

**Title: HIV prevention while bulldozers roll:
Developing evidence based HIV prevention
intervention for female sex workers following
the demolition of Goa's redlight area.**

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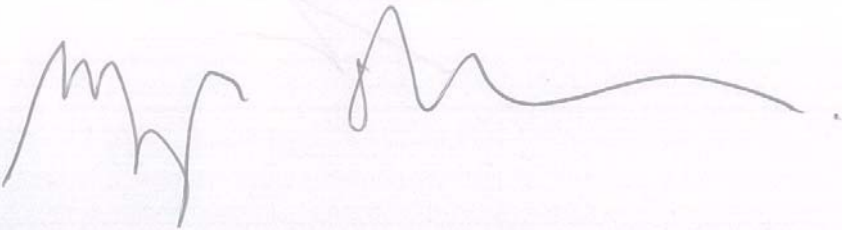
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University College London**

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**I declare that the work presented in this thesis is my own
work and this is the thesis upon which I expect to be
examined**

Signed Maryam Shahmanesh 26/2/2009



A handwritten signature in black ink, appearing to read 'Maryam Shahmanesh', is written across the page. The signature is fluid and cursive, with a long horizontal stroke extending to the right. The background is a light, textured surface, possibly a piece of paper or a scan of a document.

Abstract

Background: Interventions targeting female sex workers (FSWs) are pivotal to HIV prevention in India. Societal factors and legislation around sex-work are potential barriers to achieving this. In recent years several high profile closures of red-light areas and dance bars in India have occurred. In this thesis I describe the effects of the demolition of Goa's red-light area on the organisation of sex-work, HIV risk environment, and implications for evidence-based HIV prevention.

Methods: The pre-demolition phase was a detailed ethnographic study. The early post-demolition phase included rapid ethnographic mapping of sex-work in the immediate aftermath. The late post-demolition phase was a cross-sectional survey supplemented by an in-depth qualitative study. 326 FSWs were recruited throughout Goa using respondent-driven-sampling, and completed interviewer-administered questionnaires. They were tested for sexually transmitted infections (STIs) and HIV.

Results: The homogeneous brothel-based sex-work in Goa evolved into heterogeneous, clandestine and dispersed types of sex-work. The working environment was higher risk and less conducive to HIV prevention. Infections were common with 25.7% prevalence of HIV and 22.5% prevalence of curable STIs. Women who had never worked in Baina, young women, and those who had recently started sex-work were particularly likely to have curable STIs, a marker of recent sexual risk. STIs were independently associated with young age, lack of schooling, no financial autonomy, deliberate-self-harm, sexual-abuse, regular customers, street-based sex-work, Goan ethnicity, and being asymptomatic. Having knowledge about HIV, access to free STI services, and having an intimate partner were associated with

a lower likelihood of STIs. HIV was independently associated with being Hindu, recent migration to Goa, lodge or brothel-based sex work, and dysuria.

Conclusions: Tackling structural and gender-based determinants of HIV are integral to HIV prevention strategies. Prohibition and any form of criminalisation of sex-work reduce the sex workers' agency and create barriers to effective HIV prevention.

Abbreviations and definitions

AIDS	Acquired immune deficiency syndrome
ANC	Antenatal clinic
AWC	<i>anganwadi</i> centres
APAC	AIDS prevention and control project in Tamil Nadu
ARV	Antiretroviral therapy
<i>Avahan</i>	Gate funded India AIDS initiative
BJP	Bharatiya Janata Party
CBO	Community based organisation
CI	Confidence Interval (95% unless otherwise stated)
chlamydia	<i>Chlamydia trachomatis</i> infection
<i>devadasi</i>	Traditional sex workers dedicated to the temple and goddess <i>Yellama</i>
ELISA	Enzyme linked immunosorbent assay
FGD	Focus group discussion
FHI	Family Health International
FN	Field notes
FSW	Female sex worker
GD	Group discussion
<i>gharwalis</i>	Female brothel owner / Madam
gonorrhoea	<i>Neisseria gonorrhoeae</i> infection
<i>goondas</i>	Petty criminals and local gang members
GSACS	Goa state AIDS control society
GUD	Genital ulcer disease
<i>gutka</i>	A form of chewed tobacco popular in India
HIV	Human immune deficiency virus
HSV-2	<i>Herpes simplex</i> virus type-2
IBBA	Integrated behavioural and biological assessment
ICMR	Indian Council of Medical Research
ICTC	Integrated HIV counselling and testing centres
IDI	In-depth interviews
IDU	Injection drug users
IEC	Information education communication
IIPS	International Institute for Population Science (Mumbai)
ITPA	Immoral trafficking prevention act
KHPT	Karnataka health promotion trust
KII	Key informant interviews
MSM	Men who have sex with men
na	Not applicable
NACO	National AIDS Control Organisation (India)
NACP	National AIDS Control Program (India)
NARI	National AIDS Research Institute (India)
NFHS	National family health survey (I, II and III)
NGO	Non-governmental organisation
NIHFW	National Institute for Health and Family Welfare (India)
OR	Odds ratio
<i>Paan wallahs</i>	Betel-nut sellers
PCR	Polymerase chain reaction
Pimp	Person who takes a commission and finds customers for FSWs

PLHA	People living with HIV/AIDS
PPT	Presumptive periodic treatment
py	Person years
QA/QC	Quality assurance and quality control
RCT	Randomised controlled trial
RDS	Respondent driven sampling
RPR	Rapid plasmin reagin
RR	rate ratio or risk ratio
SOPs	Standard operating procedures
STD	Sexually transmitted diseases
STI	Sexually transmitted infections
TPHA	<i>Treponema pallidum</i> haemagglutination assay
trichomonas	<i>Trichomonas vaginalis</i>
UNAIDS	United Nations AIDS programme

Preface

The thesis presented here arises from a Wellcome trust training fellowship awarded to me by the Health Consequences of Population Change panel in 2002. I was the principal investigator on this study. The project was conceived and implemented by me. I was primarily responsible for the analysis and interpretation of the data arising from this study. My supervisors Dr Frances Cowan and Professors Vikram Patel and David Mabey were co-investigators and provided critical feed-back to the design, conduct and interpretation of the work. Dr Andrew Copas provided advice on the statistical analysis for the results presented in chapter 8 and 9, and in particular calculating the weights based on the respondent driven sampling.

The protocol for systematic review presented in chapter 3 was first developed for my masters in epidemiology thesis at the London School of Hygiene and Tropical medicine in 2002. The protocol was significantly revised and the search updated in 2006. The revised and updated version is presented in chapter 3 and has also been published in *Tropical Medicine and International Health*.

Parts of the material presented in chapters 5, 8 and 9 have been published in *Sexually Transmitted Infections*, the *American Journal of Public Health*, *Social Science and Medicine*, and the *Journal of Acquired Immune Deficiency Syndrome*.

The ideas, design, conduct and interpretation of the work presented in this thesis is my own and I take sole responsibility for the content of this thesis.

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I am grateful to the Wellcome Trust for supporting this work. I thank the board and staff of Positive People and Sangath; the research team and laboratory staff for their tireless work; Anil Pandey and Beethoven Fonesca for administrative support; Sushila Mendoza for cleaning the data; and the research participants. I thank Andrew Copas, Graham Hart and the staff at UCL centre for sexual health and HIV research; Beryl West, Rosanna Peeling, Dr Risbud, and Bharat Parekh for laboratory support; Douglas Heckathorne and Cyprain Wejnert; Ron Kessler and Rajesh Sagar; and all the journal reviewers. A special thanks to Mohsen Shahmanesh, who has inspired me over the years and proofed the final version of this thesis.

I dedicate this thesis to the courage of the sex workers of Baina and Goa and the love of my family. To my love Bawmra, for his inspirational food; Jaleh and Mohsen, for their tireless support; Nargess and Leigh for all the bubbles; and finally, to my adorable little Michka, who was conceived a few months before the demolition and has blessed our lives ever since. I could not have done it without you.

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1 Overview

1.1 *Synopsis of background*

The HIV epidemic in India, the world's second most populous country is of global importance. India's heterogeneous epidemic is concentrated in groups with high rates of high risk behaviour; i.e. core groups. To date India's concentrated epidemic has had little sustained transmission beyond core groups and their bridge population. Interventions that target core groups, such as sex workers, injection drug users, and men who have sex with men, are pivotal to HIV prevention in India. With up to 0.6-0.7% of the adult female urban population engaged in transactional sex, female sex workers constitute an important core group. In fact it has been suggested that prevention interventions in female sex workers alone is sufficient to control India's HIV epidemic. Yet data on this heterogeneous group remain patchy and outside of the four southern Indian high prevalence states, i.e. Andhra Pradesh, Karnataka, Tamil Nadu, and Maharashtra, coverage of female sex workers remains sub-optimal.

There is growing awareness that psychosocial and community-led processes underlie an individual's ability to adopt safer sexual behaviours. Acknowledging the role of structural factors in sexual behaviour change has led to 'high-risk environments' replacing 'high-risk groups'. Some have suggested a model that incorporates structural factors on a basis of a continuum of distance from risk. Others have constructed

hierarchical conceptual frameworks to define levels of “risk causation”. Gender-disadvantage is increasingly seen as an important structural factor affecting health outcomes in women. Gender-based-violence is a common manifestation of gender disadvantage. Lack of autonomy, poor education, early sexual debut, limited sexual choices, poor reproductive health, and social isolation are other manifestations.

The Lancet series on HIV prevention, published this year, reiterated the need to think in terms of ‘highly active HIV prevention’, using a combination of interventions situated at the level of society (structural), and community (participation and empowerment) and the individual (cognitive, behavioural and biomedical). Interventions implemented through community mobilisation are examples of community level interventions, and in their idealised form lead to gradual shifts in socially acceptable behaviours. The seemingly democratic nature of change that community action implies has led to widespread endorsement of empowerment as part of health promotion. If empowerment is a process of politicisation, wherein a person moves from consciousness, to knowledge to action (i.e. group identity to efficacy to agency), the role of the social context becomes immediately apparent. The very conditions of marginalisation and violence should constitute insurmountable barriers to empowerment of female sex workers and yet experience has shown that in a variety of settings they have been able to mobilise and collectivise. There is therefore a complex multidirectional relationship between society, community and the individual.

Goa is a small state with a concentrated HIV epidemic. As an annual destination spot for more than 1.5 million domestic and international tourists and the accompanying army of seasonal migrants, its epidemiological importance outweighs its size. On 14th June 2004, the Government of Goa demolished Baina, Goa's main red-light area. On the eve of the demolition there was still a dearth of data on the size of high-risk groups such as female sex workers, the epidemiology of HIV and STIs, and how the individual and structural factors interact to shape vulnerability to HIV. This situation that was likely to be exacerbated by the events that led up to and culminated in the demolition.

The Immoral Trafficking Prevention Act (ITPA) regulates sex work in India. Whilst the act does not prohibit prostitution per se, prostitution carried out in a brothel or within 200 metres of certain public places, is a criminal offence. Since the demolition of Baina several high profile closures of red-light areas and dance bars have taken place in India. In all cases, the settings were governed by populist religious (Hindu) fundamentalist political parties at the time of the closures and evictions. The Lok Sabha (the Indian parliament) is currently discussing amendments to ITPA, which will penalise the purchase of sexual services, i.e. criminalise clients. Although anti-prostitute, anti-migrant and public health rhetoric was used to justify the demolitions and evictions, they were only possible because of the ambiguous legislation around sex work, which will be compounded further by criminalisation of purchasing sex.

1.2 Rationale

Despite the widespread endorsement of empowerment as part of health promotion, collectivised and empowered sex workers remain the exception rather than rule. Moreover, in spite of mounting evidence for targeting sex workers as part of a comprehensive HIV prevention strategy, global coverage remains an elusive goal. The extent to which this failure is a result of societal factors, and specifically gender disadvantage and legislation around sex work, is the question explored in this thesis.

In order to explore this question and inform HIV prevention intervention design, we need to better understand the manner in which individual, community and societal factors interact to shape vulnerability in different epidemiological contexts. We also need to describe the impact of prohibitive policies on sex workers' 'risk environment' to create an evidence base to inform the public debate.

1.3 Aim

The aim of the study I have presented in this thesis was to work with female sex workers in order to describe the effects of the demolition of Baina red-light area on the organisation of sex work, the HIV risk environment, and its implications for future evidence-based HIV prevention.

1.4 Thesis overview

In the next chapter I describe the epidemiology of HIV in India and Goa and the national HIV prevention strategy. I highlight how this heterogeneous concentrated epidemic is driven by a complex interplay between commercial sex transactions and migration for work, or along the highways. I show why the National AIDS Control Programme defines the key HIV prevention strategy for this concentrated epidemic to be interventions targeting high-risk populations that are driving the epidemic, such as female sex workers. I explain why Goa is an epidemiological hotspot, and how existing interventions amongst sex workers were severely jeopardised by the demolition of the red-light area.

Targeted core group interventions have had a chequered history. In chapter 3, I explore this through the literature and present the findings of a systematic review of sexually transmitted infections and HIV prevention interventions in female sex workers in resource poor settings.

In chapter 4, I describe the study methods. This study was conducted in three phases. I first provide a schematic overview of the study. I then describe the details of each of the three phases, followed by an overview of data collection, management, laboratory methods, analysis and ethics.

I present the findings in five chapters. Chapters 5 and 6 and 7 are based on the qualitative study. Chapters 8 and 9 present the findings of the quantitative survey. In chapter 5, I describe the impact of the demolition on sex-work and the risk environment

for female sex workers in Goa. In chapter 6, I describe the contextual factors that make women vulnerable to transactional sex work and the process through which they enter the sex trade. In chapter 7, I describe the temporal, spatial and sexual organisation of sex-work throughout Goa with particular attention to structural vulnerabilities and typology in order to inform public health interventions.

Chapter 8 is divided into two sections. In the first half I present the prevalence and incidence of HIV and sexually transmitted infections. I then present the determinants of HIV and sexually transmitted infections, with a particular focus on the relationship between the underlying social and the proximal behavioural and sex-work determinants of infection. In the second part I will describe the differences between the ex-Baina based sex workers compared with sex workers who had never worked in the red-light area. In chapter 9, I shift the focus to the epidemiology and determinants of suicidal behaviour, as one of the underlying health factors that may affect vulnerability to HIV and access to care and treatment.

In chapter 10, I draw together the key findings and discuss them in the context of existing evidence. I discuss the strengths and limitations of the study. Finally, I present the intervention that emerged during the sharing of the study findings during dissemination to the sex workers, and discuss its implications for policy makers and future research.

2 The epidemiology of HIV in India and Goa; a review

2.1 Introduction

In this chapter I will summarise the epidemiology of HIV in India and Goa and the prevention strategy to date. I will highlight how this concentrated and heterogeneous epidemic is driven by a complex interplay between commercial sex transactions, migration for work, and movement along the highways. I will explore how the social context and, in particular, gender inequality contribute to the epidemic. I will show why the National AIDS Control Programme defines the key HIV prevention strategy to be interventions targeting core groups that have high risk behaviours, such as female sex workers. I will show that Goa is an epidemiological hotspot, and how existing interventions amongst female sex workers were severely jeopardised by the demolition of the red-light area.

Figure 2-1 Search strategy for background of HIV in India

Information for this chapter was obtained from various sources over the period of the study. This subject does not lend itself to a systematic review. I searched PubMed using broad terms such as “HIV”, “AIDS”, “STI”, and “India”. Reference lists of major articles and reviews were hand searched. I reviewed the websites for the National AIDS Control Organisation of India, Gates Foundation India, Family Health International, Population Council India, the AIDS Control and Prevention Project in Tamil Nadu, and the Karnataka Health Promotion Trust web sites as well as reports from these institutions. I also reviewed the annual reports from Goa State AIDS Control Society, government of Goa, and Goa based non-governmental organisations. I restricted the search to English language publications. Where available the more recent reports from the same organisation were given precedence. Finally, the bulk of this chapter is based on three well described national surveys conducted over the past ten years i.e. the National Family Health Survey-III (International Institute for Population Science (IIPS) & Macro International 2007), the Census of India (Government of India 2001), and the Integrated Biological and Behavioural Survey of populations at risk of HIV (Indian Council of Medical Research & Family Health International 2007), an Avahan supplement published by the journal AIDS in December 2008, and several comprehensive reviews (Chandrasekaran et al. 2006b; Hawkes & Santhya 2002).

Figure 2-2 Map of India



2.2 India

Containing the HIV epidemic in India, a country with a population of over one billion is of global importance. Even a low level HIV epidemic in a fraction of the 593 districts of India can have disproportionate socioeconomic consequences (Chandrasekaran et al. 2006). Sixty to eighty percent of Indian health care is provided by the private sector and only a minority of households have health insurance.

Consequently a single chronic illness can push households into debt (Hawkes & Santhya 2002; International Institute for Population Science (IIPS) & Macro International 2007; Sheikh et al. 2006). The social and economic fall-out of having HIV infection with the additive burden of HIV-related tuberculosis will therefore place an unacceptable burden on an already fragile health system. Although overall HIV prevalence is low, estimated to be 0.3% of the adult population, this figure conceals the geographic variation in prevalence of HIV and the disproportionate effect on marginalized and disenfranchised groups (National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007). It is thought that HIV may also slow the achievement of the millennium development goals and poverty reduction in India by as much as 23% between 2003 and 2015, potentially offsetting many of the gains hoped for from high rates of economic growth (Chandrasekaran et al. 2006).

2.2.1 Demographics

India has a population of more than 1 billion, spread across 31 States and 593 districts (Government of India 2001). The heterogeneity of this huge population is compounded by the differences in language, religion and history that underlie the political divisions of this country into 31 States. Socio-demographic factors, such as literacy, fertility rates, and economic indicators, also vary hugely across this enormous terrain (International Institute for Population Science (IIPS) & Macro International 2007). The population of India is young. Thirty five percent of the population is under the age of 15 and only 5% are 65 or older (International Institute for Population Science (IIPS) & Macro International 2007).

2.2.2 Socioeconomic conditions

India is a predominately rural country, undergoing enormous social change, as a result of rapid economic growth and changing global economic structures. The massive economic growth of the past decade has largely resulted from growth in the service and industrial sectors. This has coincided with a plateau in the growth of agriculture. This uneven growth is part of the explanation for the growing wealth disparity between rural and urban India. The most recent National Family Health Survey (NFHS-3) confirmed that two thirds of the population live in rural areas, the majority of which own parcels of land of five acres or less. A larger proportion of rural populations (28%) are from the lowest wealth quintile as compared with urban populations (3%) (International Institute for Population Science (IIPS) & Macro International 2007). Similarly there is a huge rural-urban disparity in basic household characteristics and access to amenities.

Inequity in India is enshrined in the caste system. The recent NFHS-3 survey showed that more than 2/3 of India's population belong to traditionally poor and lower castes - this includes 27% of households that belong to scheduled castes and scheduled tribes¹. Twenty seven percent of households hold below poverty line cards²; a definition of poverty based on household income. Although this proportion is high, there has been a substantial drop in those holding a below the poverty line card over the past three decades as this was over 50% of the households in the early seventies (International

1 Scheduled castes and scheduled tribes are castes and tribes that the government of India officially recognises as socially and economically disadvantaged and at particular need of protection from injustice and exploitation.

2 A card issued by the government of India to households under the official poverty line. The level has been fraught with controversy over the years, as it does not rise in line with inflation. Despite two digit inflation and in response to a petition brought to the Supreme Court, critical of the governments' tackling of poverty, the government of India maintained that the all-India poverty level remains at 455 (£6) rupees per month for urban populations and 328 (£4) rupees per month for rural populations. This translates into a household income of approximately 30 US cents a day.

Institute for Population Science (IIPS) & Macro International 2007). The extent to which this is a true reduction in poverty or just an indication that the poverty line is not rising at the same rate as inflation is a subject of much debate. Consequently, wealth indices based on household assets are gaining currency as a more reliable measure of poverty. Nonetheless, with using below poverty line cards as an indicator, nearly 1/3 of households in India are living on 30 cents or less a day (International Institute for Population Science (IIPS) & Macro International 2007).

Improvements in social and human development indices have failed to keep up with the economic gains of the past decade. Despite substantial improvement in literacy, health and sanitation since independence, India still lags behind many countries with similar economic performance. India ranks 126 out of 177 countries on human development indices (United Nations Development Programme 2007) and this has only improved two positions since 1999.

Access to clean water, sanitation and electricity is not universal; 68% of households have electricity; 45% have any toilet facilities; just over half of rural people access water from a tube-hole or bore-hole; and 71% of urban and 28% of rural households have access to piped water. Half of the population have access to water on the premises and the remainder have to travel to collect water. In the majority of the cases it is the adult woman or girl child that collects water. Less than half of the population and one quarter of the rural communities have access to a toilet. Seventy two percent of children of primary school age attend school and half attend secondary school. Twenty-two percent of men and forty-two percent of women have never attended school. This figure hides enormous geographic variation; in Kerala 5% of

men and 10% of women over the age of six have never attended school, in Goa the same figures are 10% and 20%, whilst in Bihar they are 35% and 60% respectively (International Institute for Population Science (IIPS) & Macro International 2007).

Nutritional deficiency remains a common problem in India. Forty-eight percent of children under five are stunted and 43% are under weight. Seven out of 10 children aged 6-19 months are anaemic. Amongst adults, 36% of women aged 15-49 have a BMI less than 18.5 as do 34% of men; 55% of women and 24% of men are anaemic (International Institute for Population Science (IIPS) & Macro International 2007).

Over the past decade the economy has impacted upon rural and urban areas in markedly different ways. On the one hand the huge economic boom, in particular in the services industries, has led to increasing job opportunities in the cities and urban settings. On the other hand there has been a decline in agriculture and impoverishment of the countryside. The unequal growth between the agricultural sector and the industrial and services sector has led to marked disparity between the socio-economic conditions of neighbouring regions, and in particular the town and countryside.

In order to supplement household income as a measure of poverty, the NFHS-3 developed a wealth index based on 33 household assets and characteristics. Based on this definition there is also a clear rural - urban divide in wealth; 48% of the urban population in contrast with 7% of the rural population are in the highest wealth quintile. There is also huge state to state variation, e.g. more than half the population

of Goa and Delhi compared to less than 10% of the population of Bihar and Orissa are in the highest wealth quintile. The immediate consequence of the geographical variation in wealth has been the short and long-term migration for work. In India an estimated 258 million adults are migrant (Government of India 2001). The sprawling urban slums of megacities like Mumbai, the huge armies of seasonal migrants who travel between their farms and occasional work in the construction boom, and the growing tensions between host populations and migrants who are often of different ethnicity, language and religion, are some of the social consequences of this uneven and rapid social change (Government of India 2001).

2.2.3 Gender inequality

Despite clearly defined legal and constitutional equality, women's status in India remains low. Son-preference is high with 20% of adult population wanting a boy and less than 2% wanting a girl. The 2001 Indian census found a ratio of 927 girls per 1000 boys 0-6 years of age (Government of India 2001). Five years later the national family health survey found that this had declined further to 918 girls per 1000 boys (International Institute for Population Science (IIPS) & Macro International 2007). This is predominately as a result of further declines in the sex ratio in rural areas; women with sons are more likely to be using contraception; and women with no sons were more likely to have a pre-natal ultrasound test for sex determination. Examination of the sex ratio pre and post-ultrasound suggests that there is differential termination of female pregnancies (Davar & Wayal 2001; International Institute for Population Science (IIPS) & Macro International 2007).

Women are economically dependent on men. Forty three percent of women aged 15-49 compared with eighty seven percent of men of the same age were employed. One quarter of employed women received no remuneration for their work and twelve percent are paid in kind. The majority of women are employed in agriculture. Therefore the decline in agriculture has disproportionately affected women's earning power and made transactional sex one of a dwindling number of employment opportunities (International Institute for Population Science (IIPS) & Macro International 2007).

The recent national family health survey found that the majority of women still have little autonomy and are not involved in decision making within their families/households. Female literacy is lower than men's; 55% of women compared to 78% of men are literate. One in three women compared with one in five men are not exposed to newspapers, magazines, television, radio or cinema. Less than half (45%) of women have money they can spend and only 15% have a bank or savings account. Two thirds of women are not free to visit a market, health facility, or places outside the community without permission or accompaniment. Only one third of women participate in decisions made about their health care, household purchases, or visits to family and relatives (International Institute for Population Science (IIPS) & Macro International 2007).

Intimate partner violence is ubiquitous. The national family health survey found that more than half (54%) of women believe it is justified for a man to beat his wife. One third (34%) of women aged 15-49 have ever experienced physical violence and 9% sexual violence. Thirty seven percent of ever-married women have experience of spousal sexual or physical violence and 16% have experienced spousal emotional

violence. Women whose mothers were beaten by their fathers were twice as likely to be beaten themselves. Two thirds of all women subject to intimate partner violence never sought help or told anyone about the violence (International Institute for Population Science (IIPS) & Macro International 2007).

Indian women are initiated into sex and child bearing at a young age, mainly as a result of the young age of marriage that persists despite legal restrictions. More than half of women are married before the legal age of 18 and one in six women age 15-19 have begun child bearing. In the national family health survey, just over half of the 15-21 year old women reported ever having had sex, predominately within a marital relationship. There are age differentials between women and their male sexual partners. Of the young women (15-19) who had sex in the previous 12 months, 11% had sex with men more than 10 years older than themselves (International Institute for Population Science (IIPS) & Macro International 2007).

