person. These include whether the person is even considering or not a change of his or her behaviour, followed by the decision and commitment to make change, taking action and maintenance/maintaining, as explained in Prochaska's stages of change model. However, social behaviours are also influenced by families, communities, societal forces, economic space and policies (175). Measures taken to prevent heterosexual HIV transmission are influenced by gender power relationships and the cultural subscriptions of the males' expressed claim and influence to be able to buy sex (176, 177). However, a safe sexual behaviour, irrespective of the gender differential, is dependent upon awareness, liberation to make informed choices, and self re-evaluation

(178). Furthermore, an analysis using the theory of planned behaviour indicates that there is an 11% variance in reported behaviours as compared to the observed behaviour while using condoms (179).

5.8 The health systems preparedness and response

Pakistan's HIV epidemic faces multiple risks, which puts the country at a substantial risk of witnessing a full-blown HIV epidemic. These include, among others, low levels of literacy and health awareness (123); widely prevalent myths and misconceptions regarding HIV/AIDS and STIs owing to generalized stigma attached (180); substantial number of drug dependents and rapid shifts from traditional opiate smoking to injecting drug (106); existence of well-organized and established sex industries operating in all economic centres of the country, often denied by the authorities; absence of organized blood transfusion services (181); high proportion of unsafe injection practices (182); and Pakistani women in general having lower socioeconomic status, less mobility and less decision-making power than men, all of which contributes to their HIV vulnerability.

The allocation for health is less than one percent of the GDP (123) and HIV is not on the priority list of the National Health Policy (121). The allocation of resources for HIV in Pakistan is not based on technical issues but from a complex interplay of political and bureaucratic judgments (183). External funding has been the major source of financing HIV interventions in Pakistan, as the disbursement mechanisms are less cumbersome and involve less of the red tapism. Political influences are thought to effect resource distribution in spite of well laid down procedures and plans which determine allocation of public resources. There is an absolute lack of technical expertise and hence decisions are made on ad hoc basis to fulfil demands and responses of donors and the political hierarchy (184). The enhanced HIV response in Pakistan is financed by the Global Fund, amounting to approximately US\$ 43 million for the next five years, with minimal financing from the public side. UNAIDS has introduced the Domestic Investment Priority Index (DIPI), which attempts to measure the extent of investment priority given by governments to support their national AIDS response, and a high level indicates a high level of priority. The DIPI for Pakistan is 0.02, which is much lower than the median level of 0.35 of 104 countries reporting on this index. This implies that the allocation for an enhanced HIV response is far less than what is required. Resource allocation has remained a global challenge in the health sector due to low allocations, migration of human resources, donor involvement, and low levels of commitment for ensuring resource availability (185). A critical issue that is questioned is not only the public sector allocation, but also the role of donors in aid coordination and aid effectiveness. Hence the challenge remains to address how quickly the response can chart a new course towards UNAIDS' vision of zero discrimination, zero new HIV infections, and zero AIDS-related deaths through universal access to effective HIV prevention, treatment, care and support.

5.9 Methodological considerations

The research involved both qualitative (paper I) and quantitative research methods (papers II, III, IV).

In paper I, in depth interviews were conducted. The analysis method was content analysis, which enabled us to include large amounts of textual information. The software programme Open Code was used in coding. To ensure trustworthiness, we undertook various procedures such as peer review and methods to ensure investigator triangulation to capture the multiple realities of the women. The research team composition was diverse and rich in qualitative research methodology experience, and hence brought in several perspectives, which ensured interpretation in its entirety. The research involved exploring sensitive issues related to sexuality, sexual behaviours and practices. Given the cultural constraint of a male to female interaction for discussion on sensitive issues like sex and HIV, three female enumerators were trained. As the interviews were not recorded, some important information may have been missed out while transcribing the detailed notes.