2.2.4 Health care

The health care systems in the Indian subcontinent rely on a multitude of care providers from the public, private and alternative sector, working in a fragmented health care system. With public health expenditure amongst the lowest as a proportion of gross domestic product in the world (<1%), most health care is subsidized by private income with 60-80% of health care delivered through the private sector. Moreover only 5% of the population is covered by health insurance and so private health care costs come directly out of household expenditure (Hawkes & Santhya 2002; International Institute for Population Science (IIPS) & Macro International 2007; Mahal et al. 2004). Additional factors contributing to the

fragmentation of health care in this consumer-driven health care system are a prolific pharmaceutical industry with easily available over-the-counter generic drugs and non-rational prescribing practices (Patel et al. 2005).

India performs poorly on several health indicators. Although on the way down, child mortality is still 57 per 1000 live births and peri-natal mortality is 49 per 1000 pregnancies. Infant mortality is almost double in rural areas compared with urban settings. Uptake of antenatal care varies across India. Two thirds of women have at least one antenatal clinic visit; this rate varies between 17% in Bihar to 90% in Goa, Kerala, and Tamil Nadu. Only 23% of antenatal women took iron and folic acid supplements for 90 days, yet 25% had a pre-natal ultrasound. Overall, 39% of deliveries take place in a health facility, 47% of births are assisted by a health care professional, 1/3 by a traditional birth attendant and 16% by friend or family member. Over half did not receive a postnatal check up; this is particularly the case for those who deliver at home, where only one in ten received a post-natal check up (International Institute for Population Science (IIPS) & Macro International 2007).

Under the integrated child development services, established in 1976, the anganwadi centres (AWC) were developed to provide children with nutritional, health and education services from birth till six years old and pregnant and breastfeeding women with health care and nutrition. Eighty percent of children are covered by AWC, however only 28% of children under six actually received the nutrition, health and educational services in the year preceding the survey (International Institute for Population Science (IIPS) & Macro International 2007). Similarly only one in five women received AWC services during pregnancy and lactation. Only 44% of

children aged 12-23 months were fully vaccinated and 5% had not received any vaccinations. Again we observe marked regional variations in these figures, with less than one third receiving vaccination in the North and North Eastern States, compared with more than three quarters in Goa, Tamil Nadu and Kerala (International Institute for Population Science (IIPS) & Macro International 2007).

Several studies have described a relationship between female literacy and gender empowerment, and maternal and child health (Manandhar et al. 2004; Sen 1999). Part of the national heterogeneity in maternal and child health may be explained by the marked variation in female literacy, in addition to the other factors such as the degree of urbanisation, overall state of public health services, and the socioeconomic status of the area. The national family health survey also found a relationship between gender empowerment, using a gender empowerment index derived from the survey, and reduced infant mortality (International Institute for Population Science (IIPS) & Macro International 2007).

2.3 HIV in India

The HIV epidemic in the Indian subcontinent is by and large in the concentrated phase. It is markedly heterogeneous in its distribution, with a multitude of mini and sub-epidemics. These are driven by sexual and injection drug use routes of transmission, with trafficking routes, migration for work and transport routes determining the direction of spread.

2.3.1 Size and phase of epidemic

The first case of HIV was detected in 1986 in sex workers from Chennai in the southern State of Tamil Nadu. In 2006 the estimated numbers of people living with HIV were 2.47 million (2.0-3.1 million). Adult HIV prevalence was 0.36% (0.27%-0.47%). The prevalence amongst men (0.43%) was greater than women (0.29%). Estimated adult HIV prevalence was higher than 1% in Manipur (1.67%), Nagaland (1.26%) and Andhra Pradesh (1.05%). States with prevalence between 0.7% and 0.8% were Karnataka, Maharashtra, Goa, and Mizoram. The estimated prevalence in injection drug users (IDU) was 7%, in men who have sex with men (MSM) 6.5%, female sex workers (FSWs) is 5%, and sexually transmitted infection (STI) clinic attendees were 3.7%. There was huge variation between the various sentinel sites, as well as the various districts. Prevalence was higher for urban compared to rural areas, with the exceptions of Punjab, Tamil Nadu and Uttar Pradesh (National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007).

The HIV epidemic in India is concentrated, with rates of 6-8 times higher in the high risk groups compared to those in the general population. It remains a very heterogeneous epidemic with marked variation by state and even larger variations between districts within and between each state. For example of the 118 districts that have HIV prevalence above 1% among antenatal clinic attendees, 26 are in low or medium prevalence states (National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007). Within the state of Karnataka, surveys of HIV prevalence in the general population have recorded rates

as variable as 2.9% in Bagalkot to 0.8% in Mysore (Becker et al. 2007; Moses et al. 2008; Munro et al. 2008)

2.3.1.1 Limitations of the data

Data about the HIV epidemic in India comes from several sources: 1) sentinel surveillance, 2) country wide general population surveys and 3) specific surveys of high risk populations. Each data source has specific strengths and limitations.

The sentinel surveillance: India's sentinel surveillance like that from many other sources utilises antenatal clinic sentinel sites as a surrogate for the general population, and STI clinic attendees as a surrogate for clients of sex workers. Prevalence data from the high risk groups such as FSWs, IDUs, and MSM are collected anonymously using targeted survey methodology. In the 2006 estimates, 1122 sites were used which included 470 urban and 158 rural antenatal clinic sites, 251 sexually transmitted disease (STD) clinics, 51 IDU, 31 MSM and 138 FSW, and a handful of migrant workers, truckers and fishermen sites. All the health sector sites were public sector.

Using antenatal surveillance as a surrogate for the general population has several limitations. Antenatal clinics are often based in urban government centres whilst the majority of the population are rural. The low levels of public sector care usage suggest that public sector antenatal care users are less likely to represent the general population. Moreover, the rate of antenatal attendance and ratio of public to private care varies across the country. The low mean age of voluntary sterilisation (25.5 years) and the high proportion of women that choose this method of contraception

(37%) further skew the data (Chandrasekaran et al. 2006; Gregson et al. 2002; International Institute for Population Science (IIPS) & Macro International 2007). When antenatal surveillance has been compared to representative population surveys there have been mixed results. In Tamil Nadu general population studies gave higher prevalence than sentinel sites (Kang et al. 2005; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007; Thomas et al. 2002), whilst the HIV prevalence recorded in the population surveys conducted in Mysore and Bagalkot in Karnataka were only marginally lower than the sentinel surveillance sites (Moses et al. 2008). In the Guntur district of Andhra Pradesh, on the other hand, the population estimates of 1.7% were almost half the 3% observed in sentinel surveillance sites (Dandona et al. 2006a; Dandona et al. 2006b). In 2005 estimates of HIV prevalence through the third national family health survey of India (NFHS-3) confirmed the findings in Andhra Pradesh that in the majority of settings antenatal clinic surveillance had led to an overestimate in prevalence. Using the data from NFHS-3 and the population estimates in Andhra Pradesh the HIV prevalence estimates in India were halved.

Using sentinel surveillance data to estimate trends in HIV prevalence is also problematic. Firstly, there has been a rapid expansion in sentinel surveillance sites over a relatively short period of time; often with sites in lower prevalence areas being added. Secondly there have been changing assumptions in the estimates. Thirdly there may be temporal changes in antenatal clinic attendance (Chandrasekaran et al. 2006).

National Family Health Surveillance 3: This was designed to provide an overall estimate of HIV prevalence for India and more precise estimates for the high prevalence states. The seven high prevalence states were therefore over-sampled. All the women 15-49 and men 15-54 residing in the households sampled in the seven high prevalence states were eligible for HIV testing, except Nagaland where there was political opposition. Uttar Pradesh was included as an example of a low prevalence state. In the remaining 22 states, six households per enumeration area were chosen at random and all women aged 15-49 and men aged 15-54 were invited for testing. 85% of the 62182 eligible women and 78% of the 64175 eligible men were tested for HIV using dry blood spots (Solomon et al. 2002). Nationwide prevalence was 0.28% (0.22% for women and 0.36% for men) with rates in the high prevalence states estimated to be, Manipur 1.13%, Andhra Pradesh 0.97%, Karnataka 0.69%, Maharashtra 0.62%, Tamil Nadu 0.34%, and the one low prevalence state included, Uttar Pradesh 0.07%. Although this provides a relatively robust estimate for HIV prevalence in the high prevalence states, it is less robust for nationwide HIV prevalence as the estimates for the lower risk states are based on very small sample sizes. Moreover, the prevalence in high risk groups cannot be extrapolated from the NFHS-3 data; high risk groups are likely to be under-represented in a household survey (International Institute for Population Science (IIPS) & Macro International 2007).

High risk groups: To understand the drivers of early stage epidemics there is a need to understand the size and prevalence of HIV within the core groups within which HIV is concentrated, as well as to periodically assess their risk behaviours with the addition of biomarkers such as bacterial STIs and HIV (Rehle et al. 2004; Zaba et al.

2005). This group is unlikely to be well represented in a population-based sample such as the national family health survey. Equally, the use of facility-based samples, such as people who attend sexual health clinics or surveillance of FSWs, MSM, and IDU, that are in contact with services, will give a biased estimate of size, behaviours and infection prevalence (Magnani et al. 2005). As a consequence of years of sustained large scale HIV prevention in the high prevalence southern states there are fairly comprehensive mapping and size estimates of these high risk groups which have been used to make the current estimates more robust. However, there is a dearth of such robust data from the low and medium prevalence states (Chandrasekaran et al. 2006; Dandona et al. 2004).

2.3.2 Drivers of India's HIV epidemic

2.3.2.1 Grouping India's States

For the purposes of this section I have borrowed a table outlining the differences in the extent and availability of data, the severity of the epidemic and its drivers and the status and comprehensiveness of the response from a review commissioned by the National AIDS Control Organisation (NACO) and the Bill and Melinda Gates Foundation (Chandrasekaran et al. 2006). Although, according to the most recent estimates Tamil Nadu may no longer be a high prevalence state and Goa looks more like the neighbouring states of Karnataka and Maharashtra, the National AIDS Control Organisation division of states into high, moderate and low prevalence provides clarity and consistency. In summary, group 1 and 2 are high prevalence states divided between predominate sexual transmission in the large southern Indian states and injection drug use transmission in the northeast states abutting Myanmar

(Burma). Group 3 includes the medium prevalence states for which we have some data and group 4 includes low prevalence (vulnerable and highly vulnerable) states for which we have little or no data.

Table 2-1 HIV prevalence, characteristics of epidemic and quality of data available for the four groupings of Indian states

Group	Selected characteristics	HIV prevalence	Data source	High risk group data
Group1 Four high prevalence southern states (Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu)	-Population 292 m -Predominate risk behaviour sexual -Number estimated in each of the high risk group FSW: 338000, 1.27% of urban female population (Avahan programme data) ³ 150421-194594, 0.56-0.73% of adult female population (NACO) 869000 (estimate) MSM: 115000 (Avahan) 37548-58396 (NACO) -Prevention program 7-12 years of FSW and high risk male program IDU and MSM more recent	At least 25% of districts with > 1% ANC HIV prevalence over 3 years FSW 1.2-54.3% MSM 4.2-19.2% IDU 0-63.81% STD 3.6-32.4% Revised population prevalence AP 1.05% Karnataka 0.81% Maharashtra 0.74% Tamil Nadu 0.39% NFHS -3 estimates AP: 1% Karnataka 0.7% Maharashtra 0.6% TN 0.3%	ANC surveillance in some districts for over 7 years ANC surveillance in all districts for 2 years 25-40% of districts have surveillance of STD clinic attendees. 5-25% have facility-based surveillance of high risk groups NFHS 3 HIV prevalence data available	Reasonable to high quality mapping and size estimation of FSW, MSM and IDUs Some behavioural and HIV prevalence/ survey data Some facility based studies

³ Avahan is a Bill and Melinda Gates Foundation funded HIV prevention programme in the high prevalence states of India, Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Nagaland and Manipur. In all these settings Avahan has invested in detailed mapping and size estimates of the high risk groups. Where Avahan programme is cited as the source of data it includes all estimates of size, both Avahan and State AIDS and Control Societies.

<p>Group 2 Three northeast states (Nagaland, Manipur, Mizoram)</p>	<p>Population 5.7 million Predominate risk behaviour IDU Number estimated in each of the high risk groups FSW 7,998, 1.28% of female urban population (NACO) MSM 1,058-2,700 (NACO) IDU 54,000 exclude Mizoram (Avahan) 45,936-53,952, 1.9-2.7% of the adult population (NACO) Prevention over 8 years of IDU Sex worker and MSM more recent and limited</p>	<p>At least 25% of districts with > 1% ANC over past 3 years (except Mizoram) FSW 4-29.7% MSM 10.4-29.2% IDU 0.4-33.6% STD 3.5-15.6 % Revised population prevalence Manipur 1.67% Nagaland 1.26% Mizoram 0.74% NFHS-3 estimates Manipur 1.1 %</p>	<p>As above for Nagaland and Manipur, except that surveillance for high risk groups are limited to one site per group per state. Mizoram 40% of districts and 10% of STD clinics have surveillance NFHS only collected data on Manipur</p>	<p>Good quality mapping and size estimates for the IDUs/sex workers Some facility and population-based studies</p>
<p>Group 3 Loose grouping of moderate prevalence states (Kerala, Gujarat, Goa, West Bengal, Pondicherry, Delhi)</p>	<p>Population 187 m Predominate high risk behaviour: Sexual (presumed) Number estimated in each of high risk groups FSW: 413,000-500,000 (estimate) 104,217-125,907, 0.6-0.7% of the urban female population (NACO)</p>	<p>Regionally <1% median ANC prevalence FSW 0.5-43% MSM 0.5-39.6% IDU 0.8-22.8% STD 0-16.5% Revised estimates</p>	<p>On average 40-50% of districts covered by ANC and STD sentinel surveillance. High risk group surveillance is limited to one site per state except in West Bengal</p>	<p>Reasonable mapping data for sex workers Some behaviour/prevalence data Few facility-based studies</p>

	MSM 26,166-76,074 (NACO) IDU 15,364-24,787 (NACO) Prevention for 7-12 years among FSW and high risk men. Programming Among MSM and IDU recent and limited	Goa 0.73% Pondicherry 0.55% Gujarat 0.43% West Bengal 0.30% Delhi 0.27% Kerala 0.13%		
Group 4 Rest of India (further divided into highly vulnerable and vulnerable)	Population 576 m Predominate high risk behaviour presumed sexual Number estimated in each high risk group FSW 870,000-1,000,000 (estimate) 29,422- 85,376, 0.1-0.3% of urban female population (NACO) MSM 2,655-12,513 (NACO) IDU 8,268 -15,956 (NACO) Prevention 7-12 years of limited high risk group prevention programming	As in group 3 <1% ANC FSW 0-8% MSM 0-4.8% IDU 0-17.6% STD 0-6% NFHS Revised estimates A&N Islands 0.37 Chandigarh 0.34 Orissa 0.22 The rest 0.03-0.17% NFHS 3 Uttar Pradesh 0.07%	On average 25% of districts covered by sentinel surveillance of ANC. Surveillance in high risk groups sparse	Limited mapping and size estimations Little or no behavioural/ biological survey data Few facility-based studies

The data from group 1 and 2 and to a lesser extent group 3 states suggests that the Indian epidemic is driven through contact between high risk and bridge populations with onward transmission to spouses and girlfriends but without further spread - a so-called truncated epidemic. There are, however, pockets in coastal Andhra Pradesh, Northern Karnataka and southern Maharashtra where there seem to be small foci of generalised epidemics, with prevalence of HIV sustained above 1% in the general population. However, even within the same district there is huge variability in HIV prevalence between villages. For example the prevalence of HIV in a population based study in the district of Bagalkot of northern Karnataka found HIV prevalence in ten villages ranging from none to eight percent (Becker et al. 2007). One suggested explanation for this are that local sexual networks may be sustaining ongoing epidemics (Chandrasekaran et al. 2006). Alternatively there may be structural factors such as migration patterns, typology and tradition of sex work, varying behavioural patterns, or biological factors, such as HSV-2 and circumcision, underpinning these stark differences (Avert et al. 2001a; Avert et al. 2001b; Buve 2002).

2.3.2.2 High risk groups and transmission risk

Key high risk populations identified by the National AIDS Control Programme are female sex workers (FSWs), men who have sex with men (MSM) and injection drug users (IDU). Bridge populations are clients of FSWs, regular partners of FSWs, men who have both male and female sexual partnerships, and IDUs (Chandrasekaran et al. 2006; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007).

2.3.2.2.1 Female sex workers

Mapping data from group 1 and 3 suggests that female sex workers (FSWs) comprise 0.6-0.7% of the urban adult population with somewhat higher numbers in the northeast states. The huge discrepancy between group 4 states and the other settings suggests that either the number of FSWs is grossly under-represented, or, that the difference in FSW numbers is part of the explanation for the heterogeneity of the epidemic.

Transmission risk varies considerably according to the type of sex-work, as there are significant variations in number of sexual partners, non-paying sexual networks, likelihood of condom use, and mobility of both sex worker and clients, between the sex worker types (Blanchard et al. 2005; Blanchard et al. 2007; Dandona et al. 2005b; Dandona et al. 2006c; O'Neil et al. 2004; Ramesh et al. 2008). The National AIDS Control Organisation currently uses a categorisation of FSWs based on where they solicit for clients. Avahan data and studies from Andhra Pradesh, suggest that in southern states less than 10% of sex-work is brothel-based, with 60% of FSWs working from the street, 10% working through lodges and 20% working from home (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). A substantial proportion of sex-work, particularly in the southern states is rural and traditional (Blanchard et al. 2005) with clustering and heterogeneity even within districts (Blanchard et al. 2007). Categories of sex-work are fluid and change in response to economic or political pressures. Moreover there is variation between sex workers in sexual risk behaviours, empowerment and collective identity (Asthana & Oostvogels 1996; Bhawe et

al. 1995; Blankenship et al. 2008; Brahme et al. 2006; Chandrasekaran et al. 2006; Dandona et al. 2005b; Dandona et al 2006c; Desai et al. 2003; Halli et al. 2006; Hawkes & Santhya 2002; Indian Council of Medical Research & Family Health International 2007; Jana et al. 1998; Ramesh et al. 2008; Sarkar et al. 2005; Sarkar et al. 2006; Sarkar et al. 2008)

Even amongst the well-characterised sex workers of group 1 states there is a huge variation in the number of sex workers and the prevalence of HIV amongst sex workers. A representative study of 7,280 FSWs in a district of Northern Karnataka found that 87% worked and lived in rural areas. They were highly clustered with 15% of villages accounting for 45% of the FSWs (Blanchard et al. 2007). General population HIV was highest in places with the highest concentration of FSWs (Becker et al. 2007; Blanchard et al. 2007). HIV prevalence amongst sex workers also seems to be hugely varied. The 2004/2005 Integrated Behavioural and Biological Assessment (IBBA) investigated the prevalence of HIV in representative samples of high risk and bridge populations using similar methodology in the six high prevalence states and found huge geographical variation in HIV and STI prevalence (n=10,096). In Karnataka alone the HIV prevalence ranged from 11-34% among FSWs in the different districts (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). Another key finding that of the IBBA was that HIV prevalence amongst FSWs rises rapidly with age and duration in sex-work and plateaus thereafter. This suggests that most sex workers go through a very high risk period after initiation (Indian Council of Medical Research & Family Health International 2007).

2.3.2.2.2 Men who have sex with men

The limited data we have on this group suggest that it is a high risk group. HIV prevalence in men who have sex with men (MSM) in the IBBA was between 7-21%, male to male sexual activity seems to be relatively common in urban and rural settings and many MSM also have female sexual partners (Chandrasekaran et al. 2006). Given the complex social construction of male homosexuality, reliability and comparability of size definitions depend on the inclusion criteria used. For example qualitative and ethnographic studies have suggested that men who have sex with men in India define themselves, albeit fluidly, as follows, kothis who only have anal receptive sex, double-deckers, who have both receptive and insertive anal sex, panthis, who only have insertive anal sex and the varieties of transgender and transsexuals (Asthana & Oostvogels 2001; Brahman et al. 2008). These groups do not necessarily identify with one another or self define themselves as men who have sex with men. One population survey of five rural districts found a prevalence of 10% of single men and 3% of married men reported having had anal sex with a man in the previous year (Verma & Collumbien 2004). State-wide mapping of urban areas of Tamil Nadu, Andhra Pradesh and Karnataka in 2003-4 suggested that up to 25% of the urban sex worker population may be male and transgender sex workers (Chandrasekaran et al. 2006).

MSM in India commonly have female sex partners, often their spouse. One large study of 6,661 MSM in Andhra Pradesh found that 42% were married and 50% had sex with a female partner in the past three months, and only 44% used condoms with male partners

and 16% with female partners (Dandona et al. 2005a). The recent IBBA surveyed 4597 MSM across the four high prevalence southern states found that although 80% had used a condom with their last paid male partner only one third used condoms with their non-paying non-regular partners. The same survey found that 4-43% reported having regular female partners and 14-36% had contact with FSWs, with Kothis being the most likely to have a female sexual partner (Brahmam et al. 2008).

2.3.2.2.3 Injection drug use

Injection drug use (IDU) is an important driver of the epidemic in the northeast. IDU is common in the northeast and certain urban settings, unsafe injecting practices and unsafe sexual behaviour have been commonly reported.

Size estimates place the prevalence of injection drug users (IDU) at around 1.9-2.7% of adult urban populations. One study found that 2/3 of IDUs were sexually active and 3% used condoms (Eicher et al. 2000). Only one in four female partners of IDU had heard of HIV (Chandrasekaran et al. 2006; Panda et al. 2000; Panda et al. 2001; Panda et al. 2005; Panda et al. 2007). A study of 228 IDU in West Bengal found that two thirds share needles and half visit sex workers (Panda et al. 2007). The IBBA also found that half shared needles and a quarter had paid for sex and consistent condoms use with their regular female partners was low (Mahanta et al. 2008).

There is some suggestion that the harm reduction programmes in the northeast are beginning to show effect (National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007), whilst, the importance of the

intersecting epidemic in FSWs is becoming more apparent. In Manipur the prevalence in FSWs is rising whilst prevalence in IDU falls (National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007). Mapping in the three northeast states shows substantial numbers of sex workers in the urban/ valley areas where injection drug use is also prevalent. One small study of 69 female drug users suggest that two thirds exchange sex for money (Panda et al. 2001). However, there is limited data on the prevalence of IDU amongst sex workers throughout the northeast.

2.3.2.3 Bridge populations

The key bridge populations in India are the clients of FSWs, regular partners of FSWs, men who have sex with both men and women, and sexual partners of IDUs.

Understanding the relationship between bridge populations and core groups has been difficult. Several large population-based studies have attempted to describe the determinants of HIV at a population level. Three of these, in high prevalence districts of Andhra Pradesh, northern and southern Karnataka, found similar behavioural determinants of HIV. A large population-based survey of 12,617 respondents in the Gunter district of Andhra Pradesh found that prevalent HIV in men was associated with, blood transfusions; having paid for sex; number of sexual partners; consumption of alcohol prior to sex; male non-circumcision; and tattoos (Dandona et al. 2008). The population-based survey of 6,700 respondents in the Bagalkut district of northern Karnataka found that, multiple partners, paying for sex and receiving medical injections were associated with HIV (Becker et al. 2007). A population survey of 4653 respondents

in Mysore district of southern Karnataka found that HIV was strongly associated with lifetime number of sexual partners and self-reported condom use- ever having used a condom for men, and condom use during last sexual intercourse for women (Munro et al. 2008).

It has, however, been difficult to measure the prevalence and distribution of these high risk behaviours, and potential bridge populations in the general population. STD clinic attendees have been a poor surrogate for clients of FSWs and it has been difficult to include clients of FSWs in behavioural surveillance. The most recent behavioural survey used location-cluster approach to recruit clients of FSWs and found refusal rates ranging from 47% to 76% (Indian Council of Medical Research & Family Health International 2007; Subramanian et al. 2008). Amongst the 4861 men that did participate in the survey, HIV prevalence ranged from 2-11%, syphilis 3-10%, and gonococcal or chlamydial urethral infections of 0-4%. More than two thirds also had non-paying regular female partners. One third reported having both non-paying regular and casual sexual partners, in addition to paying sexual partners. Reported consistent condom use with FSWs was 28% and with non-paying regular female partners was 5% (Indian Council of Medical Research & Family Health International 2007; Subramanian et al. 2008). This pattern of sexual mixing suggests that we need a greater understanding of the clients' non-transactional sexual networks and in particular the degree of concurrency between regular and non-regular, paying and non-paying sexual partners.

An alternative has been to look at the prevalence of high-risk behaviours in the larger national surveys. This has provided the mixed picture that the heterogeneity of India's HIV epidemic implies. Overall it would seem that sexual risk behaviour at a population level is low but there are pockets of higher risk sexual behaviour. A general population behavioural survey in 2001 suggested that 11% of men and 2% of women engaged in non-regular sexual relationships (National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001). This is higher than the sexual behaviour data collected by the NFHS-3 in 2005 suggests, with 5% of men and 0.2% of women reporting sex with someone who is neither a spouse nor a cohabiting partner in the past 12 months (Indian Council of Medical Research & Family Health International 2007). This may be a sampling effect as there are regional differences in self reported sexual behaviour. For example 15-19% of men and 7% of women from Andhra Pradesh and Maharashtra compared with 4-5% of men and 0.5-1% of women from Orissa, Rajasthan and West Bengal reporting non-regular partners (National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001). It may also be that sexual behaviour surveys are designed to capture the 'higher risk' population as compared to a household survey. Moreover, the context of survey and the focus of the survey questions may lead to varying degrees of reporting bias. The latter explanations are supported by the finding that national surveys find less high risk behaviours than smaller or more targeted behavioural surveys. NFHS-3 suggested that the men with the higher risk sexual behaviours are from the northeast (Nagaland, Arunchal Pradesh, Sikkim, Mizoram and Meghalaya) and Punjab, Delhi, Uttar Pradesh, Madhya Pradesh (Indian Council of Medical Research & Family Health International

2007). Behavioural surveys from Tamil Nadu and Karnataka suggest 11-18% of rural men and 10% of factory workers and men in urban slums have contact with FSWs (Chandrasekaran et al. 2006), whilst the NFHS data suggests that <1% of the general population of men have visited a FSW in the past 12 months (International Institute for Population Science (IIPS) & Macro International 2007). The higher risk sub-groups identified through these surveys are mobile populations, including truckers and seasonal single male migrants.

The population based study of more than 12,000 in Andhra Pradesh suggested that drinking alcohol before sex was a risk factor for HIV (Dandona et al. 2008). There has been a growing awareness of the nexus between alcohol access points and commercial sex, particularly in urban settings. A study of 1,741 high risk men in Mumbai found that 66% had sex with a female sex worker under the influence of alcohol and that men who had sex under the influence of alcohol were one and a half times more likely to have HIV (Madhivanan et al. 2005). A study of 1,196 male patrons of wine shops in Chennai found 43% had sex with non-regular female partners and 89% had alcohol before sex (Sivaram et al. 2007; Sivaram et al. 2008). Although these associations are potentially confounded by other socio-demographic differences it suggests that bars and wine shops may be sites to access potential high risk men and bridge populations.

2.3.2.3.1 Migrants as bridge population

Large scale population movements are a common occurrence in India and are mainly made up of single young men migrating for work. This can either be rural-urban migration, e.g. 50% of the growth of Mumbai over the past four decades is a result of

rural-urban migration. It also includes seasonal interstate migration for work (Government of India 2001; National Sample Survey Organisation 2001). Although NFHS failed to find an association between migration over the past 12 months and HIV, they did find that sexual risk factors were more common in men who migrated than those that did not (International Institute for Population Science (IIPS) & Macro International 2007). Similarly the highest proportions of men describing paying for sex in the NFHS-3 were those that were away from home for more than a month at a time in the past 12 months and men not staying with their spouse (International Institute for Population Science (IIPS) & Macro International 2007).

Like other high risk groups, short term migrants are very difficult to capture in a household survey or census. Understanding the sexual networks of this potential bridge population remains a poorly described aspect of the Indian epidemic (Halli et al. 2007). A recent study of migrants in northern Karnataka found that recent male migrants are likely to have both casual and transactional partners whilst away from their families. Condom use with known sex workers was high. However, men were less likely to use condoms with non-marital sex partners that they did not perceive to be sex workers, even though cash transactions commonly followed the sexual encounter. Multiple partners in different work locations as well as home villages and concurrency were common (Karnataka Health Promotion Trust (KHPT) & Population Council 2008). Similarly, the IBBA survey of 11219 male migrants found that over half of migrant workers were married one third of which resided away from their spouses. Although sexual contact with women they described as sex workers was commonly reported, they also commonly

reported sexual contact with non-spousal, non-paid female partners both at place of origin and place they had migrated to (Saggurti et al. 2008).

2.3.2.3.2 Migrant female sex workers as bridge population

There are a handful of studies of migration of female sex workers (FSWs) that suggest that their mobility is heterogeneous; for example the majority of large urban red-light areas, such as Mumbai sex workers, are migrant, whilst village-based traditional devadasi sex workers are often local women (Blanchard et al. 2005). The baseline report of Payana, a large cohort study to understand the migration patterns of rural female sex workers in northern Karnataka, confirms the complexity of movement in female sex workers, with at least three different patterns of mobility described; ‘local sex workers’, who live and practice in their village; ‘mobile sex workers’, who practice sex-work outside the village, for less than two weeks, and within the same district; and ‘migrant sex workers’ who spend more than two weeks in one year practising sex-work outside of their district. The majority of migrant sex workers went for long durations to brothel-based sex-work in Pune, Sangli, Mumbai, and Bhiwandi, in Maharashtra. The majority of mobile sex workers, on the other hand, paid multiple brief visits to the same location (University of Manitoba & Karnataka Health Promotion Trust 2008). Drivers of this mobility seem to be both historical links, e.g. between coastal Andhra Pradesh and the brothels of Mumbai and (previously) Goa, or economic (Chandrasekaran et al. 2006). Moreover, the stigma associated with sex work makes anonymity a factor for many migrant sex workers (Scambler & Paoli 2008). There are varying vulnerabilities associated with mobility. Migrant sex workers were younger and started sex-work at a

younger age and had lower levels of literacy (University of Manitoba & Karnataka Health Promotion Trust 2008). Non-local sex workers in northern Karnataka had higher HIV prevalence than local sex workers (Indian Council of Medical Research & Family Health International 2007). The Payana study suggests that migrant sex workers from northern Karnataka work in brothel-based red-light areas where client load and HIV prevalence is high. Although condom use is also high, their membership of collectives at destination is low and they report high levels of police harassment at destination. Over the longer term, migrant and mobile sex workers may settle back into their villages and practice. Therefore, the impact of sex worker migration on local transmission dynamics is cumulative (University of Manitoba & Karnataka Health Promotion Trust 2008).

2.3.2.3.3 Truckers

Long distance truck drivers are a special case of mobile men with well-defined mobility patterns. There are three million trucks with a driver and a young male helper working on the roads of India. Nearly half will work long distance routes and stay away from home for one month or more. The vulnerability to HIV of this group was recognised early in India's epidemic and consequently they are one of the better described migrant male groups. Surveys have suggested that between a quarter and a third of long distance truck drivers report commercial sex contact in the previous year (Chandrasekaran et al. 2006; National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001). HIV prevalence from a variety of convenience and sentinel sites is estimated to be between 4 and 19 % (Bal et al. 2007; Chandrasekaran et al. 2006; Gawande et al. 2000; Jindal et al. 2008; Manjunath et al. 2002; National AIDS Control

Organisation, Ministry of health and Family Welfare, & Government of India 2006; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007; Pandey et al. 2008). Sentinel surveillance also suggests that women whose spouses are transport workers are at higher risk for HIV. Women, who provide transactional sex for long distance truck drivers, either solicit directly on the national high ways, or indirectly through the restaurants and other food outlets that truck drivers frequent (Biswas et al. 1999).

2.3.3 Tackling the epidemic

2.3.3.1 National AIDS Control Programme 3rd five year plan

The overall goals of NACP-III is to halt and reverse the epidemic in India over the next five years by integrating programmes for prevention, care and treatment. This is to be achieved through a four-pronged strategy:

1. Prevent infections through saturation coverage of high-risk groups with targeted interventions and scaled up interventions in the general population.
2. Provide greater care, support and treatment to larger number of People Living with HIV.
3. Strengthen the infrastructure, systems and human resources in prevention, care, support and treatment programmes at district, state and national levels.
4. Strengthen the nationwide Strategic Information Management System.

2.3.3.2 History of HIV prevention in India

This section is abridged from a review prepared jointly by the National AIDS Control Organisation and Bill and Melinda Gates Foundation (Chandrasekaran et al. 2006) and National AIDS Control Organisation's annual reports and five year plans. (National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2006; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007) HIV surveillance in India was first started by Indian Council for Medical Research in 1987 amongst blood donors and STD clinic attendees. In 1990 the first medium-term plan was devised with a focus on four high-risk cities.

In 1992 the National AIDS Control Organisation was set up. The National AIDS Control Programme devised its first five year plan, funded by the World Bank. The State AIDS Control Societies were initiated throughout India. However, funds were mainly spent in Maharashtra, Tamil Nadu and West Bengal. In 1994, 52 sentinel sites were chosen and the first national estimates of HIV were made.

In 1999 the second National AIDS Control Plan (NACP II) was launched. The core strategy for this five year plan was targeted interventions for high risk groups. The strategy had five key areas: behaviour change communication, peer education, improved STI diagnosis and treatment, condom promotion and creating an enabling environment with community mobilisation. By 2005 there were 965 targeted interventions in place

nationally. However, only one third of these targeted the high-risk groups as designated by NACP II.

Expenditure on HIV prevention per capita was also very low. In 2004 it was \$0.15 per head of adult population compared with \$1.74 in Thailand. This has to be seen against the backdrop of overall low government expenditure on health care (\$7 per capita) and heterogeneity of funding across states

Independent assessments of HIV prevention programmes in 2002 and 2003 identified several shortcomings (Chandrasekaran et al. 2006; Options consulting & Development Fund for International Development 2003). These were rigidity of funding leading to inflexibility on the ground and poor utilisation of funds, lack of coordination at a state level, poor coverage and substantial proportion of interventions aimed at non-priority groups. The report noted that there were limited interventions to improve STI care particularly in women, and there was a need for structural interventions to change environmental factors and foster community-led responses (Blankenship et al. 2006; Parker et al. 2000). There were limited interventions for male clients of FSWs and inadequate evaluation of effectiveness. In 2003, coverage of high risk groups, even in high prevalence states was as low as 12% in Karnataka and 40% in Tamil Nadu. Estimating coverage in the medium and low prevalence states was even harder to gauge as there were no good estimates of the size of the high risk groups. Social marketing of condoms was also very slow to take off with growth in condom sales of around 6% a year.

More recently, India's National AIDS Control Programme has been praised for its coordinated response to the HIV epidemic and demonstrable reductions in HIV prevalence in the southern and western high prevalence states (Piot et al. 2008). One particular feature of tackling the epidemic in India has been the formative role of the voluntary and non-governmental sectors, which may in part explain some of the state to state variation in the response. Examples of organisations that have successfully harnessed the activities of community based organisations in order to prevent HIV are the AIDS Prevention and Control Project in Tamil Nadu, and Karnataka Health Promotion Trust.

2.3.3.3 Impact of HIV prevention programmes

Coverage of high risk groups, particularly in medium and low prevalence states remains suboptimal. NFHS-3 suggests that HIV knowledge remains low. Nationally only 17% of women and 33% of men have comprehensive knowledge of HIV; 1 in 8 women knew that consistent condom use prevents HIV; 40% of currently pregnant women knew that HIV can be transmitted from mother to her baby; and 15% knew that this could be prevented through the use of drugs. Only 3% of women and 4% of men had ever tested for HIV. Stigma is high with only one in three expressing accepting attitudes on four indicators: willing to care for relative with HIV, willing to buy fresh vegetables from a vendor with HIV, willing to allow a female teacher with HIV to teach, and keeping secret a family member with HIV (International Institute for Population Science (IIPS) & Macro International 2007).

However, despite uncertainties about the robustness of the data, particularly earlier in the epidemic, there are indications that there has been a decline in HIV prevalence overall in India. This decline has been most marked in the antenatal clinic (ANC) and sex worker surveillance data from southern India, thought to be a result of the widespread-targeted interventions in these states. Declines from 1.7% to 1.1% in women aged 15-24 -chosen as a surrogate for recent infection with HIV- between 2000 and 2004 have been reported in south India (Kumar et al. 2006). It is likely that these reductions in aggregate data are a result of marked reductions in prevalence of HIV in Tamil Nadu in particular (Kang et al. 2005; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007; Solomon et al. 1998; Thomas et al 2002). Moreover, in contrast to elsewhere in India, the antenatal clinic surveillance data in Tamil Nadu is fairly representative of general population data and so the declines in ANC data probably reflect real declines in prevalence (Kang et al. 2005). The latest NFHS-3 survey found that population prevalence in Tamil Nadu was 0.34% and no longer above the all India prevalence (International Institute for Population Science (IIPS) & Macro International 2007). There are suggestions that early intervention and collectivisation of sex workers in West Bengal averted an HIV epidemic in this state (Gangopadhyay et al. 2005; Jana et al. 1998; Jana & Singh 1995). More recent data emerging from Karnataka suggests that the widespread targeted intervention reaching more than 700,000 female sex workers have resulted in reductions in bacterial STIs, a marker of recent sexual risk in sex workers (Reza-Paul et al. 2008).

Whether this decline is a result of the early and coordinated response with wide-scale targeted interventions and surveillance as opposed to secular changes is difficult to disentangle. A recent ecological analysis compared 18 districts in Karnataka that had a more intensive HIV prevention intervention (IPI) with those that did not. They found that between 2003 and 2007 there was a standardized overall decline in HIV among 15-24 year old ANC attendees of 56% in the IPI districts compared with 5% in the non-IPI districts, suggesting that some of the reductions can be attributed to the targeted HIV prevention interventions (Moses et al. 2008). On the other hand mathematical models have suggested that, even with 100% coverage of high risk groups the observed reductions in HIV prevalence would be unlikely (Boily et al. 2008).

Despite the optimistic news from some of the high prevalence states with the largest and most long-standing targeted interventions, there are concerns about rising prevalence among high risk groups in other settings (National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007). At the same time that the prevalence in IDUs in the northeast has been dropping, the prevalence in sex workers in the same area has been increasing (Agarwal et al. 1999; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007). Similarly the prevalence in IDUs in all the southern states is rising, while trends in MSM have shown no change.

Given the effectiveness of the sex worker interventions in south India and IDU interventions in northeast of India (National AIDS Control Organisation (NACO) &

National Institute for Health and Family Welfare (NIHFW) 2007) there is an urgent need to expand coverage and improve surveillance in the high-risk groups in the remaining states of India. There is also a need to better understand the ways in which societal factors, such as migration, traditional sex-work and gender disadvantage; individual sexual behaviour; and biological factors, such as the prevalence of HSV-2 and circumcision, have contributed to the huge geographical variations in HIV in India.

2.4 Challenges to HIV prevention in sex workers

There is growing evidence that a range of psychosocial and community-led processes underlie an individual's ability to access and adopt behaviours such as "abstinence, being faithful and using a condom" (Blanchard et al. 2005; Blanchard et al. 2007; Campbell 2000; Kerrigan et al. 2003). Acknowledging the role of structural factors in sexual behaviour change has led to concepts such as "high risk environments" replacing "high risk groups" (Desmond et al. 2005; Gupta et al. 2008; Wight et al. 2006). The role of structural factors has variously been described as, a continuum of risk depending on the proximity of structural factor to the outcome (Barnett & Whiteside 2002), or, alternatively using hierarchical conceptual frameworks, that define levels of "risk causation" e.g. societal (super-structural), community (structural), institutional (infrastructural), and individual (Boerma & Weir 2005; Sweat & Denison 1995). These theoretical frameworks enable us to describe upstream contextual factors determining, for example, sex workers' sexual risk behaviours and tailor interventions to alter the "risk environment". An example of this type of evidence-based approach can be seen in the Avahan programme in northern Karnataka, where the finding that traditional "devadasi"

sex workers are more stable, experience less violence and stigma, and are less likely to be controlled by pimps and brothel owners, informed collectivisation of the sex workers as a more appropriate strategy than targeting gatekeepers (Blanchard et al 2007; Halli et al. 2006; O'Neil et al. 2004).

A recent Lancet series on HIV prevention divides the current arsenal of HIV prevention tools into structural interventions (Gupta et al. 2008), behavioural interventions (Coates et al. 2008), and biological interventions (Padian et al. 2008). However, the emphasis throughout this series is on the synergistic effect of combining structural, behavioural and biological interventions for maximum effect (Bertozzi et al. 2008; Merson et al. 2008; Piot et al. 2008). For example, a microbicide that reduces the risk of HIV acquisition in female sex workers by half would still require behavioural interventions to prevent risk compensation, and an enabling environment to ensure that the female sex workers have a sustainable access to and are able to use the new technology. In other words, even effective biological interventions such as condoms and circumcision, may require synergistic interventions at the level of society (structural), or community (participation and empowerment) or the individual (cognitive and behavioural) (Boerma & Weir 2005).

The 100% condom use programme in Thailand is an example of an intervention at societal level; state apparatus was utilised to penalise “high risk behaviours” and encourage “low risk behaviours” (Hananberg & Rojanapithayakorn 1996; Hanenberg et al. 1994). Although the impact and effect was mediated through changes at the community and individual level, the site of the intervention was societal. Interventions

implemented through community mobilisation, such as the Sonagachi Project, are examples of interventions at a community level, and in their idealised form lead to gradual shifts in socially acceptable behaviours (Jana et al. 1998). The seemingly democratic nature of change that community action implies has led to widespread endorsement of empowerment as part of health promotion (Campbell 2000; Halli et al 2006).

If empowerment is a process of politicisation, wherein a sex worker moves from consciousness, to knowledge to action (i.e. group identity to efficacy to agency), the role of the social context becomes immediately apparent. On the one hand the very conditions of marginalisation and violence could constitute insurmountable barriers to empowerment (Asthana & Oostvogels 1996). On the other hand studies suggest that sex workers are able to express their agency, albeit through small and incremental gains (Campbell 2000; Cornish & Ghosh 2007). A study of 800 female sex workers in Andhra Pradesh suggests that collective agency and collective identity were both predictors of consistent condom use; however, collective agency had a stronger effect. However, women who had the greater economic power, defined as control over type of sex and amount they charge were also more likely to use condoms (Blankenship et al. 2008). There is therefore a complex and dialectical, rather than mechanical and unidirectional relationship between society, community and the individual.

Despite the National AIDS Control Programme's commitment to community mobilisation as a HIV prevention strategy, collectivised and empowered sex workers are

still not the majority. This failure reflects the tension between the two opposing philosophies, harm reduction versus prohibition. Policy makers and public often prefer the quick fix allure of the latter. Sex-work in particular is an emotive subject, often condemned by forces as seemingly disparate as the religious conservatives - indignant at the affront on sexual morality - and social reformists – angered by the exploitation and ‘degradation’ of women “trafficked” for the sex industry (Corbin 1990; Hershatter 1992; Walkowitz 1980). Public health interventions that target disenfranchised groups, such as sex workers, inadvertently create scapegoats for such coalitions of prohibitionists to pursue.

As discussed previously, transactional sex is not illegal in India, however sex-work carried out in a brothel or within 200 metres of certain public places, is a criminal offence. On 14th June 2004, the Government of Goa demolished Baina red-light area (Shahmanesh & Wayal 2004). Since the demolition of Baina several high profile closures of red-light areas and dance bars have taken place in India. In all cases, the settings were governed by populist religious (Hindu) fundamentalist political parties at the time of the closures and evictions - the Bharatiya Janata Party (BJP) in Surat, Goa, and now Karnataka, and the Shiv Sena party in Mumbai. In most of these cases the public reaction was mixed, with many, including social reformists, supporting the abolitionist actions (Prayas 2005; Research Centre for women's studies 2005). Although anti-prostitute, anti-migrant and public health rhetoric was used to justify the demolitions and evictions, they were only possible because of the ambiguous legislation around sex-work, which will be compounded further by criminalisation of purchasing sex.

2.5 HIV in Goa

Goa is a small coastal state with a population of 1.37 million (Government of India 2001). Goa is a relatively wealthy state that performs well on most of the socioeconomic and health indicators (Government of India 2001; International Institute for Population Science (IIPS) & Macro International 2007). Since liberation from Portuguese rule in the early 1960s Goa has experienced an exponential growth in its population, almost entirely due to in-migration. In addition to this long-term migration there is a substantial amount of seasonal and short term movement of people into the State. Goa's main economy consists of tourism, fishing and mining (Government of Goa 2007). Goa has more than 1.5 million domestic and international tourists, annually. Between the months of



November and March Goa can almost double its population with the tourist and the tourism related seasonal migrants. Even outside of tourist season almost half the population of Goa is made up of long and medium term migrants; making Goa one of the states in India where migration is the main source of population growth (Government of India 2001). The majority of migrants come from the neighbouring

states of Karnataka (>60%) and Maharashtra to work in tourism-related industries and the concurrent boom in construction. The city of Vasco da Gama is one of the largest ports

on the West coast of India, and therefore there is also a large thoroughfare of around 50,000 truckers annually along the two national highways (NH4 and NH17) that transect the state. The dramatic emergence of a densely populated, urbanized, multi ethnic coastal Goa, from the largely agrarian, fishing community of the late 70s heralds the rapid social changes that are currently being observed throughout India and has a bearing on the emergence of HIV.

The most recent estimates of HIV prevalence in India show that Goa is remarkably similar to its two large neighbouring states of Maharashtra and Karnataka. The prevalence of HIV in Goa is estimated to be 0.73% compared with 0.81% in Karnataka and 0.74% in Maharashtra (International Institute for Population Science (IIPS) & Macro International 2007; National AIDS Control Organisation (NACO) & National Institute for Health and Family Welfare (NIHFW) 2007). Goa is in the concentrated phase of the epidemic with sentinel surveillance suggesting HIV prevalence in high-risk groups such as FSWs (30-50%) and STD clinic attendees (10%), whilst the HIV prevalence in the ANC attendees remains under 1% (Goa State AIDS Control Society (GSACS) 2007).

There are limited data on other high risk groups. However, the concentration of AIDS cases in the coastal areas with high levels of migration for work suggests that, as elsewhere in India, this group are also vulnerable and are especially important in view of their potential role as a bridge population (Goa State AIDS Control Society (GSACS) 2007). Data from a mapping exercise conducted in 2004 confirmed the vulnerability of these migrant workers. Migrant workers were described as being predominantly men

who had migrated for the first time before the age of 21 and shared their living space with 3-5 other men. They reported high levels of high risk sexual behaviour as well as knowledge of sex access points (International Institute for Population Sciences (IIPS) 2004). Apart from the truckers, knowledge regarding HIV is low as was self-reported condom use (Bailey & Hutter 2008). There are also anecdotal reports of men in the tourist industry exchanging sex for money with both male and female tourists.

Consequent to this large thoroughfare of seasonal visitors, Goa had a large population of over 2000-3000 FSWs from Andhra Pradesh and Karnataka. Prior to 2004 this relatively homogeneous population of brothel-based FSWs lived and worked in Baina red-light area. Baina beach, situated in Goa's largest port, Vasco da Gama, had been a renowned red-light area since the early 1960s. By 2003 this small, well-demarcated area of 0.09km² had become home to 6,000 - 7,000 people and around 2,000 – 3,000 brothel based FSWs. Although this area had started as an illegal slum, by 2004 it had developed into an intricate network of alleys with permanent and semi-permanent concrete structures; which bore a remarkable resemblance to the brothel areas in neighbouring northern Karnataka (personal observation on a field visit 2008). Bars and restaurants lined the beach, and the municipality provided water and electricity for the inhabitants of Baina. The majority of people living in Baina had migrated in different waves from neighbouring Karnataka and more distant Andhra Pradesh. Nevertheless, many had resided in Baina for more than three decades.

Figure 2-4: Baina after the demolition



Over the decade preceding the demolition there had been a growth in HIV prevention interventions targeting Baina-based sex workers. The HIV prevention intervention that had started in the early 90s as a small scale behavioural intervention delivered through Positive People, the oldest HIV non governmental organisation (NGO) in Goa, was scaled up during NACP II. By 2004 the women were exposed to HIV prevention interventions implemented through four NGOs, funded by the National AIDS Control Organisation, and two internationally-funded NGOs. The HIV prevention interventions they provided were a composite of sexual risk reduction counselling delivered through outreach workers and trained peer educators, provision of condoms and referrals of symptomatic women for treatment of sexually transmitted infections. There was also one NGO involved in skills training, rehabilitation and rescue of minors and trafficked women. Routine surveillance suggested a pre-demolition HIV prevalence of 25-50% in Baina sex workers (Goa State AIDS Control Society (GSACS) 2007) and high levels of HIV awareness and condom use (National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001).

HIV prevention in Goa was limited in scope and had not been subject to rigorous evaluation. The most extensive programs were those described above with FSWs and truckers who showed evidence of high levels of knowledge about HIV and high levels of self-reported condom during both the 2001 national behaviour survey and the 2004 mapping of high risk groups (International Institute for Population Sciences (IIPS) 2004; National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001). There were very few interventions amongst migrant workers working in the tourist industry, fishing industry and construction (International Institute for Population Sciences (IIPS) 2004). The number of people attending government sexual health clinics and HIV voluntary testing and counselling services had not increased over a decade (Goa State AIDS Control Society (GSACS) 2007).

On 14th June 2004, following a High Court order, the Government of Goa demolished the red-light area. The process culminating in the demolition had been set in motion the previous year. July 2003 saw the withdrawal of alcohol licences from the bars and restaurants along Baina beachfront. At Christmas 2003, a police cordon was placed around Baina that effectively stopped clients from entering the red-light area. Although NGOs mounted a campaign to repeal the High Court order, or ameliorate its effects, they were constrained by their own ambivalence towards sex work. In June 2004, the red-light area was formally demolished, no rehabilitation or relief was provided for the women and a decade of HIV prevention activities was brought to an abrupt close (Shahmanesh & Wayal 2004; Sharma 2004).