Likewise in paper II and III, the data collection was overseen by the author of the thesis, but the enumerators were female public health nurses due to the same cultural restriction of engaging on data collection by a male from a female on issues related to sexuality. The training for collection of biological samples was imparted to three female doctors. However, due to the stigma towards women selling sex, one of the female doctors was denied permission by her parents to further take part in the research. Her role was then taken over by a female public health nurse with extensive clinical and research background. Given the variance in the educational qualification, level and extent of training between doctors and the public health nurse, a bias may have been introduced. We used RDS to recruit women selling sex and we achieved our sample size without a break in the chain until wave five. This was possible due to the high number of women selling sex that were willing to participate in return for the free medical examination, free laboratory tests and most important the double incentive system. Recruitment was also facilitated by the methodology of approaching the women selling sex, through the clinics working in their areas and offering STI clinical and preventive services for over three years preceding the survey. The number of waves required to reach equilibrium is dependent upon homophily and also on the variable of interest. When the network homophily is strong, equilibrium is stated to be attained slowly as compared with when the homophily is moderate or weak (186). The research leading to Paper II reached equilibrium in wave five as a moderate level of homophily was observed, and the two age groups that we studied were recruiting between 43% to 50% among each other. A review of 123 studies indicate that an average of nine waves were undertaken to achieve the sample size. However, this was 100% achieved in IDU subgroups, 97% in sex workers and 94% in MSM populations. Further analysis also shows that 21% of all IDU studies, 18% of MSM studies and 13% of sex worker studies conducted had achieved their required sample size in less than 6 waves (187). Network size reporting is influenced by gender, and evidence suggests that the MSM

population introduces this bias due to the cultural context and hence not giving the correct estimates, as MSM tend to recruit their own clients, whereas women selling sex recruit their own colleagues in their networks (188). We used the RDS analysis tool to estimate the transition probability, adjusted mean network size and homophily, and SPSS to analyze the remaining data. We reviewed the available 283 articles in the Medline database and found that authors during their analysis have used RDSAT and other statistical software. Previous studies conducted among women selling sex in Pakistan have used various sampling methods including RDS, cluster sampling, systematic random sampling and snowballing simultaneously to recruit women selling sex working under different conditions (www.nacp.gov.pk). Paper II followed the principles of RDS irrespective of the typology of the women selling sex in Pakistan. Furthermore, paper II had almost double the number of participants than other studies conducted in Pakistan.

Paper III and IV also involved collection of information by assessing the knowledge, attitude and practices. Although it has produced in our case data to quantify and the responses, and to determine the magnitude of the issues and challenges, it is important to note that the validity of this method has been questioned (189). However, in our study the expected patterns of social and sexual behaviours were concordant with qualitative information collected earlier.

The participants in paper IV were health care providers from the private and public sector. There was a sampling frame available for the private sector providers, from which universal sampling was done. However, due to administrative reasons, the sampling frame was not available for the public sector and hence the doctors on duty on the day of the visit were interviewed.

Four tiers of field monitoring were designed to oversee the quality of data collection. Ten percent of all quantitative questionnaires administered in Paper II, III and IV were validated by the field manager, who had extensive experience in quantitative research methodology and field monitoring.

The whole research team was actively involved in the design and quality assurance of the studies. The author of the thesis exclusively managed all data sets, which included formulation of the study questionnaires (with the help of the supervisors), overseeing data collection, data entry, data cleaning, and analysis. This helped to standardize the process of data management and to secure confidentiality.

5.10 Conclusions

1. There is now an established social behaviour change whereby poverty of opportunity is leading women and girls to sell sex to survive or to move up in the society;
2. The institutional setup of selling sex has changed from the more traditional brothel-based to street-based, home-based or kothikhana-based typology;
3. Level of knowledge about HIV and STI among women selling sex remains low;
4. Pakistan may have avoided a heterosexual HIV epidemic so far, as the HIV prevalence recorded in our research and by others among women selling sex has shown that it remains at less than 1% in adults. This may be attributed to a high self-reported condom use, low levels of STIs, relatively low number of sexual partners, or a market driven supply demand phenomenon;
5. Health seeking behaviour is primarily influenced by accessibility and ability to pay;
6. Health care providers in both the private and the public sector do not have the optimal level of correct knowledge, appropriate attitudes nor the skills to manage a patient with HIV infection or STIs;
7. The law addressing women and selling sex is discriminatory towards women; and
8. The health sector preparedness and response to the HIV / STI epidemic in Pakistan is sub-optimally ready to address the objectives laid down in the WHO 2000 report i.e. (a) Improve health status; (b) fair financing; and (c) responsiveness to clients.