At the time of the demolition I was engaged with the NGO Positive People in a research project to develop a participatory evidence-based HIV prevention intervention. It became quickly apparent that the dispersion and marginalisation of the women following eviction would impact upon the type of HIV prevention interventions that could be implemented. Consequently we worked closely with the Baina sex workers to adapt the aims and objectives of the study to the new environment. The original aim of the study, ‘to work closely with the sex workers to develop an evidence based HIV prevention intervention’ was thus modified to more explicitly explore describe the way in which individual, community and societal factors interact to shape female sex workers vulnerability to HIV in Goa, and was expanded to also include the impact of prohibitive policies on sex workers ‘risk environment’ in order to inform the intervention design and to create an evidence-base to inform the public debate. The specific objectives (1.7) were therefore modified as follows; objectives a, b and e were added, replacing two of the original objectives, i.e. a detailed description of female sex workers health seeking strategies and evaluating point of care tests for gonorrhoea, chlamydia and syphilis.

2.6 Summary points

- Heterogeneity and uneven growth has resulted in large scale rural-urban and seasonal migration in India
- Gender disadvantage is common and associated with gender based violence and lack of autonomy

- India's epidemic is concentrated in groups with higher rates of risk behaviour, i.e. core groups. Targeting core groups such as female sex workers is pivotal to HIV prevention in India.
- Collectivised and empowered sex workers remain the exception rather than rule. This may be results of failure to tackle societal factors, and specifically gender disadvantage and sex work legislation.
- There is a dearth of data in Goa, an epidemiological hot spot, on the size of high-risk groups, the epidemiology of HIV and STIs, and how the individual and structural factors interact to shape vulnerability to HIV.
- Against this background the government of Goa demolished the red-light area and brought a decade of HIV prevention to an abrupt close.

2.7 Specific objectives

- a. To systematically review the evidence for HIV and STI prevention interventions in female sex workers in middle and low-income countries.
- b. To describe the course of events in Goa relating to the demolition, with a particular focus on those aspects that affects the practice of sex-work, the sex workers collective identity, their sexual health and the overall 'risk environment'.
- c. To characterise female sex workers in Goa in terms of their i) demographic characteristics, ii) migration patterns, iii) temporal, spatial and behavioural mapping including sexual networks with paying and non-paying partners iv) psychosocial health v) disempowerment and gender disadvantage v) health seeking strategies

- d. To measure in female sex workers i) prevalence of STIs and HIV ii) rate of symptomatic and asymptomatic genital infection.
- e. To explore the relationship between the underlying social and the proximal behavioural and sex-work determinants of infection.
- f. To design, in collaboration with the sex workers, a peer-driven HIV prevention intervention for sex workers

3 HIV prevention for female sex workers in resource poor setting

3.1 Introduction

The Lancet series on HIV prevention interventions, having sub-divided them into structural (Gupta et al. 2008), behavioural (Coates et al 2008) and biomedical (Padian et al. 2008) interventions, suggested that the evidence supports combination HIV prevention tailor made to the context (Bertozzi et al. 2008; Merson et al. 2008; Piot et al. 2008). Prior to this several systematic reviews had studied the effectiveness of HIV prevention strategies at both an individual and population level. One concluded that well designed condom promotion interventions that targeted core-groups (groups with high rates of partner exchange) are effective (Merson et al. 2000). A Cochrane review of sexually transmitted infection (STI) control concluded that, with the exception of the trial of syndromic management of STIs in Mwanza (Grosskurth et al. 1995), there is limited evidence from randomised controlled trials (RCT) for STI control as an effective HIV prevention strategy (Sangani et al. 2004). A systematic review of STI prevention interventions found that just over half of forty-one interventions identified were effective at reducing STIs (Manhart & Holmes 2005). Authors of a systematic review of structural facilitators and barriers to HIV prevention recommend that interventions should alter the macro-social determinants of risk, such as economic policy, migration, gender inequality and sex-work legislation (Parker et al. 2000).

Mathematical models suggest that targeting core-groups, such as female sex workers, is an effective way to reduce HIV transmission, particularly in the early and accelerated phase of the epidemic (Aral & Blanchard 2002; Boily et al. 2002). Two important position papers have sought to summarise key strategies for HIV prevention in sex workers. The first approached HIV as an occupational hazard of sex-work and consequently, advocated harm reduction strategies. These included empowering sex workers to use condoms, and, removing structural barriers to safety (Rekart 2005). The other comprehensively reviewed the various strategies to provide STI treatment for sex workers and concluded that, using presumptive periodic treatment with single dose antibiotics, followed by regular algorithm-driven screening, was likely to be the most effective strategy (Steen & Dallabetta 2003). The effectiveness of either harm-reduction or STI treatment as an HIV prevention intervention for sex workers has not been systematically assessed.

The aim of this chapter is to present the findings of a systematic review of the evidence for the effectiveness of HIV and STI prevention interventions, in female sex workers (FSW), in resource poor settings.

3.2 *Materials and methods*

3.2.1 Inclusion criteria

Any intervention which intended to prevent HIV and STIs through targeting female sex workers in resource poor settings, and which was evaluated in an experimental (RCT) or quasi-experimental study (controlled but without randomly assigned control groups, or, time-series) was eligible for inclusion. Study participants were limited to

FSWs, defined as women who exchange sex for money or other gifts and commodities. Studies were only included if they reported at least one outcome measure that could be externally validated (Peterman et al. 2000; Zenilman 2005). This included biological outcomes (HIV incidence and/or STI incidence/prevalence), or measurable health outcome (e.g. condom disposal, health service utilisation). Studies were excluded if they targeted male and transsexual sex workers, were conducted prior to the advent of HIV, were based in the advanced industrial countries⁴, the focus was harm reduction for injection drug users, the intervention was not adequately described, or the duration of intervention was less than six months.

3.2.2 Search strategy

Databases searched are listed in Table 3.1. Medline and Embase were searched using the Key Mesh terms and text words (in italics): [Prostitution OR *prostitut** OR "*sex work**"] AND [HIV OR HIV infection OR HIV seroprevalence OR *HIV* OR sexually transmitted disease OR "*sexually transmitted infection*"]. The text words were used to search the other databases. A key non-indexed journal, 'Research for Sex Work' (www.researchforsexwork.org) and references of review articles and selected studies were hand searched. Web sites of agencies involved in HIV-prevention (UNAIDS, Family Health International, and Population Council) and conference abstracts (through Gateway, National Library of Medicine) were searched. First authors and experts in the field were contacted to obtain information on unpublished work, forthcoming manuscripts and research in progress. Unpublished studies and studies published in non-English languages journals were considered for inclusion.

⁴ USA, Canada, Western Europe, Japan, Australia and New Zealand.

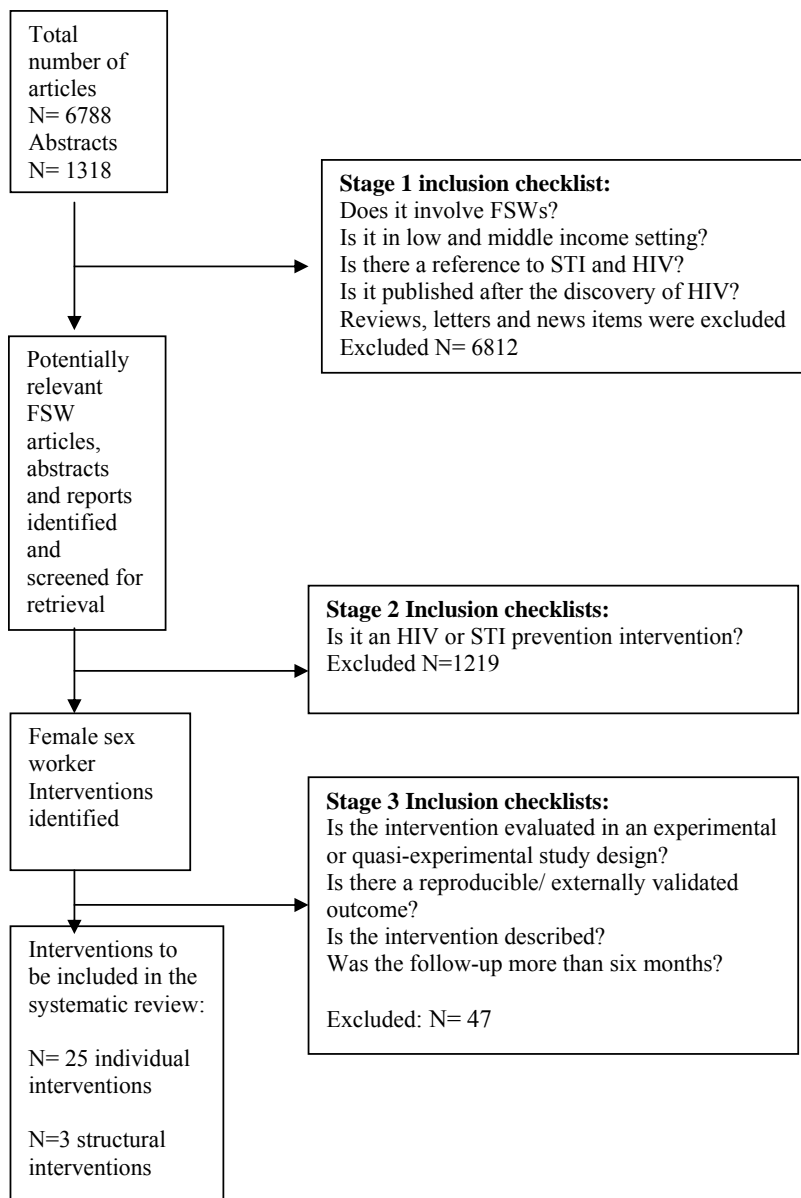
Figure 3-1 Data bases and years searched for the systematic review of HIV prevention in FSWs

Database	Years searched	Date last search performed	Number of articles identified
Cochrane controlled trial register and Cochrane database of systematic reviews	1998-2006	July 2006	41
Embase	1980-2006	June 2006	1912
Medline	1966-2006	June 2006	2175
Web of Science	1984 -2006	July 2006	2660

3.2.3 Review methods

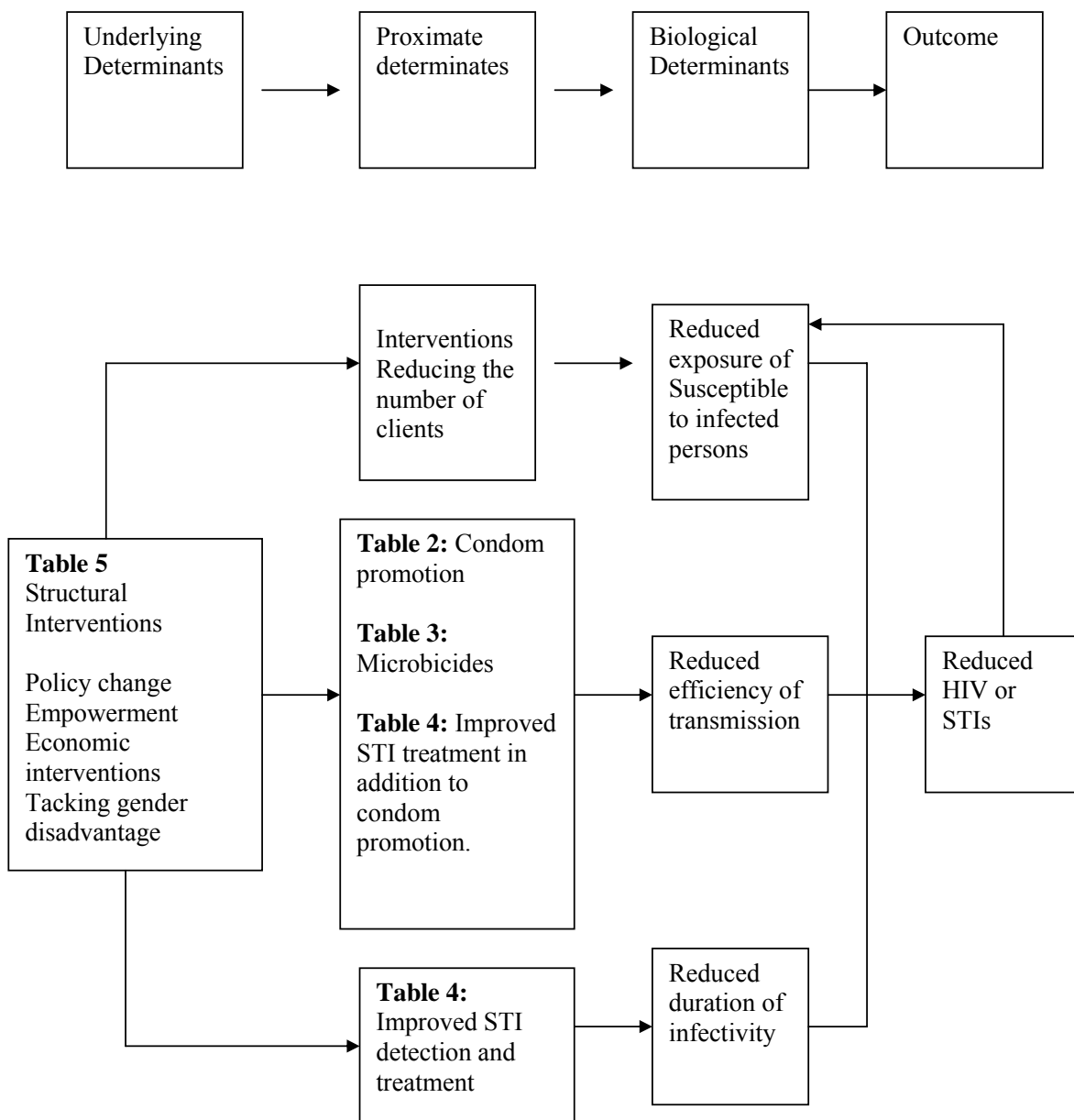
Titles and abstracts were entered into Reference Manager Professional Version 10 (ISI ResearchSoft, USA) and screened in three stages using a ten-item checklist (see figure 3.1).

Figure 3-2 Flow chart: Selection of interventions for the systematic review of HIV prevention in FSWs



Data from studies that met the inclusion criteria were extracted using a data collection form. Heterogeneity of interventions precluded a summary statistic of effectiveness. Instead, the qualitative results were summarized in tables categorized by main intervention focus and outcome. The interventions are classified according to the conceptual framework presented in Figure 3.3. The order in which the studies are reported in the tables reflects their methodological rigour.

Figure 3-3: Conceptual framework for examining the interventions to prevent HIV and STIs in female sex workers in resource poor setting



3.3 Results

3.3.1 Interventions Characteristics

Of 6,788 articles and 1,318 abstracts (including duplicates) identified across databases 1,272 were related to HIV and STIs in FSWs in resource poor settings. Hand searching references and journals, searching websites and conferences, and contact with experts identified a further 22 studies. The flow chart (Figure 3.1) shows that from the relevant articles located, 26 published and 2 unpublished studies met the inclusion criteria.

3.3.1.1 Study populations

Twenty-five studies were conducted with FSWs; one with couples (transactional and non-transactional sex partners) visiting a motel; two studied interventions with high-risk women associated with mines and truck stops. Four studies evaluated the effect on clients.

3.3.1.2 Study settings

Sixteen (57%) of the studies were in Africa and the remainder were in Asia (n=8) and Latin America (n=5). Eleven (39%) were in dedicated sex worker clinics; the remainder were conducted in brothels (n=7), communities (n=7), motels (n=1) or truck stops (n=1).

3.3.1.3 Study design

Eleven studies (39%) were RCTs, three of which were cluster-RCTs. Seventeen (61%) were quasi-experimental including uncontrolled before-and-after studies (n=11), studies with a non-randomised control arm (n=3), or a combination of both (n=3).

3.3.1.4 Interventions evaluated

Seven studies (25%) evaluated interventions to increase condom use. Four (14%) evaluated the efficacy of the vaginal microbicide nonoxinol-9 (N-9). Fourteen (50%) evaluated a combination of a behavioural intervention and STI treatment, six of which were able to separate out the effectiveness of adding the STI treatment component. Three (11%) structural interventions were multifaceted, with improved STI care and an enabling atmosphere for risk reduction either through community mobilisation or political/legal sanction.

3.3.1.5 Outcomes

Twenty-six (93%) assessed changes in incident or prevalent HIV or STIs, of which 12 measured HIV incidence. Other outcomes were verifiable measures of condom use such as provision, disposal or use with simulated clients (n=4), and service utilisation (n=2).

3.3.2 Summary of findings

3.3.2.1 Health education and condom promotion (table 3.1)

There were only two RCTs, which examined the effect of behavioural interventions combined with condom promotion. In Madagascar the addition of clinic-based risk-reduction counselling to community-based peer-counselling were examined and, resulted in reductions in incident STIs corresponding to increased self-reported condom use (Feldblum et al. 2005). An RCT in Nicaragua found that condoms placed in the rooms or handed to clients were more likely to be used than if made available at reception. Paradoxically, condoms were less likely to be used in the presence of educational material in the rooms (Egger et al. 2000).

Two non-random-cluster-CT looked at the impact of peer education and condom provision in brothel-based FSWs in India (Bhave et al. 1995) and Singapore (Archibald et al. 1994; Wong et al 1998; Wong et al 2004). They found reductions in incident HIV and STIs (India) and gonorrhoea (Singapore), which corresponded to increased condom use. Another non-random cluster controlled trial, compared three risk reduction sessions to one session per 6 months and found a lower STI risk in the intervention arm that was not sustained over time (Ford et al. 2000a; Ford et al. 2000b; Ford et al. 2002).

3.3.2.2 Female controlled methods (table 3.2 & 3.3)

One cluster-RCT with only 25% follow-up in Thailand (Fontanet et al. 1998) and one longitudinal study in Madagascar (Hoke et al. 2007) examined the effect of adding female condoms to ongoing programmes. Both found a shift to female condom use,

which corresponded to a decrease in STI prevalence in Madagascar. Four placebo-controlled RCTs examined different doses of the vaginal microbicide N-9 delivered in a variety of ways (Kreiss et al. 1992; Richardson et al. 2001; Roddy et al. 1998; Van et al. 2002). They showed either no effect or an increased risk of HIV.

3.3.2.3 Treatment of bacterial sexually transmitted infections combined with behavioural interventions (table 3.3)

Three RCTs tested the effectiveness of different STI treatment strategies for FSWs, in two of which the primary outcome was incident HIV. The groups in Nairobi (Fonck et al. 2000; Kaul et al. 2002; Kaul et al. 2004) and Benin/Ghana (Labbe et al. 2006) looked at the effect of presumptive periodic treatment, whilst the group in Cote d'Ivoire (Ghys et al. 2001) tested regular screening for STIs. Neither the Cote d'Ivoire nor Nairobi studies found a difference in HIV incidence between the arms. In Cote d'Ivoire the follow-up was less than 50%. The study of presumptive periodic treatment in Nairobi was the only one that reported significant reductions in bacterial STIs in the intervention arm.

A quasi-experimental study of presumptive periodic treatment in South Africa found reductions in STIs in FSWs after the introduction of the intervention and an inverse relationship between distance from intervention and genital ulcer disease in miners (Steen et al. 2000). Only one third of the women were followed-up over the nine months. An intervention in Nicaragua found that STI treatment vouchers, redeemable at quality approved clinics led to significant drops in STIs in the FSWs. This intervention, that in effect provided presumptive treatment to half of the known

FSWs, showed more substantial reductions in prevalence of STIs, if the rounds of voucher distribution were less than 6 months apart (Borghi et al. 2005; Gorter et al. 2005; McKay, Campbell, & Gorter 2006). A cluster RCT comparing STI treatment delivery systems found that high-risk women at truck-stops preferred dedicated outreach clinics to primary health care centres (Nyamuryekung'e et al. 1997).

Four cohort studies examined the effect of regular STI screening, peer education and condom promotion. In Zaire (Laga et al. 1994) and Nairobi (Ngugi et al. 1988; Ngugi et al. 1996) they examined the effect on incident HIV whilst in Peru (Sanchez et al. 2003) and China (Ma et al. 2002) the primary outcome was incident STIs. Only the Chinese cohort reported the loss to follow-up, which was 50%. All interventions showed an increase in self reported condom use that corresponded with a reduction in incident HIV and/or STIs.

Four studies from Cote d'Ivoire (Ghys et al. 2002), Benin (Alary et al. 2002), Bolivia (Levine et al. 1998), and South Africa (Williams et al. 2003) compared the situation before and after introducing similar combinations of peer education, condom promotion and regular STI care. In South Africa this was part of a larger intervention that also targeted miners and youth. Only Cote d'Ivoire and Bolivia reported their response rates, which were 90% and 80% respectively. Bacterial STI prevalence dropped in all sites except for South Africa where it paradoxically rose despite increased condom use.

3.3.2.4 Structural interventions (Table 3.4)

The best described structural intervention has been the Thai 100% condom program (Hananberg et al. 1994; Rojanapithayakorn & Hanenberg 1996; Visrutaratna et al. 1995). The countrywide, government-led project, improved access to affordable STI treatment, and increased condom use, through changing social norms, and imposing sanctions on dissident sex-work establishments. Although there is no control group, various indicators suggest an impact, namely increased condom supply, an 80% reduction in the five major STIs in men (Hananberg et al 1994), and ten fold decrease in STI incidence in new military recruits (Celentano et al. 1998; Nelson et al. 1996). There has been a failure to demonstrate the same magnitude of effect in FSWs (Kilmarx et al. 1998; Kilmarx et al. 1999).

Another well-described structural intervention was the empowerment of FSWs in the Sonagachi red-light area in India. Politicised and empowered FSWs created an environment conducive to condom use and improved STI care through community mobilisation and collective bargaining with structures of power (police, brokers and brothel-owners). Again without a control arm the impact of the intervention cannot be quantified; however, HIV prevalence amongst the FSWs of Sonagachi remains in single figures compared with prevalence of over 50% reported from similar settings elsewhere in India. A three to five fold reduction in prevalent STIs was documented (Chakraborty et al. 1994; Das et al. 1994; Jana et al. 1994; Jana et al. 1998; Jana et al. 2004; Jana & Singh 1995). There has been one quasi-experimental study comparing Sonagachi with neighbouring brothels. However, marked baseline differences, particularly higher client numbers in Sonagachi, limit the interpretation of the finding of no difference in STI prevalence (Gangopadhyay et al. 2005).

There has been one controlled study of a structural intervention combining elements from both the group empowerment model of Sonagachi and the political sanctions of Thailand. The study, conducted in 68 brothels in two cities in the Dominican Republic, compared the addition of regional policy change, which penalised the brothel management for failing to enforce 100% condom use, against an intervention that combined FSW solidarity, environmental cues for condom use, improved STI care, and self-regulation of the brothels. There were greater reductions in STI prevalence and a corresponding increase in likelihood of rejecting unsafe sex in the city where, the 100% condom use policy was in force. Condom use increased in individual FSWs and was associated with reduced incident STIs in both arms of the study. However, the likelihood of a brothel adhering to the 100% condom use program was 10% greater in the policy change area (Kerrigan et al. 2003; Kerrigan et al. 2006).

3.4 Discussion

Despite a considerable number of descriptive studies of sex-work in resource poor settings, I only identified 28 evaluated interventions with externally measurable outcomes. Less than half of these were RCTs, the robustness of which were compromised by very high attrition rates. There were four broad categories of intervention: behavioural interventions with condom promotion, behavioural intervention with the addition of a vaginal microbicide, behavioural interventions with the addition of STI treatment, and structural interventions. The small number of methodologically rigorous studies reflects the considerable challenges of studying this

group. The diversity in type of intervention, study design, and outcome measures, made, calculation of a summary measure of effectiveness inappropriate.

3.4.1 Which interventions worked?

Risk reduction counselling coupled with condom promotion reduced HIV or STI risk or increased condom use in all the five studies that tested this hypothesis (Bhave et al. 1995; Egger et al 2000; Feldblum et al 2005; Ford et al. 2003; Wong et al 2004). Additional support for the effectiveness of condom promotion comes from observed reduction in HIV incidence in both arms of STI treatment RCTs (Ghys et al. 2001; Kaul et al. 2002; Kaul et al. 2004) and the relationship between increases in self reported condom use and reductions in infections in two of the cohorts (Laga et al. 1994; Ngugi et al. 1988). Despite the methodological limitations of these studies, the consistency of the direction of change, the dose response, the association between participation in the intervention self-reported condom use and reduced infection rates, and biological plausibility; suggest that this is an effective strategy.

Two studies assessed female condom promotion and showed an increase in female condom uptake (Fontanet et al 1998; Hoke et al. 2007). There is only weak evidence from the before and after study of related reductions in STI incidence (Hoke et al. 2007). N-9 did not reduce HIV incidence and a meta-analysis of all N-9 studies found a relative risk for HIV of 1.12; CI 0.88 to 1.42 (Wilkinson et al. 2002). Trials of other microbicides are under way.

The two RCTs of presumptive periodic treatment and regular screening of STIs were unable to prove the hypothesis that STI treatment in FSWs will reduce HIV

acquisition (Ghys et al. 2001; Kaul et al. 2004b). The failure of two of the RCTs to also show an effect of presumptive treatment or regular screening on STI rates maybe explained by a type 2 error (loss of power from sizable reductions in STI rates in the control as well as intervention arms) (Ghys et al. 2001; Labbe et al 2006). The RCT that did show an effect of presumptive treatment on STI rates detected this sample size problem and lengthened the enrolment period accordingly (Kaul et al. 2002; Kaul et al. 2004).

One quasi-experimental study suggests that increasing the interval between rounds of presumptive periodic treatment may lessen its impact on STI prevalence (Gorter et al. 2005). Other studies also suggest that the effect of presumptive treatment is short lived (Behets et al. 2005; Cowan et al. 2005a). The effectiveness of the Nicaraguan voucher system in enabling nearly half of the FSWs countrywide to access STI health services (Gorter et al. 2005) and the preference for outreach services in truck-stops (Nyamuryekung'e et al. 1997) suggests devising innovative outreach services to improve the coverage of dispersed and clandestine FSWs.

The Thai 100% condom use programme was a countrywide multi-component intervention that sought to increase condom use, reduce the number of commercial sexual encounters, and improve provision for STI treatment. It is impossible to disentangle the relative importance of the different components of the intervention from each other, or secular trends. The observational data from the Sonagachi Project suggest that empowering SWs may reduce their HIV and STI risk. However, the reproducibility of this approach remains unproven (Basu et al. 2004). The Dominican Republic attempt to disentangle the relative effects of policy and empowerment

suggests that whilst pressure to create ‘model brothels’ through self-regulation resulted in a decrease in STIs, there was a greater effect in the city where the ‘model brothel’ was enforced through policy (Kerrigan et al. 2006).

3.4.2 Potential biases of the review process

Given the heterogeneity of the study designs a funnel plot for publication bias was not done; however there is likely to be publication bias. While some of the RCTs were unable to show an effect, almost all the quasi-experimental studies reported statistically significant findings in favour of the intervention being tested.

Interventions not published in peer reviewed journals are under-represented (Hopewell et al. 2007). Even within the grey literature there is potential for selection bias, as interventions funded or sanctioned by the larger donors are more likely to be accessed through UNAIDS, family health international or Population Council reports and best practice publications. As in all systematic reviews, despite extensive hand searching, there is still the possibility of indexing bias (Hopewell et al. 2002).

The review was restricted to evaluated interventions that had outcome measures of effectiveness that could be externally validated. This may have excluded less rigorously evaluated but nevertheless important and potentially effective interventions (Asamoah-Adu et al. 1994; Campbell & Mzaidume 2001; Chipfakacha 1993; Ganasinghe 2000; Nairne 1999; Wilson et al. 1990). However, self reported measures of, for example, condom use are unreliable and were therefore excluded from this review (Peterman et al. 2000; Zenilman 2005).

A limitation of this systematic review is that only interventions that involved women who exchange sex for gifts or money could be included. This means that potentially effective interventions with high-risk women such as bar workers, that were not explicit about the transactional nature of their sexual behaviour, were excluded (Riedner et al. 2006).

3.4.3 Potential biases of the studies and other methodological issues

Properly conducted RCTs are the best way of assessing the effectiveness of health care interventions. In this review fewer than half of the studies were RCTs and only just over half had any controls. The effect size of the quasi-experimental studies is greater than the RCTs, and several RCTs showed no effect.

Studies primarily targeted professional FSWs working in brothels or red-light districts. In reality much sex-work takes place in less organised settings, which would affect the broader applicability of the findings. Forty percent of the studies recruited participants from an STI clinic that had been specifically established for FSWs. Participants in a disease prevention intervention may not be representative of all FSWs; they may be more adherent, more visible and more likely to have received HIV prevention information. This may lead to participation bias. Analysis of the Kenyan cohort as an open cohort found a drop in incidence of HIV over time, which the investigators attribute to secular trends and the cohort attracting lower risk FSWs with the passage of time (Baeten et al. 2000). In addition, half of new HIV infections occurred within the first six months of joining the cohort, and 75% occurred within the first year (Baeten et al 2000), which may reflect the selection of higher risk

individuals early in the cohort's life (Beyrer et al. 1996). These are alternative explanations for the drop in HIV incidence, detected in two of the cohorts, after introducing the interventions (Laga et al 1994; Ngugi et al. 1988).

FSWs are highly mobile. Over half of the studies that followed FSWs reported attrition rates as high as 75%. This compromises the validity of the resultant outcome (Beyrer et al 1996; Beyrer & Nelson 1997). In one cohort, if all the women lost to follow-up were non-compliant, the 50% increase in condom use reported would be a more modest 10% (Ma et al 2002).

In order to minimise recall and social desirability bias, only studies with reproducible outcomes were included (Peterman et al. 2005). However, for a study to be powered to detect change subsequent to an intervention there needs to be a low baseline prevalence and high incidence of the outcome of choice. In at least three RCTs the lower than expected infection rates after enrolment may have resulted in a type 2 error contributing to the lack of effect found (Ghys et al. 2001; Kaul et al. 2004; Labbe et al. 2006).

HIV prevention in FSWs is a core group intervention. STIs are a communicable disease and any intervention to reduce STIs may have a herd effect. Thus any evaluation of STI and HIV prevention should also consider impact at a population level. None of these studies looked at HIV incidence in the bridge or general population, and only one out of the four studies that have measured the effect of the intervention on STIs in clients found an effect (Steen et al. 2000).

FSWs are a heterogeneous group. Factors such as relative number of the FSWs in relation to the bridge and general population, as well as the structure of the sexual networks and stage of the epidemic, influence the extent to which they behave as a “core” group (Cowan et al. 2005b; Lowndes et al. 2002; Nagot et al. 2005). Given the small number of effective studies I was unable to explore the relationship between phase of the epidemic and effectiveness of the intervention.

Given the complexity and multifaceted nature of these interventions, indicators of exposure to the intervention would have assisted interpretation (Power et al. 2004). Unfortunately the indicators to measure exposure commonly reported, e.g. number of clinic visits or educational events attended, are also measures of adherence. In the absence of controls finding an association between these measures of exposure and outcomes may be confounded by other factors associated with being an “adherent” participant in disease prevention. Data collection methods can behave as interventions, e.g. behavioural questionnaires could reinforce the behaviour message or social desirability bias. Equally, legally imposed “model brothels” may encourage management to implement additional, undocumented, interventions.

Few of the cluster controlled trials accounted for inter-cluster correlation in either the power calculation or in the analysis stage. This could result in a greater measure of effect than if clustering had been considered (Hayes et al. 2000). In three studies only two areas were compared, so we cannot exclude residual confounding or chance (Bhave et al. 1995; Kerrigan et al. 2006; Wong et al. 1998).

Finally it is increasingly apparent, as has been argued in the Lancet series on HIV prevention, that structural, behavioural and biomedical interventions are synergistic. Interventions that have been systematically reviewed here and elsewhere, with the exception of the structural interventions, are specifically designed to control for this synergy and make it difficult to comment on the effectiveness of combination HIV prevention for FSWs.

Table 3-1 Behavioural interventions and condom promotion in female sex workers

<i>Place Year</i>	<i>Study design⁵ Outcome</i>	<i>Population Sample</i>	<i>Duration Response rate/Follow-up (%)</i>	<i>Intervention⁶</i>	<i>Results^{7, 8, 9}</i>
Incident HIV					
India 1991-1993 (Bhave et al. 1995)	Cluster non random -CT Incident HIV Syphilis Hep BsAg	N = 2 areas in red-light district n= 541 FSW & 37 brothel owners	6 months ?/97%	(I) IEC, peer risk reduction counselling, condom promotion (C) No intervention	HIV incidence: (I) 0.05/100 py; (C) 0.16/100 py HIV incidence RR 0.32 (p 0.002)
Sexually Transmitted Infection					
Madagascar 2001 (Feldblum et al, 2005)	Single blind RCT Incident STIs	N= 1000 FSW Stratified by city	6 months ?/90	(I) Clinic-based + community based peer risk reduction counselling (C) Community based counselling only	Aggregate STIs OR 0.7 (0.5 - 0.9) Gonorrhoea OR 0.7 (0.3-1.0) Chlamydia OR 0.7 (0.5-1.0) Trichomonas OR 0.8 (0.6-1.2)
India 1991-1993 (Bhave et al, 1995)	Cluster non random – CT Incident HIV Syphilis Hep BsAg	N = 2 areas in red-light district n= 541 SW & 37 brothel owners	6 months ?/97%	(I) IEC, peer risk reduction counselling, condom promotion (C) No intervention	Syphilis RR 0.36 (p 0.002) Hep B sAg RR 0.27 (0.001)
Singapore 1994-2002 (Archibald et a, 1994; Wong et al, 2004; Wong et al, 1998)	Before and after study Gonorrhoea rates	Brothel based N= 2737 old SW and 1986 new SW	8 years 100/ 60	(I) Peer risk reduction counselling, condom promotion, IEC material, and deregistration of brothels with high STI rates (C) None [Both arms mandatory STI screen]	Gonorrhoea reduced from > 30-45 / 1000 person months to <5 / 1000 person months Gonorrhoea RR 0.11-0.17

⁵ Abbreviations used: RCT = Randomised Controlled Trial,

⁶ Abbreviation used: IEC = Information and education campaign, I = Intervention arm, C= control arm

⁷ Abbreviations used: OR = odds ratio, ^{adj}OR = Adjusted odds ratio, RR = Risk Ratio, ^{adj}RR = Adjusted Risk Ratio,

⁸ Where possible RR are calculated from data presented in the papers. Unless otherwise stated RR and OR are quoted for Intervention arm compared with control

⁹ Numbers in brackets following OR and RR are the 95% confidence intervals

Table 3.1 (continued)

Bali 1997-1998 (Ford et al, 2002; Ford et al, 2000)	Cluster non-random controlled trial STI incidence	N= 7 n= 1566 SWs	24 months ?/ 50% turn over per 6 months	(I) Three risk reduction sessions in six months (C) One risk reduction session in six month [Peer counselling and condom promotion in both arms]	Gonorrhoea OR 0.53 (0.33-0.83) Chlamydia OR 0.63 (0.40-0.99) Trichomonas OR 0.91 (0.46-1.81) STIs reduced in both arms and the differences between high and low effort areas declined over time.
Thailand, 1994-1995 (Fontanet et al, 1998)	Cluster RCT Incident STI	Brothel N= 71 brothels n = 548 SWs	24 weeks ?/ 26	(I) Addition of female condom (C) Male condom	Aggregate STI RR 0.76 (0.50-1.16) Female condoms were used 12% of the time
Madagascar 2001-2003 (Hatzell Hoke T et al, 2007)	Before and after study Incident STI	Research clinic N = 1000	18 months ?/82%	Addition of female condom to ongoing risk reduction counselling and male condom promotion	Aggregate STIs ^{adj} OR 0.7 (0.58 - 0.86) Female condoms accounting for 20% of the final condom use.
Condom disposal					
Nicaragua 1990 (Egger et al, 2000)	Cluster RCT with Factorial design Used condoms retrieved from rooms	N= 19 motels n = 6463 couples	24 days per motel 53/48 ¹⁰	A. (I.i) Condoms were placed in the room (I.ii) Condoms were handed to couple as they registered (C) Condoms available on demand at reception B. (I) IEC material in room (C) No IEC in room	In rooms: Condom retrieval OR 1.3 (1.09-1.75) To couples: Condom retrieval OR 1.3 (1.03 -1.6) Presence of IEC material: Condom retrieval OR 0.89 (0.84 - 0.94)

¹⁰ Percentage of all the motels approached who agreed to participate / percentage of condoms distributed that was retrieved

Table -3-2 : Vaginal microbicides in female sex workers

<i>Place Year</i>	<i>Study design Outcome</i>	<i>Population Sample</i>	<i>Duration Response rate/ follow up (%)</i>	<i>Intervention</i>	<i>Results</i>
Incident HIV					
Benin, Cote d'Ivoire, South Africa & Thailand 1996-2000 (Van Damme et al, 2002)	Triple Blind RCT Incident HIV Incident STI Genital lesions	STI clinics and truck stops N= 765 SW	48 weeks 76/68	(I) 52.5 mg: nonoxinol-9 vaginal gel (C) Identical placebo	HIV incidence ^{adj} RR 1.5 (1.0 - 2.2) HIV incidence (> 3.5 applications per day) ^{adj} RR 3.5 (2.1 - 5.8)
Cameroon 1994-1996 (Roddy et al, 1998)	Double blind RCT Incident HIV Incident STI Genital lesions	N= 1170 SWs	21 months 65/73	(I) 70mg nonoxinol-9 film (C) Identical placebo	HIV incidence RR 1.0 (0.7 - 1.5)
Kenya 1987-1990 (Kreiss et al, 1992)	Un-blinded RCT Incident HIV Lesions	Research clinic N= 138 SWs	14- 17 months 100/84	(I) 1000mg nonoxinol-9 vaginal sponge (C) Non identical placebo	HIV incidence ^{adj} RR 1.6 (0.8 - 2.8) Genital lesions RR 3.3 (p<0.001).
Kenya 1996-1998 (Richardson et al, 2001)	Double blind RCT Incident HIV Incident STIs	Research cohort N=278	19 months ?/69	(I) 52.5mg nonoxinol-9 gel (C) Placebo	HIV incidence RR 0.75 (0.37 - 1.53)
Sexually transmitted infections					
Benin, Cote d'Ivoire, South Africa & Thailand 1996-2000 (Van Damme et al, 2002)	Triple Blind RCT Incident HIV Incident STI Genital lesions	STI clinics and truck stops N= 765 SW	48 weeks 76/68	(I) 52.5 mg: nonoxinol-9 vaginal gel (C) Identical placebo	Gonorrhoea ^{adj} RR 1.2 (0.9-1.6) Chlamydia ^{adj} RR 1.2 (0.8-1.6)
Cameroon 1994-1996 (Roddy et al, 1998)	Double blind RCT Incident HIV Incident STI Genital lesions	N= 1170 SWs	21 months 65/73	(I) 70mg nonoxinol-9 film (C) Identical placebo	Gonorrhoea RR 1.1 (0.8-1.4) Chlamydia RR 0.9 (0.7-1.3)
Kenya 1987-1990 (Kreiss et al, 1992)	Un-blinded RCT Incident HIV Lesions	Research clinic N= 138 SWs	14- 17 months 100/84	(I) 1000mg nonoxinol-9 vaginal sponge (C) Non identical placebo	Gonorrhoea ^{adj} RR 0.4 (p<0.001)
Kenya 1996-1998 (Richardson et al, 2001)	Double blind RCT Incident HIV Incident STIs	Research cohort N=278	19 months ?/69	(I) 52.5mg nonoxinol-9 gel (C) Placebo	Gonorrhoea RR 1.8 (1.0-3.1) Chlamydia RR 1.4 (0.6-3.1) Trichomonas RR 0.8 (0.5-1.3)

Table 3-3: STI screening and treatment combined with condom promotion for female sex workers

<i>Place Year</i>	<i>Study design Outcome</i>	<i>Population Setting</i>	<i>Duration Response rate/ Follow-up (%)</i>	<i>Intervention</i>	<i>Results</i>
Incident HIV					
Cote d'Ivoire 1994-7 (Ghys et al, 2001)	RCT Incident HIV Incident STI	FSW clinic N= 542	42 months 45/ 42	(I) Monthly genital examination, microscopy & treatment (C) Examination and treatment only when symptomatic [Peer education & condom promotion both arms]	HIV incidence (I) 5.3/100 py (C) 8.5/100 py (p=0.5) RR 0.62 (0.5) HIV reductions in BOTH arms ^{adj} RR 0.42 (0.18 - 0.96). Women attending 80% of scheduled clinic visits less likely to seroconvert p=0.04
Kenya 1998-2002 (Kaul et al, 2004; Kaul, et al, 2002; Fonck et al, 2000)	Double blind placebo controlled RCT Incident HIV Incident STI	N= 466 SWs	969 person years 89/73	(I) Monthly presumptive treatment with 1g azithromycin (C) Placebo [Peer education & condom promotion both arms]	HIV incidence (I) 4/100 py (C) 3.2/100 py. RR 1.2 (0.6 -2.5)
Zaire 1988-1991 (Laga et al, 1994)	Longitudinal cohort Incident HIV Incident STI	Dedicated SW clinic N=531	36 months ??	Monthly STD screen & treat 3 monthly voluntary counselling and HIV testing & risk reduction counselling Peer education & condom promotion	HIV incidence rates dropped from before 11.7/100py after 4.4/100py RR 0.4 (p 0.003) HIV incidence in regular compared with irregular clinic attendees RR 6.2.
Kenya 1985-1986 (Ngugi et al, 1988; Ngugi et al, 1996)	Longitudinal cohort Non-random CT Incident HIV Incident STI	Cohort (1985) N= 595: (I.1) N=91 SW (I.2) N=67 SW (C) New recruits (1986) N=205	1-23 months ??	(I.1) Peer education, condom promotion, 6 monthly group risk reduction counselling, and individual counselling. (I.2) As above without individual counselling (C) Recent recruits before any intervention [Intervention groups also received periodic STI screening or treatment when symptomatic]	Reported condom use was associated with reduced incident HIV OR 0.34 (0.13 - 0.92) Condom use (I.1) 78%, (I.2) 64% (C) 52%

Table 3.3 (continued)

Sexually transmitted infections

Cote d'Ivoire 1994-7 (Ghys et al, 2001)	RCT Incident HIV Incident STI	SW clinic N= 542	42 months 45/ 42	(I) Monthly genital examination, microscopy & treatment (C) Examination and treatment only when symptomatic [Peer education & condom promotion both arms]	No significant difference between STI incidence
Kenya 1998-2002 (Kaul et al, 2004; Kaul, et al 2002; Fonck et al, 2000)	Double blind placebo controlled RCT Incident HIV Incident STI	N= 466 SWs	969 person years 89/73	(I) Monthly presumptive treatment with 1g azithromycin (C) Placebo [Peer education & condom promotion both arms]	Gonorrhoea RR 0.46 (0.31-0.68) Chlamydia RR 0.38 (0.26 to 0.57) Trichomonas RR 0.56 (0.40- 0.78) No significant reductions in the incidence of Syphilis
Benin and Ghana 2001-2002 (Labbe et al, 2003)	Double blind placebo controlled cluster RCT Incident STI	18 clusters N=384 SW, N=706 clients N=252 SW, N=1073 clients Individual randomisation N= 181 SW	9 months ?/80	(I) Presumptive periodic treatment azithromycin 1g first month and Ciprofloxacin 500mg given second and third month. Cycle repeated (C) placebo [Peer education & condom promotion both arms]	Gonorrhoea RR 0.78 (p 0.37) Chlamydia RR 1.9; (p=0.77) No significant difference in STI incidence in clients There was a drop in gonorrhoea in both groups after enrolment.
South Africa 1996-1997 (Steen et al, 2000)	Before and after study of SWs and miners Non-random control group distant from intervention Prevalence of STIs	FSW clinic N= 407 FSWs N= 608 N= 928 miners	9 months ?/32	(I) Monthly presumptive periodic treatment 1g azithromycin to SWs [Condom promotion & IEC]	Gonorrhoea & chlamydia (FSW) RR 0.24 (p<0.001) Genital ulcer disease (FSW) RR 0.17 (p<0.001) Gonorrhoea & chlamydia (miners) RR 0.6 (p<0.001) Genital ulcer disease (miners) RR 0.22 (p<0.001) Inverse relation between attending mine clinic with a genital ulcer and distance to intervention (p for trend 0.002).

Nicaragua 1995- 2004 (McKay et al, 2006; Borghi et al, 2005; Gorter et al, 2005)	Observational study of time trends repeat cross sectional studies Service utilisation STI prevalence	Community based N= 1500 SW	9 years 50% vouchers utilised/ na	(I) 50000 vouchers distributed for free STI treatment at designated clinics. The package consists of presumptive treatment with azithromycin 1g, screening for syphilis, trichomonas, candida, bacterial vaginosis and cervical cytology.	Aggregate STIs RR 0.5 Annual drop: gonorrhoea (8%), trichomonas (9%), syphilis (16%) Optimal gap for voucher distribution < 6 months.
Zaire 1988-1991 (Laga et al, 1994)	Longitudinal cohort Incident HIV Incident STI	FSW clinic N=531	36 months ?/?	Monthly STD screen & treat 3 monthly voluntary counselling and HIV testing & risk reduction counselling Peer education & condom promotion	Incidence of all STDs except chlamydia decreased over 3 years (p <0.01)
Kenya 1985-1986 (Ngugi et al, 1988; Ngugi et al, 1996)	Longitudinal cohort Non-random CT Incident HIV Incident STI	Cohort (1985) N= 595: (I.1) N=91 SW (I.2) N=67 SW (C)New recruits (1986) N=205	1-23 months ?/?	(I.1) Peer education, condom promotion, 6 monthly group risk reduction counselling, and individual counselling. (I.2) As above without individual counselling (C) Recent recruits before any intervention [Intervention groups also received periodic STI screening or treatment when symptomatic]	Annual gonorrhoea rate woman RR 0.23 (p<0.001) Decline in men attending STI clinic in intervention site compared to non-intervention site (p<0.001)
Peru 1994-1995 (Sanchez et al, 2003 ; Sanchez et al, 1998)	Longitudinal cohort Incident STI	N=917 SW	22 months 95/ ?	Risk reduction counselling, condom promotion and monthly STI screen and treat	Chlamydia ^{adj} OR 0.47 (0.28 -0.79.) Gonorrhoea ^{adj} OR 1.16 (0.61-2.3) Trichomonas ^{adj} OR 0.19 (0.09-0.37)
China 1998-1999 (Ma et al, 2002)	Longitudinal cohort Incident STI	N = 966	6 months ?/53	Risk reduction counselling 2 monthly STI screen and treat	Gonorrhoea RR 0.3 (0.11- 0.75) Trichomonas RR 0.14 (0.04- 0.45) Chlamydia RR 0.24 (0.14-0.4)
Cote d'Ivoire 1991-1997	Before & after	Community based	6 years	Peer education & IEC &	Gonorrhoea

(Ghys et al, 2002)	repeat cross-sections HIV Prevalence STI Prevalence	N=5218	90/na	condom promotion Voluntary counselling and HIV testing & STI care	RR 0.3 (p < 0.001) Syphilis RR 0.1 (p < 0.001)
Benin 1993-1999 (Alary et al, 2002)	Before & after repeat cross-sections HIV Prevalence STI Prevalence	N=374 N=365 N=591	6 years ?/na	Peer education & IEC & condom promotion Monthly STI screen & treat	Syphilis ^{adj} OR 0.24 (0.09 - 0.56) Gonorrhoea ^{adj} OR 0.47 (0.39 - 0.65)
Bolivia 1992-1995 (Levine et al, 1998)	Before & after Repeat cross-sections STI prevalence	Brothel based N = 508	3 years 80/ na	Periodic STI screen & treat Condom promotion Clinic based individual counselling Out reach workers	Gonorrhoea RR 0.6 (p<0.001) Syphilis RR 0.4 (0.02) Genital ulcer disease RR 0.8 (p<0.006)
South Africa 1998-2000 (Williams et al, 2003)	Before & after cross-sections STI prevalence	SW N= 121 & N= 93 Stratified random sample of men, women & miners N=899 & N= 769	2 years ?/na	Community level intervention: Peers educators from SW, mine workers & youth. Condom promotion Train health care workers in syndromic STI management Monthly presumptive treatment with azithromycin	Chlamydia (miners) ^{adj} OR 4.23 (p < 0.001), Gonorrhoea (miners) ^{adj} OR 2.61 (p < 0.001), Syphilis (RPR) (miners) ^{adj} OR 1.57 (p=0.02) Chlamydia (men) ^{adj} OR 3.54 (p<0.001) Chlamydia (women) ^{adj} OR 1.88 (p<0.001) Syphilis (women) ^{adj} OR 2.06 (p<0.001) Condom distribution increased three fold
Service uptake					
Tanzania 1993-1994 (Nyamuryekung'e et al, 1997)	Cluster RCT Service utilisation	N= 7 truck stops n= 330 high risk women	12 months ?/na	Different STI treatment delivery: (I.1) Primary Health Care worker led outreach clinic twice per week (I.2) Primary Health Clinic with STI drugs (I.3) Doctor led outreach clinic every three months (C) Primary Health clinic without STI drugs (standard of care)	Intervention (1) 1.43 visits/ woman Intervention (2) 1 visit/woman Intervention (3): 1.23 visits/woman Control: 0.4 visits/ woman

Table 3-4 Structural interventions for female sex workers

<i>Country Year:</i>	<i>Primary Intervention</i>	<i>Study population</i>	<i>Study design Outcome variables</i>	<i>Results</i>
Thailand 1989-1994 {Hananberg et al, 1994; Rojanapithayakorn et al, 1996)	100% condom program: Government led supply of condoms to SW establishments Sanctions for brothels fail to adhere to 100% condom Large scale media campaign targeting male clients to use condoms with SWs Increased number of STI clinics Free weekly STI tests for SW	Country wide	HIV surveillance data from blood donors, pregnant women, SWs, male STI clinic attendees, 21 year old army conscripts Statistics on the SW establishments from male STI clinic attendees and annual field surveys STI data from STI clinics and hospital out patient departments. Condoms procured by the government and distributed Condoms sold to retailers	Condom use in commercial sex establishment increased from 14 to 94% Government supplied condoms for 70% of SW and private sector for 50% (1992) Five major STDs decreased by 79% in men
Thailand 1989-1992 (Visrutaratna et al, 1995)	Pilot for 100% condom program Superstar peer-educators Condom promotion Model brothel Encourage peer pressure amongst brothel owners Supply free condoms Cost benefit for brothel owners	500 brothel based sex workers in Chiang Mai	Before and after X-section Participation in intervention Before and after behaviour data Refusal of simulated client w/o condom.	Participation up to 100% of identified female SWs No decline in clients or net income Before intervention 40% refused sex without condom After 90% refused simulated client after 2 months and around 80% after one year
Thailand 1991-1995 (Celentano et al, 1998; Nelson et al, 1996)	100% condom program STD treatment at baseline Incident STDs treated	2417 and 1669 military conscripts in the north of Thailand (random 19-23 year olds as selected by lottery) 90% contribute person time to the analysis.70% followed up 24 months	Comparing two Cohorts Six monthly surveys HIV incidence STD incidence Sexual behaviour	10 fold decrease in STD incidence between 1991 cohort and 1993 cohort from 17/100 py to 1.8/100 py (p<0.0001) HIV incidence from 2.48/100 py to 0.55/100 py RR 0.22 (p <0.0001) Brothel visits down from half to 1/3 Inconsistent condom use with SWs down from 14% to 2.5% (p <0.0001)
Thailand 1991-1994 (Kilmarx et al, 1998; Kilmarx et al, 1999)	100% condom use program:	Brothel based female sex workers over 16 and Thai nationals N= 500 16% loss to FU	Cohort study – before and after intervention HIV incidence STD incidence	^{adj} RR for incident HIV brothel based c.f. non-brothel based 7.3 CI 2.5 to 21.9 (p 0.05) Brothel based higher HIV incidence throughout

Table 3.4 (cont)

<i>Country Year:</i>	<i>Primary Intervention</i>	<i>Study population</i>	<i>Study design Outcome variables</i>	<i>Results</i>
India Calcutta 1991-2006 (Jana et al, 2004; Jana et al, 1998; Jana et al, 1995; Jana et al, 1994; Chakraborty et al, 1994; Das et al, 1994; Pal et al, 1994)	Sonagachi (red-light area wide) project: a) Empowerment: through self organisation of SWs b) Defining and tackling needs; legal advice, child immunisation, literacy and HIV prevention c) Collective bargaining with police, brokers, and brothel owners in HIV prevention d) Condom promotion e) Improved STI treatment	Women living in Sonagachi	Cross sectional surveys Surveillance data for STIs and HIV	Collective represents 60,000 SWs HIV prevalence in SWs has remained at <10% which is 3-10 fold less than SWs elsewhere in India e.g. Mumbai. Since 1992 drop in TPHA from 63.5% to 17% (p 0.001) and trichomonas 15% to 5% (p< 0.001)
India Calcutta 2003 (Gangopadhyay et al, 2005)	Sonagachi versus NACO (I) As above (C) Condom promotion & IEC & peer education	(I) Stratified random sample of 200 brothel based SW in Sonagachi N= 173 (87% response rate) (C) All SW from neighbouring area N=169 (65% response rate)	Non-random CT Outcome measures Behaviour and a combined clinical and laboratory diagnosis of STIs	Significant baseline differences between intervention and control arms Sonagachi women had significantly better health seeking behaviour and optimism scores No difference in bacterial STIs.