5.11 Recommendations

1. Based on the findings of our research, it would be imperative to further explore the magnitude and severity of income poverty, and the social policy related to women selling sex, and to question whether selling sex is the only option left for survival;
2. The changing typology of women selling sex seeks further exploration, especially among the street based women selling sex;
3. Future behaviour change communication initiatives need to address knowledge about HIV and STIs, not only on enhancing information to bring about a positive behaviour modification and change towards the same;
4. Due to availability of antiretroviral medication, the HIV surveillance strategy in Pakistan needs to be revisited by estimating and following up on assessing the incidence, rather than prevalence, of HIV along with behaviour patterns to determine the trend and place in appropriate responses;
5. Further research is required to determine the antimicrobial resistance of *N. gonorrhoeae* and it may be prudent to revisit National STI management protocols;
6. Healthcare providers' training should be an on-going process, and should be linked with the BCC campaign through a social marketing initiative;
7. Funding for HIV and STI epidemics need to be enhanced out of public sector resources to show commitment and solicit future international contributions.

6. Epilogue

Every morning when I wake up, I have two choices, either to go to sleep and continue to dream or get out of bed and chase my dreams. I always choose to chase my dreams. Dreams have been part of my life, from the time I was introduced to my memory.

Very recently, I asked myself “Mohsin! What have you learnt in these years while you were linked with Karolinska Institutet and now you are heading to see your dream come true – to have a Doctorate”. I gave myself the answers of knowledge, inspiration, growing up?, patience, skill development but then it dawned upon me that I had absorbed the skills to reason and to think logically. Was all this research, all these courses, all of this, was it worth it. Will I do it again? “Yes”, the answer came – “a thousand times over”.

Albert Einstein once said, “The problems we face can not be solved by the same level of thinking that created them”. These women, whom we interviewed, are still there entangled in the web. Is research about publications? No, it is about making a difference by bringing smiles to the lives of so many out there. Reaching out is not a philosophy but a reality. We need to expand our scope of work, step out of our comfort zones, and share our love and not only knowledge with the people who need us. Our love and knowledge together with their experiences will become the light they need to make their own decisions.

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9. Appendices

Appendix A

Question Guide for Study 1

I (name) am working in a research project in collaboration with the Contech International Health Consultants. We are trying to find out what do people think of health. We need to ask you some very personal questions. Nothing you tell me will be used for anything but the purposes of this survey. Your name or address will never be written down. You can refuse without any problem and you can stop the interview at any time after we start. What you tell me will be kept strictly confidential. Because we sincerely want to help all the people of Pakistan, if you agree to give the interview, it is really important that you are willing to be very truthful. Is it all right to begin?

Name of the location: _____

Did the interviewee abandon the interview: Yes (Precise the question number): Q - - -
 No

Interviewer:

Date Interview: ___/___/2005

Checked by the supervisor: Signature _____

Date: - - / - - / 2007

Appendix A

Domain:

Concepts

S. No

Variable

1. Problems of Life
2. Health Problems
3. Treatment seeking behavior

Questions & Probes

- 1) Do you face any problems in your life
- 2) If yes, can you please explain in more detail?
- 3) Do you have any health problems?
 - If yes, please explain in more detail?
- 4) What is sickness?
- 5) When you get sick what do you do?
- 6) If the answer is "seek treatment", ask for what type of treatment does she seek?
- 7) Ask where does she go for treatment?
- 8) Does she make the decision herself or someone else makes the decision for her to seek health?
- 9) How much time does it take for her to decide and seek treatment?
- 10) If the treatment seeking is more than one day, then probe for reasons for delay?
 - 11) Which health care provider do you go to seek treatment?
 - 12) Why do you go to this health care provider?
 - Probe if she goes to other health care providers and if so why and at what stage of disease?
 - 13) What are STI?
 - 14) How does one get STIs?
 - 15) Did you ever have STIs?
 - 16) What do you do when you have STIs?
 - 17) 16) What do you call STIs?
 - 18) If you have STI, does it affect you work?
 - 19) How can one prevent oneself from getting STIs?
 - 20) What are condoms?
- 21) What do you think are medicine?
- 22) What do they do?
- 23) How does medicine work?
- 24) Why does some medicine work at times and sometime does not?

Appendix A

Domain:

Concepts

S. No

Variable

1. Types

Clients;

2. Service

charges

3. **Condoms**

Questions & Probes

of 25) What kinds of clients visit you?

- Probe for age;
- Probe for profession;
- 26) Do you have female clients?
- 27) How much do you charge for your work?
- 28) ARE the charges different for different services?
 - If yes then why?
 - If yes, the why?
- 29) Are the charges different for different clients?

30) What do you think condoms are used for?

31) Do you ask your clients to use condoms?

- If the answer is "yes", ask whether condoms are used every time or sometimes?
- Probe for how does she convince her clients for using condoms?
- Probe for why condoms are not used regularly?
- If the response is that condoms reduce pleasure, then ask whether it is her pleasure or her client's pleasure?
- 32) From where does she get condoms?
 - If the condoms are not available, then probe for reasons for non availability?