Table 3.4 (cont)

<i>Country Year:</i>	<i>Primary Intervention</i>	<i>Study population</i>	<i>Study design Outcome variables</i>	<i>Results</i>
Dominican Republic 1999- 2000 (Kerrigan et al, 2006)	(C) Brothel based intervention: 1. Solidarity through regular meetings between SWs & management. 2. Environmental cues for condoms 3. Improved clinical care through liaison & training for the government's mandatory monthly STI screens 4. Monitoring and reporting the performance of the brothels. (I) In addition to 1-4 above: Policy and regulation: Regional policy made condom use between clients and SWs mandatory & implementation the brothel owners and management's responsibility. This policy was enforced through a mixture of support and sanctions.	(C) Santa Dominga (34 brothels) (I) Puerto Plata (34 brothels) Participatory observations at all brothels Cross-sectional survey before and after intervention n=200 SWs per city (recruited from the mandatory government STI clinics-every 3 rd SW on a designated day) Response rate 95%	Before and after X-sectional studies Non random comparison: STI Condom use Rejection of unsafe sex Number of establishments without STIs per month Exposure to intervention	Decrease in STIs was only significant in intervention arm (I) ^{adj} OR 0.50; CI 0.32 to 0.78 (C) ^{adj} OR 0.60; CI 0.35 to 1.03 (I) Increased proportion of brothels with no new STIs OR 1.20; CI 1.0 to 1.31 (I) Increased rejection of unsafe sex ^{adj} OR 3.86; CI 1.96 to 7.58 Observed adherence to the intervention was significantly associated with reduced STIs ^{adj} OR 0.52; CI 0.35 to 0.78 Adherence increased at an individual level in both arms (p<0.001) Adherence at an establishment level only increased in intervention arm ^{adj} OR ¹¹ 1.2; CI 1.11 to 1.3

¹¹ Adjusted for interaction with time

3.5 Summary points

- None of the RCTs showed an impact on HIV incidence.
- Observational data suggests there is some evidence for the effectiveness of risk reduction counselling and condom promotion.
- There is evidence that condom promotion and regular access to improved STI management reduces STI burden in FSWs.
- There's no unequivocal evidence that intensive STI management in FSWs has any additional benefit in HIV prevention.
- Innovative STI delivery methods, such as vouchers, may improve coverage.
- Policy support for sex worker interventions and strategies that encourage community mobilisation may improve coverage, acceptability and adherence to the intervention.
- There is uncertainty around the efficacy of STI treatment in HIV prevention for FSWs, the most effective treatment strategy, and which components of structural interventions work,
- There is limited data available on the wider public health benefits of targeting FSWs and the potential negative ramifications of targeting FSWs (e.g. stigma, violence, and driving sex work underground or into areas less identified with “professional” sex work, such as bars and dance halls).

3.6 *The future*

There is a need to explore the effectiveness of interventions that impact directly upon the biological determinants of HIV transmission and acquisition, e.g. reducing the HIV viral load, newer microbicides, HSV-2 vaccine, and pre-exposure prophylaxis. Since this systematic review two RCTs of acyclovir prophylaxis for HSV-2 failed to show reductions in incident HIV in high risk women (Padian et al 2008). There is also a need to further understand the ways in which societal, community, and individual factors interact to make sex workers vulnerable and how structural interventions can modify this relationship to improve the risk environment. Evaluation of structural interventions that improve the coverage of dispersed sex workers and those who work outside of the brothel-based settings and red-lights districts are required.

4 Methodology

4.1 Introduction

In this chapter I will describe the study methods employed for the fieldwork in Goa, India. The study was conducted in three phases. The pre-demolition phase ran from November 2003 to June 2004 and was an ethnographic study documenting the effect of the police cordon in the run up to, and the process of the demolition of Baina red-light area. The early post-demolition phase (June 2004 - December 2004) consisted of rapid ethnographic mapping of the temporal, spatial and social reorganisation of sex-work, throughout Goa, in the immediate aftermath of the demolition. Finally the late post-demolition phase (December 2004 - December 2005) was a cross-sectional survey of a representative sample of sex workers throughout Goa, and an in-depth qualitative study of a purposively selected sub-set of the sample. Formative work on community mobilisation and developing the research tools continued throughout the first two phases. Pre-demolition, the study was based in Baina red-light area. Following the demolition, the study site was expanded to also include all urban settings, migrant slums, and the coastal tourist belt of Goa. Figure 4.1 provides a schematic representation of the study.

In this chapter I will first describe the study design in some detail for each of the three phases separately and subsequently describe the overall data collection management, analysis community engagement and ethics for all three phases.

Figure 4-1 A schematic representation of the study

Pre-demolition November 2003- June 2004	Immediate Post-demolition June 2004- December 2004	Late Post-demolition December 2004- December 2005
Community engagement and Advocacy		
Ethnographic study documenting the effect of the eviction order in the run up and during the demolition	Relief, food and shelter	In-depth qualitative study of sex workers in the aftermath of demolition
	Rapid ethnographic mapping of the spatial & social reorganization of sex work in Goa	
Develop the survey instruments & tools	Adapt survey instruments Identify “seeds” for respondent driven sampling	Cross sectional survey of STIs and HIV in a representative sample of 326 female sex workers

4.2 Study setting

The study was set in Goa, a small coastal state, which has been described in detail in chapter 2 section 5. Consequent to the thoroughfare of seasonal visitors, Goa has a large population of predominately migrant female sex workers (FSWs). The first phase of the pre-demolition study was conducted in the Baina area, adjacent to Baina beach in the port town of Vasco da Gamma. This area had functioned as a red-light area from the early 1960s and became a well-established red-light district after the liberation of Goa from the Portuguese in 1968. By 2003 this small, well-demarcated area of 0.09km² had become home to 6 to 7 thousand people. This consisted of brothel owners, a fluctuating number of sex workers and their families, pimps, bar owners and other people working on the periphery of sex work or in the nearby industries. Baina red-light area is described in more detail in chapter 2 section 5.

The second and third phase expanded to include the main urban settings, migrant slums, and the northern and southern coastal tourist belt of Goa. The rapid ethnographic mapping of sex work conducted throughout Goa after the demolition of the Baina red-light in June 2004, showed that homogeneous brothel-based sex-work evolved into a heterogeneous dispersed and clandestine trade (Shahmanesh & Wayal 2004). This consisted of street-based FSWs soliciting in railway stations, bus-stops and municipal parks; FSWs working 10-14 day contracts in lodges throughout Goa; women working from home and through mobile phones; FSWs on short term contracts to pimps and confined to flats; construction workers and slum women subsidising their meagre income with transactional sex; and the survivors of the Baina demolition continuing to operate from the neighbouring slums.

4.3 Phase 1: The pre-demolition phase

4.3.1 Summary

The pre-eviction phase ran from November 2003 to the demolition on June the 14th 2004 and was based in Baina red-light area. The aim of this phase was to describe the impact of the eviction order on Baina-based sex workers using ethnographic and qualitative methods. The community engagement process was initiated during this phase and formative work was done to develop and pilot the survey instruments. This phase can itself be divided into two stages. In the first stage the objective was to assess the feasibility of conducting the study in the aftermath of the high court order and refine the research question accordingly. In the second stage the objective was to document the effects of the eviction order on the working conditions and health of sex workers.

4.3.2 Study design

This phase was primarily an ethnographic study. Data was collected using a mixture of participatory observation, serial interviews and group discussions with key informants.

4.3.3 Study population

Key informants were chosen from a range of people who lived or worked in the Baina area and included both brothel-based and independent female sex workers, brothel owners (*gharwalis*), health professionals, bar-owners, pimps and motorcycle taxis, trinket sellers and clothes washers, peer-educators and non-governmental organization outreach workers, clients and local politicians.

4.3.4 Qualitative data collection

A team of six researchers and I were based in the area for the six months preceding the demolition during which we undertook over two thousand hours of participatory observation. The researchers engaged more than one hundred purposively selected informants in informal interviews and group discussions. Key informants were re-interviewed on a daily, weekly, or opportunistic basis.

From November 2003 until January 2004 the focus of the interviews was on the feasibility of conducting a study among sex workers at this time and refining the research questions. This was achieved through enquiring about the likelihood of the eviction occurring and its potential impact; determining what the likely response to the eviction might be both from Baina residents and from 'ancillary workers' who did

not actually reside in the area; and mapping the HIV and sexual health services available to Baina sex workers.

From January - June 2004 the study focused more on the direct effects of the eviction order and the police cordon that had been placed around Baina; in particular its effect on sexual risk and health. The questions evolved in an iterative way to inform and develop a narrative of the run up to the demolition from a range of perspectives. Moreover, the serial nature of the interviews enabled the informant to develop a theme or topic over the course of days or weeks. Informants were probed about the events of the day and their impact upon their lives; their actions and mechanisms of coping with the events; their concerns, fears and plans for the future; the impact of the police cordon on organization of sex-work, sex workers sexual risk, relationships within Baina, violence, police raids, health, access to health, and health priorities.

4.4 Phase 2: Early post-eviction

4.4.1 Summary

Following the eviction in June 2004 the reorganisation of sex-work was mapped, throughout Goa, using rapid ethnographic techniques. The aim of this phase was to understand the spatial, social and temporal reorganisation of sex-work in the aftermath of the eviction. The specific objectives of this stage were to describe the geography and typography of sex-work after the demolition; to understand how sex-work had changed since the demolition; to identify the sex-work access points for clients; and to describe the availability and perception of HIV prevention and treatment of sexually transmitted infections (STI). During this phase the survey tools

were also adapted to the new circumstances. This was the dominant research process until December 2004 after which it continued, less intensively in parallel to the-cross sectional study.

4.4.2 Study design

In this phase we utilised rapid ethnographic mapping methods. This included physical mapping, participant observation and key informant interviews (Wilson 2001).

4.4.3 Study population

Key informants were defined as people who worked in the sex trade, or in close proximity to sex-work, or were knowledgeable about their locality. They included health-professionals, bar and lodge-owners, other sex workers, *gharwalis* (female brothel-owners), pimps, motorcycle-taxis, rickshaw and taxi drivers, security-guards, NGO workers and peer educators, shop-keepers, *paan wallahs* (betel nut sellers), street vendors, security guards, and local leaders.

4.4.4 Qualitative data collection

Eleven researchers mapped the urban centres, migrant slums and coastal belt of Goa. They drove and walked through each area marking parks, beaches, places of worship, pharmacies and health facilities (clinics and hospitals); traditional healers; *paan-wallahs*; trinket-sellers; hotels and lodgings; bars; wine-shops and alcohol outlets; restaurants; truck halt points; factories; construction sites; motorcycle taxi and rickshaw stands; bus-stands; official buildings; and educational institutes. Site

inventories were completed for each area detailing the population size (stable and transient), social class, major sources of employment, the presence or absence of vulnerable populations such as migrants, truckers, fishermen, tourism-related workers, types of housing, and presence of non-governmental organisations and other social welfare groups working in the area. Over three thousand hours of participant observation and several hundred informal key informant interviews were conducted to identify health problems, leisure activities for young men, the type and number of sex workers, where, when and how they worked, how they found customers, who were the clients, and how this picture changed after the demolition of Baina. This mapping data was recorded in field notes and discussed in team meetings on a weekly basis and was incorporated into the next phase in an iterative way, i.e. the data were verified, refined or refuted by information from key informant interviews (Wilson 2001; Wight et al 2006). During the mapping interviews a sub-group (n=34) were identified for more detailed, open-ended semi-structured key informant interviews (KII). The selection of key informants was based on knowledge about sex-work in their locality, the rapport with the interviewer, and purposive selection of different types of informants from a wide range of locations. Three focus group discussions (FGD) were conducted with occupational groups identified as clients and mediators: fishermen, truckers and motorcycle taxi-drivers.

4.5 Phase 3: Late post-demolition

4.5.1 Summary:

From December 2004 to December 2005 a representative cross-sectional descriptive study of female sex workers, recruited throughout Goa, was conducted. In-depth

interviews (IDI) were conducted with a purposively selected subgroup of female sex workers. The aim of this phase was to develop an evidence-based HIV prevention intervention for female sex workers following the demolition. Specific objectives of this phase of the study were to describe the psychosocial and demographic characteristics, mobility, typology and sexual networks with paying and non-paying partners of sex workers in Goa; to describe the reproductive health, knowledge about HIV and STIs and health seeking behaviour of female sex workers; to describe the epidemiology of bacterial and viral STIs and HIV in female sex workers; and to describe the effect of the emerging organization of sex-work on sexual risk.

4.5.2 Study design

A cross-sectional study of female sex workers recruited through respondent driven sampling.

4.5.3 Study population

Female sex workers, defined as women who had exchanged sex for money or other commodities in the past three months. This also included “indirect sex workers”, a category of sex workers that may not self identify as sex workers, but who periodically exchange sex for gifts or money.

4.5.3.1 Sampling strategy

Recruiting a representative sample of marginalized groups who engage in socially unsanctioned behaviours is extremely difficult. Population-based sampling is

unsuitable for detecting hard-to-reach groups as they are mobile, migrant and may not be recorded in the usual census, primary health care and electoral lists. If sex-work occurs within a geographically defined red-light area, then enumeration to define the sampling frame is a straightforward strategy to select a random sample. However following the demolition of Baina red-light area this strategy was no longer appropriate. Social marginalization along with associated stigma influences care and support-seeking behaviours, resulting in low utilization of established institutions, and limiting the use of facility-based sampling. For example HIV prevention services or sexual health clinics may attract sex workers who perceive themselves to be at risk of having contracted HIV or other sexually transmitted infections. Moreover, the demolition had resulted in the closure of the majority of services available for sex workers and so facility-based sampling was no longer an option available to us. The mapping indicated that sex-work had become extremely hidden and clandestine and there were few geographically defined areas where sex workers could be reliably found. The police presence and ‘hounding out’ of street-based sex workers led to constant changing of solicitation points, consequently, time-location sampling became logistically impossible (Indian Council of Medical Research & Family Health International 2007; Magnani et al. 2005; Mills et al. 1998).

That left chain-sampling or snowballing as the only feasible strategy to reach the hidden sex workers. For these sampling methods, several members of the target group are identified. These initial members of the chains are classically referred to as ‘seeds’. The ‘seeds’ are then asked to identify other members of the target group and from these referrals further members of the target group are identified. In this way through the chain and network, members of a hard-to-reach or clandestine group such

as sex workers can be identified and recruited for a study or research (Magnani et al. 2005).

However use of these methods has been limited by biases that are introduced through this sampling methodology. Despite reassurances seeds may remain suspicious of the researchers' motivation and fail to name their friends in the network, otherwise known as 'masking'. As the seeds are often identified through a service provider they may not be representative of the population at large. Given the seeds are not randomly selected the biases inherent in the seeds will be reflected in the whole sample. Larger networks and those with a larger number of contacts will be over-represented in the final sample. Finally, seeds may employ 'assortative' sampling, wherein the seed chooses recruits from his or her network who he or she thinks, either the researcher will find more interesting, or, will benefit more from participation in the study. This is particularly problematic if the seeds are selecting participant more or less likely to have the outcome of interest, e.g. someone known to have HIV or STI (Magnani et al. 2005).

In order to overcome these inherent problems in classical chain-sampling a particular variant of chain-sampling methodologies called respondent driven sampling has been developed. The principle behind this sampling method is that many of the biases inherent in chain-sampling can be overcome by using additional techniques.

The first feature of respondent driven sampling is that it delves deeper into the hidden networks by increasing the number of waves of recruitment to between six and eight waves or until equilibrium in the characteristics of the sample are reached. This

number is based on the mathematical proof of small world theories i.e. that all people are separated from one another by six degrees of separation. It can be shown mathematically that the further away you get from the seeds the further you get from the bias of the seeds not being randomly selected. This lengthening of the chain is achieved through rationing the number of recruits per respondent. The second feature is to encourage seeds to recruit the next wave of the sample by using primary and secondary incentives. Seeds are given an incentive for participating in the interview and they are also given an incentive for others that they recruit. This reduces over-representation of people who frequently volunteer for research and under-sampling of the seeds' friends. Although this sampling strategy does not overcome assortative selection, by reducing the number of recruits per seed and increasing the total number of seeds, biases introduced by an individual seeds' assortative selection can be diluted. The third important feature is that by documenting each recruiter's network size and relationship with the recruited, a probability of being recruited can be calculated and the data weighted accordingly (Abdul-Quader et al. 2006; Broadhead et al. 1998; Magnani et al. 2005; Ramirez-Valles et al. 2005).

This method of sampling has been used extensively with injection drug users in the USA. It seems to perform relatively well in head to head comparisons with other sampling strategies (Kendall et al. 2008; Platt et al. 2006). More recently it has been utilised for other populations such as female sex workers and men who have sex with men, and in resource poor settings, where there have been more mixed results (Johnston et al. 2006; Johnston et al. 2008b; Johnston et al. 2008a; Malekinejad et al. 2008; Platt et al. 2006; Simic et al. 2006). One particular unforeseen problem was that some marginalised populations, such as female sex workers, have weak social

networks (Simic et al. 2006), which may account for the slower recruitment observed with sex workers compared to injection drug users (Malekinejad et al. 2008).

The proponents of this method argue that this is as close to probability sampling as can be achieved without a sampling frame. It has the advantage of being inherently flexible and responsive when dealing with a hard-to-reach population like sex workers, for example other members of the network such as pimps and brothel owners could also be utilized in the recruitment process. It can be particularly effective at reaching the less visible members of sex worker populations (Johnston et al. 2006). It also allows size estimations and gives insight into the sex worker networks. This can form the basis of a peer driven intervention and estimates of coverage (Broadhead et al. 1998; Broadhead et al. 2002). However, in order for optimal performance, there needs to be clearly defined and tested tools to elicit the social network that the seed is recruiting from, as this forms the basis of the weighting. The design effect needs to be taken into consideration in sample size calculations (Salganik 2006). Moreover, detailed ethnographic mapping undertaken prior to sampling can help with understanding the social networks and identify seeds appropriately.

The female sex workers in the survey were recruited using respondent driven sampling. The initial recruiters, also known as 'seeds', were defined as female sex workers or community members proximate to the sex workers. The purposive selection of community-based seeds as opposed to facility-based recruitment, to ensure that all the settings and typologies of sex work identified during the mapping were represented, was an important modification we introduced to counter the effect of weak social chains observed in other studies of female sex workers. Seeds were

therefore selected from various ethnicities, ages, areas of Goa, and sex-work typologies that were identified during the qualitative phase of the study. They were given vouchers with unique numbers to recruit three other members of their network into the study. Each respondent was given a sum of 100Rs (\$2.50) for participating and a further sum of 50Rs (\$1.25) for each successfully recruited referral. The financial compensation needed to be enough to encourage recruitment of other members of the network without becoming a coercive force (Scott 2008). Given the huge variability of income across sex-work types the final sum chosen was a complicated compromise, and for some of the contract sex workers the main incentive became the laboratory testing whilst for the indirect sex workers, these sums of money were an incentive. In keeping with other studies utilising respondent driven sampling, we aimed for six waves of recruitment (Magnani et al 2005).

4.5.3.2 Post-eviction qualitative study

Female sex workers were purposively selected to include the range of sex work identified during mapping as well as different ages, ethnicities, areas of work, and HIV status.

4.5.4 Quantitative data collection

This will be described in more detail in the section on data collection (4.6). In summary trained female interviewers administered a questionnaire that was translated and extensively piloted in four Indian languages (Hindi, Konkani, Kannada, and Telegu). Female sex workers were interviewed in a variety of settings, including hired rooms, lodgings, drop-in-centres, the project vehicle, and clinics. The

questionnaire, which took 60 minutes to complete, was a composite of questions derived from several validated questionnaires on demographics, psychosocial factors, sex-work and sexual risk, knowledge and exposure to HIV prevention interventions, reproductive health and health seeking behaviour (Cowan et al. 2005; Furukawa et al. 2003; Kessler et al. 2002; Kessler et al. 2003; Morison et al. 2001; National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001; Patel et al. 2006). An informal confidential voting interview collected responses to sensitive questions from each respondent (Gregson et al. 2002; Gregson et al. 2004).

Women were asked to provide self-taken vaginal swabs and dried blood spots. These specimens were tested using the Roche Amplicor PCR assay for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* infection, culture (In-pouch) for *Trichomonas vaginalis*, WHO testing algorithm for HIV, and Enzyme Linked Immune Absorbent Assays for antibodies to *Herpes simplex virus type-2* (see section 4.8 for further details of the laboratory methods).

4.5.5 Qualitative data collection

One researcher conducted in-depth interviews (IDI) with sixteen female sex workers. The interviews took place in a variety of private settings, including a community centre, non-governmental organisation offices, and rented rooms. Three core topic areas were explored during the interview: their experience of sex work, the impact of the eviction on their working practices and sexual risk (including non-Baina sex workers), and their perception and understanding of HIV and STIs. The first part of the interview consisted of a detailed life history, punctuated with major life events

(marriages, childbirth, deaths, illnesses, and separations), and the narrative of entering the sex trade. The second part concentrated on their current working and living conditions and any changes since the demolition (using major festivals to mark the time of the demolition for women who had not worked in Baina). The third part contained specific probes relating to security and violence, sexual and mental health, HIV and its prevention, and health beliefs.

4.6 Data collection and management

4.6.1 The research team

As with many marginalised groups, female sex workers were a complex group with many different interest groups vying for a better position in the pecking order. This tension was exacerbated by the uncertainty and violence of the demolition and manifested itself in the shape of divisions and animosities, e.g. ethnic tensions, animosities between different sex worker types, fear of unfair competition from the ex-Baina sex workers, and distrust of all agencies governmental or non-governmental. In this context establishing trust, communication across barriers of class, caste and ethnicity, and avoiding over-identification with any one sub-group became an important methodological challenge. One mechanism of tackling this was the organisation, make-up and training of the research team.

The study was implemented through an organisation called *Positive People*. This was the first non-governmental organisation that had provided targeted HIV prevention interventions for sex workers in Goa, and consequently, had a close relationship with the community. However, in order to minimize conflict of interest arising between

research and service provision, the research was conducted by a team employed specifically for that purpose. They had separate offices and a separate administrative and management structure to the service providers within *Positive People*.