Appendix A

Domain:

Concepts

S. No

Variable

1. Social networks

hierarchy;

2. Reasons for sex work;

3. Place of origin;

Questions & Probes

33) How many girls / women you know who are in the same type of work that you are?

34) How do your clients know where to contact you?

35) How do they contact you?

36) Since when are you doing this work?

37) Why are you doing this work?

38) From where are you from?

39) How did you end up here?

Questionnaire identification number

--

Sub Study 2
KAP – FSW

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Respondent ID:

S. No	Question	Response		
1	Date of Interview	Month	Day	Year
2	Last Name			
3	First Name			
4	Mother's Maiden Name			
5	Where were you born (Birthplace)			
6	Interview Language	Urdu		
7.	Sex	Female		
Biometrics				
9a.	Birthday	Month	Day	Year
9b.	What is your age?			
10.	Religion 1=Islam 2=Christianity 3=Hinduism 4=Others Specify _____			
11.	Ethnicity 1=Shia 2=Sunni 3=Others (Specify _____)			
12.	Identification Mark			
13.	Address of the respondent			

Section 1: Background Characteristics

No.	Questions and filters	Coding categories	Skip to	Response
101.	What is your education level?	No School 1 Primary 2 Middle 3 Matric 4 Inter 5 Graduate 6 Others 7		
102	Are you married?	Specify Single 1 Engaged 2 Married 3 Divorced 4 Separated 5 Widow 6 Others 7 (specify _____)	105 105	
103	Do you have children?	Yes 1 No 2	105	
104.	How many children do you have?	Number _____ Males _____ Females _____		
105.	Have you donated blood in the past 12 months?	Yes 1 No 2 Don't Know 3		
106	Did you charge money for the donating blood?	Yes 1 No 2 Don't Remember 3		
107.	Some people take drugs for addiction. Do you take something or drugs for addiction?	Yes 1 No 2 Don't know 3		

108	What do you take for addiction?	Smoke cigarettes 1 Smoke Hash 2 Smoke heroin 3 Drink Alcohol 4 Inject Drugs 5 Others 6		
109.	Some people inject drugs. Have you injected drugs in the last 12 months?	Specify _____ Yes 1 No 2 Don't Know 3	201	
110	If yes then what did you inject?			
111	Did you share the needle / syringe with someone else at the time of injecting drugs?	Yes 1 No 2 Don't Remember 3		
112	If yes, then with whom?			

Section 2: Sexual History

No.	Questions and filters	Coding categories	Skip to	Response
201	How long have you been in sex business?			
202	Why did you start to work in sex business?			
203	Why are you in sex business?			
204	At what age did you first have sexual intercourse?	Age in Years ____		
205	How long have you been in this brothel?	Years-----		
206	How many clients do you have in a day?			

207	Who are your clients? Multiple answers apply	Rich 1 Poor 2 Students 3 Religious Leaders 4 Business men 5 Women 6 Doctors 7 Politicians 8 Police 9 Others 10 Specify _____	
208	Do you have women as your clients?	Yes 1 No 2	
209	Network Size (how many girls / women you know who are in the sex business?)		

Section 3: Information regarding condom & contraceptives

No.	Questions and Filters	Coding categories	Skip to	Response
301.	What contraceptive methods are you currently using? (can choose many)	Intra Uterus Device 1 Condom 2 Calender/mucus method 3 Withdrawal 4 Contraceptive pill 5 Female sterilization 6 None 7 Others 8 Specify _____		
302.	Which places or persons can you obtain condoms?	Shop1 Pharmacy2 Health facility3 Hotel4 Friends5 Clients6 Pimps7 NGO worker8 Contech Clinic9 Other 10 Specify _____		
303.	Can you obtain a condom every time you need one?	Yes1 No2	→ 305	
304	Why can't you get a condom every time you need one?	Cost too much1 Shop/pharmacy too far away2 Shops pharmacy closed3 Shy to buy condom4 Don't know where to obtain5 Don't want to carry them6 Other ...7 Specify _____		
305	Do you use a condom with your clients?	Always .1 Sometimes .2 Never .3	→ 307 → 307	

306	Why do you use a condom with your clients?	To avoid pregnancy1 To avoid STIs.....2 To avoid AIDS3 Others4 Specify _____	
307	Why don't you use a condom?	Don't like it1 Don't need to as I am taking pills.....2 Reduces my sexual pleasure3 Clients don't like it4 Never thought of it ...5 Bad for my health6 Others7 specify _____	

Section 4: STIs

No.	Questions and filters	Coding categories	Skip to	Response
401	Do you think it is common to have a vaginal discharge?	Yes 1 No 2 Do not Know 3 Others 4 Specify _____		
402	How would you define vaginal discharge as being abnormal? (Multiple answers apply)	Greater amount than usual 1 Odor 2 Change of color: yellow or green 3 Powdery liquid 4 Foamy liquid 5 Blood-stained liquid 6 Don't know 7 Other 8 specify _____		
403	Do you know what are symptoms of STIs? (Multiple answers apply)	Abnormal vaginal discharge1 Urethral discharge (male)2 Genital ulcers3 Genital warts4 Genital itching5 Pain during urination 6 Pain during sexual intercourse7 Lower abdominal pain 8 Don't know 9 Others 10 Specify _____		
404	Can STIs transmit?	Yes 1 No 2 Don't know 3	→407	
405	If yes, how are STIs transmitted? (can choose many)	Sexual intercourse 1 Blood transfusion 2 Sharing needles 3 Mother to child 4 Sharing clothes 5 Germs 6 Using the same toilet 7 Don't know 6 Others 7 specify _____		

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406	What are complications of STIs if untreated?	Infertility 1 Ectopic pregnancy 2 Cervical cancer 3 Premature birth 4 Miscarriage 5 Still birth 6 Others 7 specify _____		
407	Did you ever have any "STI" during your life?	Yes 1 No 2 Do not know 3		
408	Have you had any of the following symptoms in the last 6 months?			
A	Abnormal vaginal discharge	Yes 1 No 2		
B	Genital itching	Yes 1 No 2		
C	Dysuria (pain during urination)	Yes 1 No 2		
D	Dyspareunia (pain during intercourse)	Yes 1 No 2		
E	Bleeding after sexual intercourse	Yes 1 NO 2		

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F	Sores/ warts in the vagina, anus	Yes 1 No 2		
G	Lower abdominal pain	Yes 1 No 2		
IF NOT TO ALL GO TO 601				
409	Did you take any health care action because of these symptom(s)?	Yes 1 No 2	→ 412	
410	If not, what is (are) reason (s)? <i>multiple answers apply</i> AFTER FILLING UP 511 SKIP TO 601	It is shameful 1 Unworthy of medical attention 2 Fear of RTI/STI diagnosis 3 Lack of money 4 Living far away the health facilities 5 Mistrust of health facilities 6 Fear of conflict with husband/partner 7 Negative attitudes of health staff 8 Others 9		
411	Which was the first place that you looked for examination or treatment?(choose one)	Private Doctor 1 LHV 2 Hakim 3 Homepath doctor 4 Medical store 5 District hospital 6 Others 7 Specify _____		

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412	Why did you choose that place as the first one for treatment? <i>(can choose many)</i>	Confidentiality 1 Convenient to reach 2 Skilled provider 3 Friendly provider 4 Cheap/Free of charge 5 Recommended by friends/relatives 6 Good equipment 7 Service available as desired 8 Others 9 Specify _____	
413	What was the diagnosis made by the person/health facility, which was consulted?		
414	What kind of treatment did you get?		

	Types of drugs	Name of drugs	Ways of using	dose/day	Duration
Example	Tablet	Nystatin	Insertion	1 tab	6
1					
2					
3					
4					
5					

415	Has it been any time that you took antibiotics / drugs and they did not cure you?	Yes 1 No 2	
416	Why do you think drugs don't work?		

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417	Did you follow the recommended doses?	Yes 1 No 2	
418	Did you follow the recommended duration?	Yes 1 No 2	
419	If no, why? <i>(can choose many)</i>	Forgot 1 It was a mild disease 2 Could not afford the medication 3 Had adverse effects 4 Condition improved 5 Others 6 Specify _____	
420	How did you feel after the treatment?	Cured 1 Same as before 2 Better but wasn't cured 3 Worse 4 Others 5 Specify _____	
421	When the symptoms were not cured what did you do?	Go to see the same provider/facility1 Prolong using the same medicines with the same doses2 Use the same medicines but increase the dose3 Change to other stronger drugs4 Go to see another provider / facility5 Others6 Specify _____	
422	What do you call STIs in your language?		
423	Approximately, how much did it cost you when you got the STIs treated?		