Ensuring a diversity of age, gender, ethnicity, language, and class or caste, were important factors in ensuring the research team could engage with the multitude of ethnicities that practised sex work and/or were gatekeepers. However, we were also constrained by the heightened stigma surrounding working with sex workers during the Baina demolition period. This manifested itself in difficulty in recruiting skilled staff and family opposition to the researchers working with sex workers, resulting in substantial attrition of staff during the initial training program. Eventually, a team of thirteen male and female researchers, aged between twenty and fifty, from diverse educational, social, religious and ethnic backgrounds, were recruited. Collectively the team could speak eight Indian languages and included members of all the key migrant groups from Karnataka, Andhra Pradesh, Kerala, and Maharashtra, as well as Goa. Two members of the team had prior experience of working in Baina and had strong rapport with the community. One was a qualified nurse who had worked in HIV prevention and the other was a popular photographer, who had worked in Baina a decade earlier. In November 2003 we started with two researchers, including myself. In March a further four researchers, including the project coordinator, joined the team. In September 2004 two of the six researchers left for personal reasons and seven new researchers were recruited. This team of eleven continued until the end of the research period. Their training program consisted of ethics, communication, community engagement, in addition to HIV /STI technical knowledge, research methods, qualitative research and practical training on the survey tool and sampling

techniques. Field based training and supervision and weekly updates were provided throughout the program.

The events leading to the demolition and after created a challenging and demanding research context. The anger and impotence that the research team felt as they watched the bulldozers demolishing Baina and the animosity that they faced from the embittered Baina community, created complex emotions and difficulties in maintaining “distance” and potentially, “scientific objectivity”. The weekly meetings created the space to reflect on the unfolding events, the relationship between the team and the community, and to deconstruct the complex emotions, physical, moral, and communication challenges. We documented this evolving relationship with the community in the field notes and meeting summaries. This was considered as an explicit outcome of the qualitative study and fed into the mapping and community engagement in an iterative way.

4.6.2 Development of instruments

The consent form and participant information sheet, the questionnaire and the specimen collection and standard operating procedures were all piloted in four stages.

1. They were extensively pre-tested with the research staff and the NGO staff.
2. They were pre-tested for comprehension and acceptability with five peer-educators
3. The final product was piloted with fifteen participants in the study. The tools and standard operating procedures were revised after each pilot interview.
4. The tools was further refined and re-piloted in each language in the aftermath of the demolition.

The tools was translated into and piloted in five languages, English, Hindi, Telegu (Language of Andhra Pradesh), Kannada (Language of Karnataka) and Konkani (Language of Goa).

As a result of the pilot we found that the K10 (Furukawa et al. 2003; Kessler et al. 2002; Kessler et al. 2003) performed better in terms of content validity of mental health assessment than the General Health Questionnaire (GHQ). The sensitivity around discussing their intimate non-paying partner was resolved by using a standardized description defining intimate non-paying partner as well as listing the various terms used for intimate male partners that we had identified during formative work. For example for the Andhra women the Telgu word for boyfriend was found to be derogatory and so we used the term *Baina mugulu*, which means Baina husband as opposed to legal husband in the village. The term *mard*, literally translated as man, was acceptable amongst the women from Karnataka. The typography of sex-work used in the questionnaire was informed by the mapping data. The question on mobility was refined to reflect both the first time she migrated to Goa as well as the possibility that she may have returned to her home village in the interim. The question on violence was adapted to also include violence from local gangs (*goondas*) and other sex workers. More sensitive questions were either discarded or skips introduced to avoid repetition. Time-lines were adapted and landmark events were identified to assist recall. Questions to collect information about police raids were added, as they were becoming a frequent issue raised in the mapping exercise. Alcohol was often consumed only when the sex worker was with a customer and so questions were modified to reflect this. Some women thought that all blood tests

were HIV tests and so the question on HIV testing had to be modified accordingly. Even standardized HIV knowledge questions underwent small modification to improve content validity. Many women used two or more condoms and so this had to be added to the condom use question.

During the formative work it became clear, as in other settings, that the questions about condom use with clients and intimate non-paying partners were particularly prone to social desirability bias. Abortion, sexual violence and child sexual abuse were sensitive questions that women would find difficult to answer in a face-to-face interview. We therefore decided to ask these questions using an informal confidential voting booth (Gregson et al. 2002; Gregson et al. 2004). We did, however, want to be able to link a particular response to an individual participant. We therefore devised a voting booth to enable the participants to deposit their answers confidentially. The key challenge was that the majority could neither read nor write in any language. During the pilot various versions of the voting booth were tested. The final model was a voting booth that had two slots, one coloured green for yes, and one coloured red for no. Both were shielded from the interviewers view. As the question was read out by the interviewer the women was given a numbered coin which she could deposit into the green slot if the answer was yes, the red slot if the answer was no, and not deposit at all if she didn't want to answer.

4.6.3 Data collection:

Survey: A trained female interviewer administered the questionnaire in the language of the interviewee's choice. The questionnaire, which took 60 minutes to complete, was a composite of questions derived from several sources on demographics,

psychosocial factors, sex work and sexual risk, knowledge and exposure to HIV prevention interventions, reproductive health and health seeking behaviour (Cowan et al. 2005; Furukawa et al. 2003; Kessler et al. 2002; Kessler et al. 2003; Morison et al. 2001; National AIDS Control Organisation, Ministry of health and Family Welfare, & Government of India 2001; Patel et al. 2005; Patel et al. 2006)

Responses to sensitive questions were given anonymously and deposited into a colour-coded locked voting booth (Gregson et al. 2002; Gregson et al. 2004). The variables are summarised in table 4.1. The actual questionnaire can be found in the appendix.

Table 4-1 Summary of exposure variables collected during the survey

Socio-demographic	Age; ethnicity; religion; marital status; literacy; schooling; debt; home-ownership; the responsibility to support dependents; number of children; migration status; and recent mobility
Sex work and sexual risk taking	Duration in sex work; age of starting sex work; type of sex work (brothel, street, or home-based); part time sex work (defined as a women whose sole source of income was not sex work); number of customers in the past week and average number per day; income per customer; consistent condom use with clients and regular male partner (always sometimes and never); condom use with last customer (secret ballot); non-condom use in exchange for more money and non-condom use due to coercion (both secret ballot); female condom use; number of regular customers; number of intimate non-paying male partners and change in intimate non-paying partner over the past three months and a year; number of places/establishments engaged in sex work; type of sex; number of condoms used per sexual act; use of oil based lubrication; vaginal douching; sex during menstruation; experience of police raids over the past year.
Gender disadvantage	This was assessed in two ways: First, the participant's experience of violence was elicited through questions about life-time experience of verbal and physical violence from intimate non-paying sexual partners and others in the community; experience of sexual violence was collected using the confidential voting interview. Second, the participants' autonomy to make decisions measured as: entrapment i.e. unable to leave sex work by choice; financial autonomy i.e. having money to utilise as they choose; political autonomy i.e. having exercised the right to vote during elections; and the autonomy to make decisions regarding their own sexual safety with clients.
Social support	The extent of participant's social support, measured as whether they had someone to turn to for support in the past week, and who they turn to for support.
HIV prevention	Knowledge regarding HIV transmission and prevention was measured using questions adapted from the national behavioural survey to assess changes in behaviour and prevalence of HIV/STIs in populations at risk; recent and lifelong exposure to HIV prevention interventions was ascertained; source of information about HIV; change in behaviour as a result of HIV; ever having an HIV test; and the source of condoms.
Reproductive health and health seeking behaviour	Current and recent reproductive tract symptoms were ascertained; contraceptive use; infertility, defined as failed attempt to have a child over the past year; ever having had an abortion was elicited using the confidential voting interview; awareness about STIs; causes of vaginal discharge; number of pregnancies; and STI health seeking behaviour.
Mental health & self harming behaviours	K10, a ten-item questionnaire that has been widely validated in the Indian settings including Goa. The K10 elicits the frequency of various depressive and anxiety symptoms over the past month on a four point Likert scale of frequency and generates a continuous score (range from 0-40) measuring the severity of symptoms of common mental disorders Suicidal behaviours were measured using separate questions to elicit whether they had contemplated, planned, or attempted suicide in the last three months. They were also asked about whether or not they had deliberately self harmed and why.
Substance abuse	Use of alcohol, Gutka (chewed tobacco) and smoking was rated on a six point Likert scale, which was re-categorised to at least once a week, less than once a week and never.

Qualitative study: I have described this in some detail in the previous sections. In summary, several hundred informants were interviewed during approximately five thousand hours of participatory observations. Field researchers kept a daily record of

their observations, serial informant and brief mapping interviews in their field notes, which were transcribed on a monthly basis. Maps were drawn of the area and then supplemented using an inventory to collect additional data in a systematic manner. The mapping data were discussed intensively at the weekly meetings and informed further data collection in an iterative way common to rapid assessment procedures (Wilson 2001; Desmond et al. 2005). In-depth interviews (n=16) and key informant interviews (n=34), and focus group discussion (n=3) were conducted using the following topic guide and lifelines.

Topic guide I for key informant interviews

General probing:

How long have you lived here? What do you do? What do you think about this place?

General information about the area:

What kind of people lives here? Probe about migrants: Where do they come from?

How long have they been here? Are they seasonal? What do they do? What age do they come? Where do young men go for leisure? Or what do they do for leisure?

Sex-work:

Are there any sex workers? How many? Where do they work? What are their timings? How do they operate? How do they get customers? Who is involved in organising the sex trade e.g. pimps, brothel owners, lodge-owners, motorcycle taxis? The mobility of sex workers (where are they from and where do they go to)

Probe around raids or arrests of sex workers in the area?

Probe around clients and customers

Access to health services

Condoms, risk reduction counselling and STI care

(Health workers: What are the main health problems that you see? Probe about their experience with TB, HIV, STI: how much of each do they see? What do they do if they suspect if a patient has HIV or an STI? How is the problem changing over time?)

Change since demolition

How has sex work changed since June 2004? Have they spotted any Baina girls? If so how many and where?

What is their opinion about the demolition?

Further contacts that may know about sex work

Topic guide II for focus group discussions and clients of sex workers

General probing: Where they come from? Time spent in Goa? Family context?

Relationship with sex workers

How do they find sex workers?

Where do they meet sex workers?

When do they meet sex workers?

Conditions in which they access sex workers e.g. after drinking alcohol, in-groups

Who are the sex workers?
Condom use with sex workers
Attitude towards sex workers
Experience of raids/ arrests and bribes
How has it changed since Baina demolition?
Opinion of Baina demolition

HIV and STIs

Knowledge and beliefs
Health seeking behaviour
Experience of infection
Fears and concerns

Topic guide III: In-depth interviews with sex workers

Life-story narratives:

Explore their life story
Marriages / non-paying intimate partnerships
Children and dependents families

Sex-work

Initiation
Mode of operation (as in topic guide 1)
Economic dependence on sex work

Impact of the eviction

Change in work patterns/ modalities of work
Mobility
Impact on relationships and social networks
Socioeconomic issues
Impact on security and violence
Impact on self-esteem
Health impact (mental health, substance abuse, deliberate self harm, attitude of health care providers)
Impact on HIV risk (accessibility of services and condoms, negotiating ability, condom use)
Future plans short and long term

4.6.4 Data management, quality control and quality assurance

Data management was the responsibility of the data management team, which consisted of the administrator and the administrative assistant. All questionnaires were clearly marked with the interviewer unique identification number, date, time and place of interview.

The project coordinator was responsible for quality control and quality assurance. Two separate reviewers, the project coordinator and I reviewed each completed questionnaire. We each signed and dated the questionnaire, clearly marked our queries in a colour pen and returned them to the respective interviewers. Check questions were present for internal consistency. Inconsistencies and queries were referred back to the field. Once all queries were resolved the questionnaire was passed onto the data management team. The administrative assistant would log in each questionnaire and file it in the participant's binder, which was subsequently locked in a secure filing cabinet in the main office. All forms with personal information such as names and addresses (e.g., informed consent forms and locator information) were kept separately from data collection forms in the main office. The completed questionnaires and laboratory results were marked with the participant's unique identification number. In order to be able to give the results of the curable sexually transmitted infection tests back, the unique identifier and name were linked in the link-log that was kept securely in a locked drawer, only accessible to the data management team, and destroyed at the end of the recruitment period.

All steps in the data collection and management were laid out in standard operating procedures and protocols. A list of these SOPs is presented in the appendix. All study staff were trained on these protocols. It was the duty of the project coordinator to ensure that the protocols were adhered to. Any deviation from protocol would lead to a retraining session with the individual concerned and the whole team during the weekly team meetings.

The research staff were extensively trained on questionnaire delivery using small group work and role-play. They were then intensively supervised in the field. They first observed interviews in the field, and then conducted them under direct observation, before they were able to conduct them independently. The project coordinator and I made random checks in the field to ensure that the standard operating procedures were being followed and the questionnaire was being administered as planned. These sporadic checks in the field as well as the quality control of the questionnaires were used as the basis for continuous re-training. Feedback from the peer educators and community advisory board members were rigorously pursued.

Recommendations for document/form improvements and alterations were made to the project coordinator or me. All suggestions included a date, description of the change requested and the rationale for making the change. The project coordinator and I signed off each new version of the protocol and standard operating procedures. Research and administrative staff provided their signatures on a log to indicate that they had read and understood the revisions made to the protocol or study tools.

Quantitative data was entered from pre-coded questionnaires, checked for obvious errors, and double entered onto a computer database by trained data-entry clerks. Appropriate range and consistency checks were carried out prior to analysis.

Sixteen in-depth interviews with female sex workers and 34 key informant interviews were tape-recorded, transcribed, translated and then checked by the interviewer against notes taken during the interview. Three focus group discussions were

transcribed from the tape recording with the aid of an observer's notes. Approximately 5,000 hours of participatory observation was transcribed from the field notes. Quality control and feedback was provided through regular review of the tape recordings. The qualitative data was entered into NVivo 2 (QSR International Ltd, Melbourne, Australia).

4.7 Laboratory methods:

4.7.1 Collection and transportation

The standard operating procedures for sample taking, storage and transport were modified after a dummy run and were further modified after the pilot run of seven specimens. Each research assistant carried the specimen collection and transport kits.

Biological samples for the detection of *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and *Trichomonas vaginalis* were collected in the field using two self-administered vaginal swabs, a technique for specimen collection that had been previously validated in Goa (Tanksale et al. 2003). For women who refused to take a vaginal swab, first void urine samples were collected for testing for *N. gonorrhoeae* and *C. trachomatis*. There was no alternative sample for *T. vaginalis*. The research assistants used a flip chart presentation, as well as role play, to explain how the vaginal samples needed to be taken. The quality of the swabs was important and the flip chart presentation was based on a self-taken vaginal swab validation study in Goa (Tanksale et al. 2003), and was adapted for our population. The Dacron swabs were handed to the research assistants. One vaginal swab was inserted into a sterile container for transport and stored at 4 degrees until it reached the laboratory. The

other vaginal swab was inserted into an InPouch TV culture kit (Biomed Diagnostic, San Jose, CA, USA) and placed in a field incubator until transported to the laboratory.

Five blood spots were taken according to protocol onto a #903 S&S filter paper (Schleicher & Schuell, Keene NH) (Solomon et al. 2004). They were dried fully in the field in a box specifically designed by the project for this purpose. Once dry they were placed in individual low gas permeable zip lock bags with desiccant packs and stored at 4 degrees until they arrived in the laboratory. A humidity indicator was added for quality assurance purposes.

In addition to the dried blood spot specimen, another blood spot was taken and placed into the testing well in the syphicheck rapid treponema specific test. The reagent was added and then the rapid test was read 5 minutes later. The line in the control window had to be present for the test to be valid. If the line was present in the test window the results were positive. This test measures lifetime infection with *T pallidum* and cannot distinguish between primary, early, late-latent, or treated syphilis.

Women were encouraged to also provide a venous blood sample. Those who agreed, had the sample taken by the field laboratory technician or a nurse researcher

Samples were taken throughout Goa and consequently organising the transportation back to the central office and then the laboratory required coordination and communication. All samples were first transported by car or scooter to the project office in Panjim. The swab for *N. gonorrhoeae* and *C. trachomatis* and the dried blood spots were transported in a cool box and then placed into a fridge in the Panjim

office. The InPouch *T. vaginalis* culture was placed in a 37 degrees field incubator in the Panjim office. The following morning (within 24 hours) all samples were transported to the project laboratory, which was situated in Aldona primary health care centre, one hour drive from the Panjim office. Once in the laboratory all samples, except the InPouch TV culture kit, were stored in a -70 degrees freezer until processing.

All samples were labelled with the subject's unique identification number, the date and time of collection, and the interviewer's unique identification number. A sample transport form was designed to record each stage of the transportation from collection in the field, delivery to the central office and then delivery to the laboratory. The sample was logged in with date and signature of the recipient when it arrived in the central office and was subsequently logged out when it left the office for the laboratory the next day. When the sample was received in the laboratory it was logged in and a receipt was signed, which was returned to the central office for documentation purpose and as evidence that the sample had been received by the laboratory.

4.7.2 Laboratory processing

STIs were diagnosed in a single laboratory using the following tests: for chlamydial and gonococcal infection Polymerase Chain Reaction (PCR) using the Roche Amplicor system (Roche Molecular Systems, Alameda, CA, USA); for *T. vaginalis* culture using the InPouch TV culture kit. Dried blood spots were tested for Human Immunodeficiency Virus using a standard WHO testing algorithm with Vironostika Uni-Form II plus O (Organon Teknika, Boxtel, Netherlands), HIV EIA (Ani

Labsystems Ltd, Oy, Vantaa, Finland), Murex HIV 12O (Abbott laboratories, Abbott Park, Illinois USA). The HIV BED assay for incident HIV (Calypte Biomed, Rockville, Maryland, USA) was used to test for recent HIV infections. HerpeSelect Enzyme-Linked-Immune-absorbent Assay for *Herpes simplex* virus type 2 (Focus Technologies, Cypress, CA, USA) was used to detect the seroprevalence of HSV-2.

Formative work had showed dried blood spots to be more acceptable and feasible to collect than whole blood. Whereas the HIV kits used were validated for dried blood spots, this was not the case for the Focus HSV-2 kit. Although it is reassuring that, when compared against HSV-2 testing in serum, sensitivity and specificity analysis of dried blood spots samples was 91% and 100% respectively, the sample size was only 32 and must be viewed with caution. Although the BED detuned assay had been validated for dried blood spots, the use of this assay for measuring incident HIV is complicated by the fact that late infection and people on antiretroviral therapy can be misclassified as early infection. Consequently, the incidence that we have recorded is likely to be an overestimate (Centre for Disease Control 2007; Sakarovitch et al. 2007; UNAIDS 2006).

Kits were purchased through distributors within India and so were somewhat dependent on the vagaries of the market. A particular challenge was procurement of the Roche Amplicor PCR kits for the detection of chlamydial and gonococcal infection. They had to be ordered in advance. However, as they were expensive and had a short expiry date, careful planning was required to ensure both an adequate supply at all times and no wastage. The laboratory was one of the first to perform dried blood testing in India and so several components, namely S&S paper and a

punch to create circles of a correct size for the micro-well were not available in India and had to be sourced from overseas. To overcome the challenge of frequent and unpredictable power cuts, a generator with a 24 hour guard was put in place to ensure an uninterrupted electricity supply.

4.7.3 Quality control and quality assurance

All aspects of sample collection, transportation and testing were clearly laid out in standard operating procedures. Rosanna Peeling (WHO) helped set up the PCR laboratory and Beryl West (MRC) established the standard operating procedures and trained and supervised the laboratory staff on them. Beryl West conducted regular refresher training courses for the laboratory staff on processing and testing the vaginal samples for gonorrhoea, chlamydia and trichomonas. She set up the serology laboratory and trained the staff on the HIV and HSV-2 kits that were used. She also did the initial training on taking and transporting dried blood spots.

All the research team including the data management team were fully trained by the laboratory coordinator on the standard operating procedures for sample collection and transportation. They went on to take samples in the field under supervision. The sample taking underwent the same spot check and quality control mechanisms that the questionnaires underwent.

The laboratory participated in the Quality Control for Molecular Diagnostics (UK) annual quality control tests for chlamydia and gonorrhoea (test panels sent) and quality control from National AIDS Research Institute, Pune for the dried blood spots (5% of all positive and negatives repeat tested). The laboratory also conducted in-

house sensitivity and specificity analysis for whole blood compared with dried blood spots.

Given the high prevalence of HIV there was a strict health and safety protocol. Post-exposure prophylaxis for HIV was also available. All the staff, including administrative, laboratory and researchers, were also vaccinated against hepatitis B.

4.8 Analysis Plan

4.8.1 Sample size considerations:

Sample size was chosen in order to be able to estimate a bacterial STI prevalence of 8% within 3% at 95% confidence and HIV prevalence of 30% within 5%. This gave us a sample size of 318 and 310 respectively. We did not halt recruitment until the majority of active networks had reached four waves.

4.8.2 Data cleaning and categorizing

Two independent reviewers checked all questionnaires and any inconsistencies were referred back to the field and corrected. Data were double-entered into a Microsoft Access database (Microsoft, Redmond, Washington, USA) which had been designed to detect discrepancies between the two data entry clerk inputs. All discrepancies were then cross-checked against the questionnaire by the data manager and corrected accordingly. The final data set underwent range and consistency checks. Categorical variables were checked for impossible values using tabulations and cross-tabulations and corrected or coded as missing by cross-checking with the original questionnaires.

Histograms were used to check for outliers of quantitative variables and to assess deviation from the normal distribution. Time variables were checked for consistency with each other. Validity checks were used to measure internal consistency using cross tabulations of variables measuring similar exposures.

Continuous variables were converted to categories based on published studies (e.g. age), or meaningful cut-offs e.g. 16 for age start sex work, or based on a priori definitions. Variables with several categories were simplified, where appropriate, by merging categories.

4.8.3 Outcome and exposure variables

Outcome variables were defined as follows. ‘Any curable sexually transmitted infection (STI)’ was a combined category based on having any of chlamydial, gonococcal or trichomonas genital infection. ‘Prevalent HIV’ was based on the WHO algorithm of two ELISA positive tests on dried blood spots. Suicidal behaviour was defined as self-reported attempt to commit suicide in the last three months. Exposure variables are defined in table 4.2

Table 4-2 Exposure variables based on questionnaire in the appendix and their re-categorisation for the purpose of analysis

Exposure variable	Questionnaire number and variable description	Re – categorised for the purpose of analysis
Socio-demographic & Economic factors		
Age	102 - 103 Interviewer estimate of age Based on participants self reported age, and relationship between age of marriage, menarche and age of eldest child	<20 21-25 26-30 31-35 >/=36
Ethnicity	104: Range of eight Indian ethnicities and specify	Goan Karnataka Other
Religion	105: Hindu, Christian, Muslim and other/specify	Hindu

		Non Hindu
Schooling	106: Continuous years of schooling	None Incomplete Complete to 12 th standard
Literacy	107: Ability to read or write in any language	Able to read and write Not able to read or write
Duration in Goa (migrant status)	Composite of 202, 203 and 204: Time since migrated to Goa for the first time	One year or less 2-10 years More than 10 years Since birth
Mobility	205: Travel out of Goa in the past year	Binary
Marital status	301: Married, widowed, divorced/separated and never married	Never married Married Separated / widowed
Number of dependents	601: Continuous variable	None Less than five More than five
Debt	604: Binary	Binary
Own accommodation	606: Binary	Binary
Number of children	304: Continuous	None One or more
Sex work, Sexual risk and reproductive health		
Duration in sex work	401: Continuous	Less than one year Two to ten years More than ten years
Ever worked in Baina	403 Binary	Binary
Part time sex work	402: Binary	Binary
Street based sex work	Combine 405, 406 and 410	Binary
Lodge/brothel based sex work	Combine 405, 406 and 410	Binary
Home based sex work	Combine 405, 406 and 410	Binary
Age initiate sex work	411: Continuous	<= 16 >16
Actual number of customers in the last week	417: Continuous	Less than one One to seven Eight or more
Average daily customers	412: Continuous	None One or more
Income per customer	419: Continuous	Continuous (in denominations * 100)
Number regular customers	415: Continuous	Binary none / any
Having an intimate non paying partner	307: Binary	Binary
Change in non paying partner over past three	312: Binary	Binary

months		
Consistent condom use with customers	423: Always, sometimes, some customers, never	Consistent = Always Inconsistent= Sometimes or never
Consistent condom use with non paying partner	314: Always, sometimes, some customers, never	Consistent = Always Inconsistent= Sometimes or never
Not use condoms with customer for more money	1306: Binary (confidential voting booth)	Binary
Lifetime exposure to sexual risk reduction interventions	1209: Binary	Binary
Three month exposure to sexual risk reduction interventions	1210: Binary	Binary
Source of condoms	424: Six categories	Customer brings Buy Free from NGO or clinic Never use condoms
HIV knowledge score	1204 and 1205: Continuous score out of 17	Continuous
STI treatment seeking	508: Five categories	Public or NGO Private None
Lifetime HIV test	505: Binary	Binary
Lifetime pregnancy	302: Binary	Binary
Reproductive tract symptoms in past 3 months	503: Eight different options (more than one answer possible)	Any symptoms No symptoms
Infertility	318: Binary	Binary
Lifetime induced abortions	1308: Binary (confidential voting booth)	Binary
Violence, autonomy, and social support		
Intimate partner verbal abuse	801: Yes, no, not applicable (does not have an intimate partner)	Yes, no, not applicable (does not have an intimate partner)
Intimate partner physical abuse	802 Yes, no, not applicable (does not have an intimate partner)	Yes, no, not applicable (does not have an intimate partner)
Any violence from intimate partner	Combine 801 and 802	Yes, no, not applicable (does not have an intimate partner)
Violence from others	803: Binary	Binary
No of police raids experienced over one year	806: Continuous	None One or more
Lifetime sexual	1303: Binary (confidential voting booth)	Binary

violence		
Coerced unsafe sex with customer	1305: Binary (confidential voting booth)	Binary
Family sexual abuse	1310: Binary (confidential voting booth)	Binary
Entrapment Not free to leave sex work	1001: Binary	Binary
Autonomy in use of money	1002: Binary	Binary
Political empowerment	1005: Binary	Binary
Recent lack of social support	1012: Binary	Binary
Turn to intimate partner for support	1011: Each category a new binary variable	Binary
Turn to family for support	1011: Each category a new binary variable	Binary
Turn to FSWs for support	1011: Each category a new binary variable	Binary
Substance use and mental health		
Alcohol use	1101: Five options and re-categorised	Never Less than weekly At least weekly
Smoking	1102: Five options and re-categorised	Never Less than weekly At least weekly
Chewing tobacco	1103: Five options and re-categorised	Never Less than weekly At least weekly
Measure of poor mental health	701-710: K10 score	Continuous
Deliberate self harm	904: Binary	Binary
Suicidal ideation 3 months	901: Binary	Binary
Suicide planning 3 months	902: Binary	Binary
Suicide attempt 3 months	903: Binary	Binary

The main reason for missing values for infections were that samples had not been received or inhibition of the sample occurred during the polymerase chain reaction. Seventeen (5%) of the 'any curable STI' outcomes were missing. This included; four chlamydial, gonococcal and trichomonas samples that were not received; seven

trichomonas samples alone that were not received; and six chlamydial and gonococcal specimens that were inhibitory. Only one (0.3%) HIV sample was not received. Missing cases were excluded from the analysis. One woman refused to answer the questions on suicide attempt and was excluded from the mental health analysis.