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424	Did you ever get pregnant in your life?	Yes 1 No 2	→ 501	
425	How many times did you get pregnant?			
426	How many times did you get the pregnancy aborted?			

Section 5: AIDS knowledge, risk and avoidance

No.	Questions and filters	Coding categories	Skip to	Response
501.	Have you ever heard of HIV?	Yes 1 No 2 Others 3 Specify _____		
502	Have you heard of the disease called AIDS?	Yes 1 No 2 Others 3 Specify _____	If no to both 501 and 502, Finish Interview	
503	Do you know the difference between HIV and AIDS?	Yes 1 No 2 Others 3 Specify _____	→ 504	
504	What is the difference?	HIV is a germ causing AIDS 1 AIDS is the disease 2 Others 3 specify _____		

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505.	Can AIDS Transmit from one person to another?	Yes.....1 No.....2 Do not know.....3 Others.....4 Specify _____		
506.	How do you think AIDS spreads from one person to another? Multiple answers apply (Do not probe)	By having sex with men.....1 By having sex with women ..2 By having vaginal sex3 By having anal sex4 By injecting drugs5 From mother's breast milk ..6 From mother to child7 Mosquito bite8 By using reused blades9 By transfusion of infected blood and blood products..10 Others11 (specify _____)		
507.	How do you think AIDS spreads from one person to another? (Probe for answers not given above)	By having sex with men.....1 By having sex with women ..2 By having vaginal sex3 By having anal sex4 By injecting drugs5 From mother's breast milk ..6 From mother to child7 Mosquito bite8 By using reused blades9 By transfusion of infected blood and blood products..10 Others11 (specify _____)		
508.	How do you think AIDS does not spread? Multiple answers apply (Do not probe)	By eating in the same utensils 1 By kissing 2 By hugging 3 By swimming 4 By talking to each other 5 Others 6 Specify _____		
509.	How do you think AIDS does not spread? (Probe for answers not given above)	By eating in the same utensils 1 By kissing 2 By hugging 3 By swimming 4 By talking to each other 5 Others 6 Specify _____		

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510.	How do you think AIDS can be prevented? Multiple answers apply (Do not probe)	By using condoms 1 By not having sex 2 By shaking hands 3 By transfusion of screened blood; 4 By using new syringes; 5 Avoiding mosquito bites. 6 Others 7 Specify _____	
511	How do you think AIDS can be prevented? (Probe for answers not given above)	By using condoms 1 By not having sex 2 By shaking hands 3 By transfusion of screened blood; 4 By using new syringes; 5 Avoiding mosquito bites. 6 Others 7 Specify _____	
512	How do you think AIDS does not spread?	By eating in the same utensils 1 By kissing 2 By hugging 3 By swimming 4 By talking to each other 5 Others 6 Specify _____	
513.	Do you think you can tell by looking at someone whether that person has AIDS?	Yes 1 No 2 Others 3 Specify _____	
514.	Do you think you are at risk of getting infected with AIDS?	Yes 1 No 2 Others 3 Specify _____	→ 515
515.	If yes then why?	High risk job1 Frequent anal sex2 Non use of condoms.....3 Injections sharing.....4 Others 5 Specify _____	
516	If no then why?	Always use condoms1 Partners are clean2 Do not have sex with foreigners.....3 Others 4 Specify _____	
517.	Do you know anywhere you could go to get an HIV test?	Yes 1 No 2 Specify _____	

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		Specify _____	Others 3 _____
518.	I don't want to know the result, but have you ever had an HIV test?	Specify _____	Yes 1 No 2 Others 3 _____
519.	Please do not tell me the result, but did you yourself find out the result of your test?	Specify _____	Yes 1 No 2 _____
520	One last question, how much do you charge per client?		
521	Are the rates different for different services?		

Thank you for your candid responses

**Sub Study 3
KAP on STI/HIV among Health Care Providers**

Serial Number	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Date:	Day <input type="text"/>	Month <input type="text"/>	Year <input type="text"/>	<input type="text"/>
Center Code:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Service delivery outlet 1. Green Star Service Outlet; 2. Public Sector Hospital; 3. Private sector service provider; 4. Others (specify _____)	<input type="text"/>			
Name of the Service Provider:	<input type="text"/>			
Address of the service provider / Name of hospital:	<input type="text"/>			
Name of the Unit 1=Medicine 2=Obstetrics / Gynecology 3=Dermatology	<input type="text"/>			

Q. NO.	Question	Response				
1.	<p>Designation of Service Provider</p> <p>1=Medical Officer 2=Registrar 3=Assistant Professor 4=Associate Professor 5=Professor 6=LHV 7=Hakim 8=Chemist 9=Registrar 10=Others Specify _____</p>					
2.	What is your age?					
3.	<p>Sex of Service Provider</p> <p>1= Male 2= Female</p>					
4.	<p>What is your educational qualification? also indicate the years of training</p> <p>1=MBBS; 2=MBBS + post-graduation (specify post-graduation) 3=MBBS + Postgraduate student 4=LHV Training 5=Hakim 6=Pharmacist 7=Chemist 8=Others Specify _____</p>	<table border="1"> <thead> <tr> <th>Educational Qualification Code</th> <th>Years of training</th> </tr> </thead> <tbody> <tr> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </tbody> </table>	Educational Qualification Code	Years of training	<input type="text"/>	<input type="text"/>
Educational Qualification Code	Years of training					
<input type="text"/>	<input type="text"/>					
5.	Can you please tell me what are Sexually Transmitted Infections?					

<p>6.</p>	<p>Can you please name some STIs that you are aware of? (Multiple answers apply)</p> <ol style="list-style-type: none"> 1. HIV; 2. AIDS; 3. Syphilis; 4. Gonorrhea; 5. Trichomonas vaginalis; 6. Chlamydia 7. Herpes 8. Others Specify _____ 	
<p>7.</p>	<p>How do you think STIs are transmitted? (Multiple answers apply)</p> <ol style="list-style-type: none"> 1=Sexual intercourse without condom 2=Sexual intercourse 3=Blood transfusion 4=transfusion of unscreened blood 5=Mother to child 6=Oral sex 7=Sharing toilet; 8=Sharing food 7=Others <p>Specify _____</p>	
<p>8.</p>	<p>Do you think that STIs can be prevented? If No then skip to Q10</p> <p>1=yes 2=no</p>	

<p>9.</p>	<p>How do you think STIs can be prevented?</p> <ol style="list-style-type: none"> 1. Use of condoms; 2. Transfusion of screened blood; 3. Abstinence from Sex; 4. Couples being faithful with each other 5. Others <p>Specify _____</p>																	
<p>10.</p>	<p>How many cases of STIs do you see in a week / month? If number of cases of STI are zero then go to Q14</p>	<p>Week _____</p> <p>Month _____</p>																
<p>11.</p>	<p>What are the most common STIs that you see?</p> <ol style="list-style-type: none"> 1. Gonorrhea; 2. Syphilis; 3. Chlamydia; 4. Trichomonas Vaginalis; 5. Herpes; 6. Vaginal discharge; 7. Others <p>Specify _____</p>																	
<p>12.</p>	<p>Who are your clients / patients who come with STIs? (multiple answers apply)</p> <ol style="list-style-type: none"> 1. Women; 2. Men; 3. Boys; 4. Girls; 5. Others <p>Specify _____</p>	<table border="1"> <thead> <tr> <th>Response</th> <th>Age Group</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> </tbody> </table>	Response	Age Group														
Response	Age Group																	

13.	<p>How do you make the diagnosis of STIs in your practice?</p> <p>1=Based on patient's symptoms only 2=Based on patient's signs only 3=Based on laboratory test only 4=Based on patient's symptoms and signs 5= Based on patient's symptoms and laboratory tests 6=Based on patient's signs and laboratory tests 7=Based on patient's symptoms, signs and laboratory tests 8=Don't know 9=Other (specify)</p>	
14.	<p>Can you please tell me what do you understand by syndromic management of STIs?</p>	
15	<p>Do you use syndromic management in your own practice? If No then go to Q 18</p> <p>1=yes; 2=no</p>	
16.	<p>Have you been trained on syndromic management of STIs?</p> <p>1=yes 2=no</p>	

17	<p>If yes then</p> <p>Number of training _____</p> <p>Number of training days _____</p> <p>Place of training _____</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p>	
18.	<p>In the last week, approximately how many times have you prescribed/advised antibiotics to STI clients?</p>	
19.	<p>How did you most of the time decide which antibiotics to use? Multiple answers may apply</p> <p>1=Based on laboratory 2= Based on signs 3=Based on symptoms 4=Based on guideline 5=Based on patient demand 6=Habit 7=Based on the cost of the drug 8=Other (specify)</p>	
20	<p>Have you ever heard about antibiotic resistance? If no then go to Q23</p> <p>1=Yes 2=No</p>	

21.	If yes, please explain in a few words what do you understand by the term "antibiotic resistance".	
22.	Do you consider antibiotic resistance when prescribing/advising antibiotics? 1=Yes 2=No	
23.	What could be the consequences of untreated or incorrectly treated STI? 1=Infertility 2=Ectopic Pregnancy 3=Cervical Cancer 4=Premature birth 5=Miscarriage 6=Still Birth 7=Others Specify	
24.	In your opinion, what are effective ways to manage STI in Pakistan 1=Give expensive drugs 2= Give cheap drugs 3=Treat with antibiotics or other antimicrobials directly 4=Give effective drugs Refer to higher level 5=Give only counselling 6=Others (Specify)	

25.	Do you have any apprehensions / fear for treating patients with STI? 1=Yes 2=No	
26.	If yes, why	
27.	About confidentiality: What do you do to make STI patients feel that their confidentiality is respected (feel confident) during the consultation? (More than one answer possible) 1=Be friendly 2=Good interaction 3=Privacy 4=Ask about sensitive private matters 5=Ask about modes of transmission 6=Others (Please, specify)	
28.	What do you do to trace the route of transmission of an STI? (More than one answer possible) 1=Nothing 2=Ask about their sexual behaviour 3=Ask about their partner(s) 4= Ask about any partner(s) of their own partner(s) 5=Others (Please specify	

29.	<p>What are the symptoms that a male patient will come to you with Gonorrhoea?</p> <p>1=Difficult or painful urination; 2=Smelling pus containing yellow discharge; 3=Burning or difficulty in passing urine 4=Do not know 5=Others _____ Specify _____</p>	
30.	<p>How do you treat a patient with gonorrhoea?</p> <p>1=Ciprofloxacin 500 mg single dose 2=Counselling; 3=laboratory test 4=Do not know 5=others _____ Specify _____</p>	
31.	<p>How do you treat a female with abnormal vaginal discharge?</p> <p>1. Ciprofloxacin 500 mg single dose 2. Doxycycline 100 mg twice daily for seven days 3. Metronidazole 2 grams oral as a single dose 4. Do not know 5. Others Specify _____</p>	
32.	<p>If a patient comes to you with ulcers around the genital area, what is your diagnosis?</p> <p>1. Syphilis 2. Do not know 3. Others _____ Specify _____</p>	

33.	<p>What medicine do you give if you see a patient with ulcers around the genital area?</p> <p>1. Injection Benzathine Penicillin 2.4 million units intramuscular single dose 2. Do not know 3. Others _____ Specify _____</p>	
34.	<p>Have you seen patients coming back to you with complaints that the medicine prescribed did not cure the STI?</p> <p>1=yes 2=no 3=sometimes; 4=Others _____ Specify _____</p>	
35.	<p>If yes, which medicine that you had prescribed were referred to as not working?</p>	
36.	<p>How do you think AIDS spreads from one person to another?</p> <p>Multiple answers apply (Do not probe) By having sex with men.....1 By having sex with women ..2 By having vaginal sex3 By having anal sex4 By injecting drugs5 From mother's breast milk ..6 From mother to child7 Mosquito bite8 By using reused blades9 Reuse of needles / syringes10 By transfusion of infected blood and blood products..11 Others12 Specify _____</p>	

37.	<p>How do you think AIDS does not spread? Multiple answers apply (Do not probe) By eating in the same utensils 1 By kissing 2 By hugging 3 By swimming 4 By talking to each other 5 Others 6 Specify _____</p>	
38.	<p>How do you think AIDS can be prevented? Multiple answers apply. (Do not probe) By using condoms 1 By not having sex 2 By shaking hands 3 By transfusion of screened blood; 4 By using new syringes; 5 Avoiding mosquito bites. 6 Being faithful7 Others 7 Specify _____</p>	
39.	<p>Have you ever seen a person with full blown AIDS? 1=yes 2=no</p>	
40.	<p>Have you ever managed a person with HIV infection? 1=yes 2=no</p>	
41.	<p>Do you know how to manage a case with HIV infection or with AIDS? 1=yes 2=no</p>	

42.	<p>What are the medicine that are used to manage a case with HIV infection?</p>	
43.	<p>Have you been trained to manage HIV infection? 1=yes 2=no</p>	
44.	<p>If yes then Where _____ when _____ duration _____ _____ _____ _____ _____ _____ _____</p>	