4.8.4 Description and univariate analysis

In all of the analysis, in order to adjust for potential biases in recruitment, data were weighted by the inverse of the approximate probability of recruitment (Magnani et al. 2005). The weights were calculated based on network size, age, ethnicity and area, according to how these factors were related to recruitment, using RDS Analysis Tool 5.4.0 (Cornell University, Ithaca, NY, USA). Analyses were performed using Stata 8 (Stata Corporation, Texas, USA), incorporating the weights through the survey analysis functions. Unless stated otherwise, all percentages and odds ratios quoted are weighted with 95% confidence intervals (95% CI) and frequency counts are un-weighted.

All continuous and ordered categorical variables, which were associated with the outcome in univariate analysis, also underwent a test for linearity. If there was a significant linear association they were analyzed as a linear variable in multivariate models too.

HIV incidence was calculated using the CDC consensus formula (Jiang et al. 2007).

$$\text{Incidence} = \{[(365/w)N_{inc}]/[N_{neg} + (365/w) N_{inc}/2]\} \times 100$$

W = window period, N_{inc} = number of recent HIV infections (based on the Calpyte test), N_{neg} = number HIV seronegative

4.8.5 Multivariate analysis

As I have explained in the background, hierarchical conceptual frameworks are a useful tool to understand the various levels of “risk causation”. I used such theoretically driven conceptual frameworks to analyse the determinants of HIV, STIs and suicide (Boerma & Weir 2005; Victora et al. 1997).

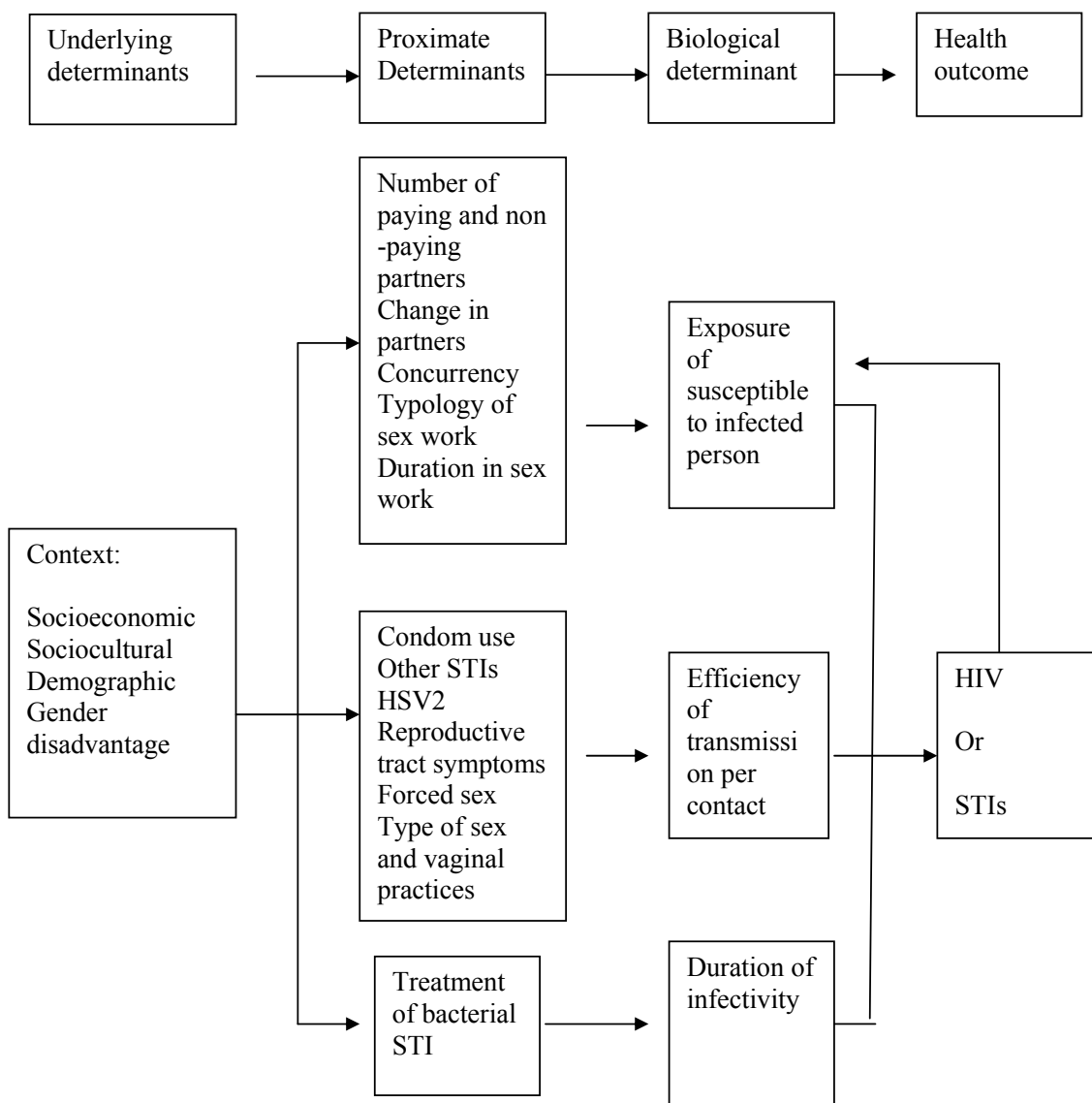
4.8.5.1 Determinants of HIV and bacterial STIs:

As demonstrated in the hierarchical conceptual framework outlined in figure 4.2, I hypothesised that, gender-disadvantage; sex-work, and health factors; together with factors indicative of social disadvantage are distal determinants of female sex workers vulnerability to HIV and STIs. The association of STIs and HIV with socio-demographic factors, type of sex-work, sexual health, and gender disadvantage is explored based on this conceptual framework.

Logistic regression was carried out with any curable STI (chlamydia, gonorrhoea or trichomonas) and HIV as the two outcome measures. Multiple logistic regression models were built separately for each outcome based on a hierarchical conceptual framework shown in Figure 4.2. First the socio-demographic factors that were found associated with the outcome in univariate analysis $p \leq 0.2$, or had been identified as a potential risk factor in the literature, were included in stepwise forward model selection procedure ($p \leq 0.2$) which led to our base model. Next the association between each sex-work, sexual risk and reproductive health factor and the outcome was individually tested after adjusting for the factors in the base model. Those factors

found associated with the outcome ($p \leq 0.2$), after adjustment, or identified, as a priori risk factors in the literature were included in the final model selection. Thus the final model was a composite of all the factors in the base model together with the above factors selected in a stepwise forward model selection procedure ($p < 0.2$). We tested for interaction between all pairs of factors in the final model.

Figure 4-2: Proximate determinants conceptual framework for examining risk of sexual transmission of HIV (Boerma & Weir 2005)



4.8.6 Associations between being an ex-Baina sex worker and HIV, STI and behavioural outcomes.

Characteristics of sex workers who had ever worked in the Baina red-light area were compared with sex workers who had never worked in Baina red-light area. The association between being an ex-Baina sex worker and curable STIs, HIV, self-reported condom use, and ever having had an HIV prevention session, were measured using multivariate analysis and adjusting for potential confounding factors. Confounders were defined as factors associated with both exposure and outcome ($p < 0.2$) and not on the explanatory pathway. Age, religion, ethnicity, marital status, socioeconomic status, number of regular and non-regular paying customers, and duration of sex-work were included as a priori confounders based on published literature. Finally, I added factors potentially on the explanatory pathway into the model to explore their effect on the relationship between curable STIs and having worked in Baina.

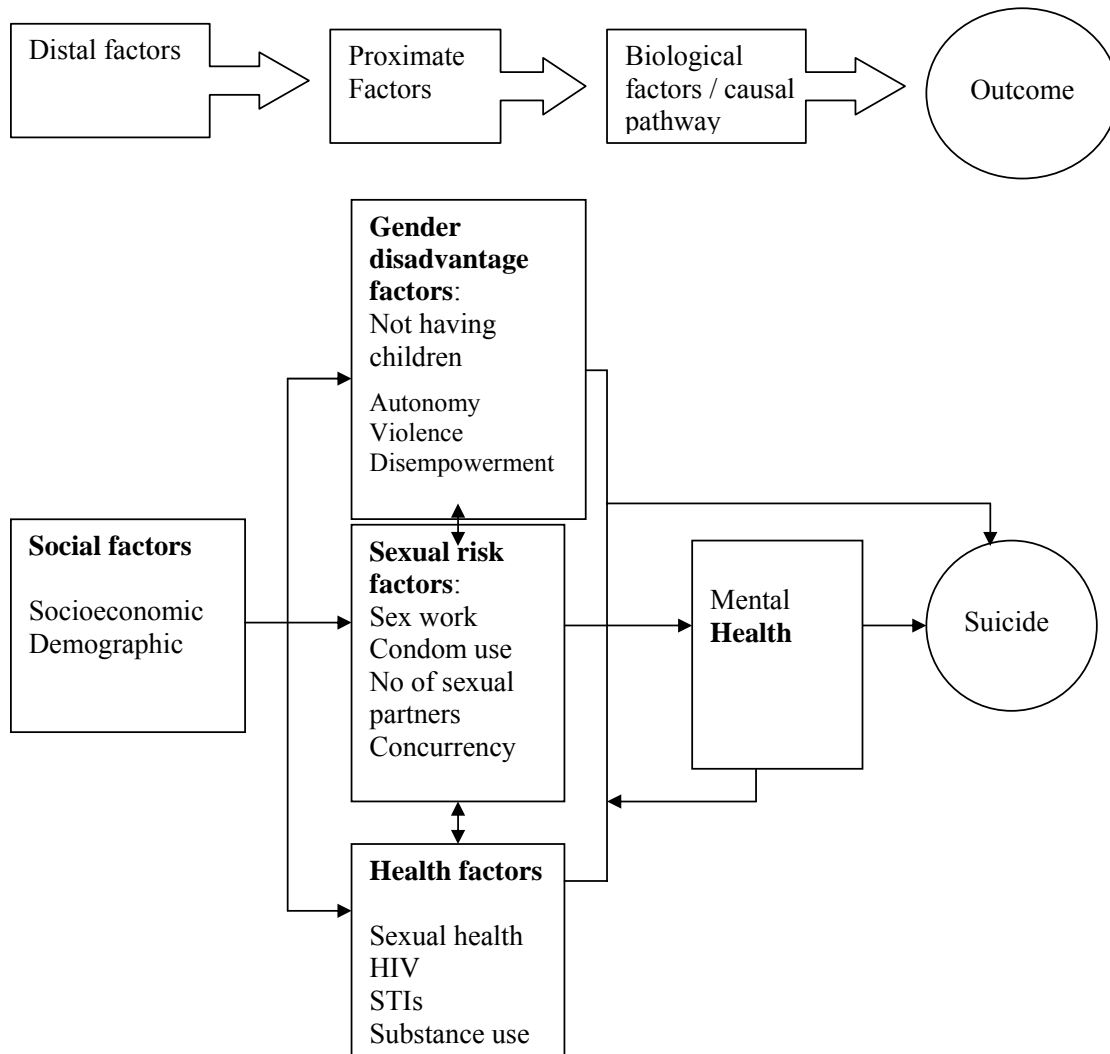
4.8.7 Determinants of suicidal behaviour

As demonstrated in the hierarchical conceptual framework outlined in figure 4.3, we hypothesised that, gender disadvantage; sex-work, and health factors; together with factors indicative of social disadvantage are distal determinants of female sex workers suicidal behaviours (Hong & Li 2007; Maselko & Patel 2008; Patel et al 2006; Pillai et al. 2008), the effects of which would be mediated through poor mental health (Vijayakumar et al. 2005). I explore the association of socio-demographic factors, type of sex-work, sexual health, and gender disadvantage, with and without measures of poor mental health, on suicide attempts in the past three months.

Logistic regression was carried out with suicide attempt in the past three months as the outcome. Multiple logistic regression models were built for the outcome based on a hierarchical conceptual framework shown in figure 4.3. First the socio-demographic (underlying) factors that were found associated with the outcome in univariate analysis $p \leq 0.2$ were included in a stepwise forward model selection procedure ($p \leq 0.2$). This led to my base-model. Next the association between each of the gender disadvantage, sex-work, and health factors with suicide were individually tested whilst simultaneously adjusting for the factors in the base-model. I present the resulting adjusted odds ratios in our tables. Those factors found associated ($p \leq 0.2$) after adjustment were included together in the final model selection. Therefore, the final model was a composite model including the factors from the base model and the above factors selected in a stepwise forward model selection procedure ($p \leq 0.2$). I then fitted the final model, with and without mental health scores, in order to examine the effect of the distal factors independently, and with potential mediating effect of poor mental health. Adjusted odds ratios of the final model with and without mental health score are presented in the tables. I tested for interaction between all pairs of factors in the final model.

:

Figure 4-3 A conceptual framework for social risk factors for suicide in female sex workers



4.8.8 Qualitative analysis:

The qualitative data were entered into NVIVO 2 (QSR International Pty, Ltd, Melbourne, Australia) software for qualitative analysis. The process of analysis started at the same time as data collection. The brief informant interviews, mapping data and participant observation was analysed in an ongoing and iterative way.

Accordingly, the contents of the observations and interviews were discussed by the team in the weekly meetings. These discussions then fed into the construction of the maps, the next stage of mapping, and the topic guides for the in-depth and key informant interviews. The participant observations in the run up to the demolition, the key informant interviews, in-depth interviews and focus group discussions, all underwent detailed content analysis through close reading by three independent researchers. The three of us read the transcripts and coded the data independently. We discussed our coding in face-to-face meetings and reached a consensus through discussion. The in-depth interviews and key informant interviews were analysed using an analytic framework that allowed concepts to surface from the raw data. These were then grouped in broad thematic headings and sub-headings. The interviews and the observational data were then re-interrogated with the themes and sub-themes that had emerged on our initial close reading of the text, as well as our particular interest in the social structuring of HIV risk in the context of the demolition.

4.9 Ethics

The ethical complexity of this study is epitomized by the haunting image of the community advisory board seeking refuge in the community centre whilst the bulldozers demolished the houses around them. The unfulfilled hope that we could halt the nightmare that befell our research participants' lay at the heart of the conflict between research and action. I have already discussed the ways in which we integrated the lack of "researcher objectivity" into the qualitative research methods. Here I will describe how we approached the ethical quagmire of "researching" violence. There were four key components to our approach. First was active

community engagement and mobilisation in the whole research process, from framing the research questions, to implementation and dissemination. Second was advocacy on behalf of the community to prevent the demolition and in support of sex workers human rights. Third was adhering to the ethical principles of respect for persons, beneficence and justice, throughout the research process. Fourth was building research capacity, with the aim of integrating it into service delivery.

4.9.1 Community engagement

The goal of this process was to engage the community to participate in the study design and implementation (Shagi et al. 2008), and was achieved through firstly conducting the study through a community based organisation, that had its origins in advocacy, and had a history of engaging sex workers, and secondly through acknowledging the power relations inherent in research and setting up structures to represent the sex worker community.

The study was implemented through an organisation called *Positive People*. *Positive People* is the oldest and largest operational NGO in Goa working in the area of HIV/AIDS. The organisation was started in 1992 by Dominic D'Souza, who was the first person to be diagnosed with HIV in Goa. He successfully campaigned to alter the draconian public health law in Goa, which had led to his incarceration shortly after his HIV diagnosis. *Positive People* was thus conceived through advocacy for the rights of people living with HIV. Their success in the Supreme Court became a milestone in establishing human rights as pivotal to HIV prevention in India, and placed them amongst the many organisations that have made community mobilisation an integral part of HIV care and prevention in India. *Positive People* has remained

proactive in HIV prevention in Goa. They were the first organisation to provide HIV prevention interventions for female sex workers in Goa. Consequently, at the time that I started working with them they had been present in Baina for more than a decade. It was through *Positive People's* outreach workers and peer educators that we first made contact with the community of female sex workers.

From November 2003 until March 2004 before the research team were in place we engaged with the community almost exclusively through this team of outreach workers and peer educators. The team of six peer educators, who were all ex-Baina sex workers and three outreach workers, were trained to disseminate the study aims and objectives as well as to provide the interface between the research team and the community. Once the research team was in place, we increased the intensity of raising the community awareness through meetings with the community leaders (brothel owners, pimps and bar owners); flip chart presentations to describe the study; and group discussion with the sex workers. The peer educators were the main link between the community and the researchers. Following the demolition new peer educators from different sex-work types and ethnicities were recruited from north Goa and Margao.

The engagement with the community was further institutionalised through the community advisory boards. The first community advisory board was organised in Baina and started work in April 2004. The brothel owners, independent sex workers, representatives of NGOs, and peer educators from all the NGOs were invited to be members of the community advisory board. The inaugural meeting was held in June 2004, two weeks prior to the demolition of the red-light area. Following the

demolitions and with the expansion of the study site to elsewhere in Goa, the Baina based community advisory board had to be reconvened with new membership. Moreover differences in geography and typology meant that several other community advisory boards had to be convened at different sex worker sites. In effect the community advisory board based in the ruins of Baina remained the most engaged and proactive. The membership of the community advisory boards convened following the demolition was made up of sex workers and peer educators, as in practice we found that once NGO workers, political leaders or gatekeepers of the sex industry were brought into the advisory board the women were inhibited and no longer expressed their views. Engagement with other stakeholders was achieved through attending NGO forums, formal and informal meetings.

Here are some concrete ways in which the community advisory board engaged with the intervention. One of the issues that were raised through the community engagement was the rationale for the laboratory testing. Consequently leaflets and flip chart demonstrations were developed and leaders and trendsetters were targeted to explain the concept of asymptomatic infection. Women were invited to the laboratory to see how the samples are processed and how anonymity is protected. At the behest of the community advisory board, in addition to treatment of sexually transmitted infections, general health care was provided for all the women and their children through a private sector voucher reimbursement system. We also used the community engagement to trace rumours and tackle them early. Finally, the objectives of the study were adapted to include the concerns of the community advisory board, to describe the effect of the demolition on health and to examine the means to provide HIV prevention following the demolition.

4.9.2 Advocacy

Our involvement in advocacy for sex workers rights started early with active participation in the “Forum for justice in Baina”, which was a loose collaboration of individuals as well as organizations advocating for the rights of the affected people of this area. Our role consisted of active lobbying of Goa State Aids Control Society (GSACS) and Goa State Commission for Women, state and national politicians, articles in the print media and appealing against the high court order in the courts. We advocated against any measures that may increase the women’s vulnerability to HIV, and in particular for the importance of continued and uninterrupted access to condoms, HIV prevention and sexually transmitted infection treatment services. We also advocated the setting up of a collective of sex workers to take forward their claims themselves. The latter was hampered by divisions between the different ethnicities engaged in sex-work as well as differences of opinion within the forum.

In the immediate aftermath of the eviction the research staff engaged in providing relief and shelter for the now homeless ex-Baina inhabitants. The provision of food and clothes was achieved through the activities of the research team in collaboration with ‘The forum for justice’ in Baina and the generosity of Goan community and religious organizations. The delivery was coordinated on the ground by the research team, *Positive People* staff and another NGO, *ARZ*. Ongoing HIV prevention intervention activities (such as condom provision) were provided discreetly as sex workers were being hounded out by those in the community that blamed them for the demolition.

Advocacy for the sex worker's right to rehabilitation continued through political lobbying and engagement of the national sex worker organisations. We published a commentary in *Lancet* discussing the potential consequences for HIV prevention (Shahmanesh & Wayal 2004). The demolition was condemned internationally by Human Rights Watch and nationally by the HIV/AIDS activists and sex worker networks. Several high profile national visits followed. The National Commission for Women visited Baina and expressed their commitment to rehabilitating the homeless women. The National AIDS Control Organisation sent a high level delegation to express its concern to the government of Goa and the Goa State AIDS Control organisation. Articles were written in the Indian national press expressing concerns at the activities of the Goa government.

4.9.3 Ethical principles

The study received ethical approval from the independent ethical committee in Mumbai and University College ethics committee. The primary beneficiaries were sex workers. The sex workers were involved in the design and implementation of the research through a network of peer educators and the community advisory boards set up in the study sites. The study questionnaire and sampling was informed by the formative qualitative study with key informants, peer educators, sex workers, and brothel owners. The results of the study were presented to the sex workers and other stakeholders in order to ensure that the intervention developed was appropriate, acceptable and evidence based.

Informed consent was an unknown phenomenon for the majority of the participants, so we used multiple methods to describe the study at a group and individual level.

We first publicised the study aims and objectives widely amongst the sex workers, using the network of peer educators and research assistants and a multitude of methods including flip chart presentations, leaflets translated into four languages, individual and group discussion. We then prepared and piloted the patient information sheet and consent form in all five relevant languages, Hindi, Konkani, Kannada, Telegu and English (see appendix). The researchers gave the potential research participant a patient information sheet in the language of their choice. In view of the low levels of literacy, they also read it out and answered any ambiguities and queries. They encouraged women to involve friends or family in the informed consent process and/or to take the information sheet and discuss with friends or family. Following this process, that often took place over more than one meeting, an individual consent form was signed or marked in the presence of a witness. Participation in the study was entirely voluntary and research participants were free to exit the study at any time.

The abrupt cessation of activity by all the organisations working in Baina following the demolition left a vacuum in HIV prevention that our research team filled. The research assistants provided a free supply of condoms, as well as information about HIV prevention and care and treatment of sexually transmitted infections to all the study participants at the time of recruitment. They were encouraged to access the study services for continued supply of free condoms for themselves and their peers. All high risk women and their sexual partners, including non-participants, had full access to these services too.

Female sex workers with a positive rapid serological test were treated for syphilis and offered a rapid plasmin reagin test. To avoid delays in treatment of the curable sexually transmitted infections (STIs) associated with batch testing, sex workers were offered presumptive therapy with azithromycin (1g) and cefixime (400mg) at the time of specimen collection and tinidazole (2g) was added if they complained of vaginal discharge. This combination was effective against treatable STIs and was commonly used in the *Avahan* projects implemented by the neighbouring Karnataka Health Promotion Trust (personal communication). All sex workers were also offered aetiological treatment for their bacterial STIs once the laboratory test results were available. Non-paying partners of SWs were offered treatment through partner notification and by patient delivered treatment systems. Sex workers were offered a test of cure three months after treatment. Effective syndromic treatment services for STIs and general health care for the sex workers and their families was provided through a voucher system for the sex workers and their families throughout the study period.

The HIV test results remained anonymous. Participants were reassured about confidentiality. They were informed that blood samples will be tested for HIV, but that results could not be traced back to individuals. Voluntary counselling and HIV testing was offered and encouraged through a voucher system to all participants through Population Services International and the government voluntary counselling and HIV testing services. Ongoing care for those found to be HIV positive was provided by *Positive People's* HIV care program.

The principles of confidentiality were strictly adhered to. All identifying features were removed from the data collected. A unique identification code was used to link the data at the time of analysis. The questionnaires and samples were all labelled with the unique identification number. The results of the HIV tests were never linked with names and given the possibility that research staff may inadvertently identify the person from the questionnaire, HIV test results were only seen by me and the laboratory staff. Data were entered into a password secured database. No identifiable information was transferred electronically. The paper information was kept securely in a locked filing cabinet away from the study site. The only place where the unique identification could be linked with personal data was the link-log that was used to give STI results back to study participants. This was kept in a separate locked drawer and destroyed at the end of the study.

In view of the clandestine and dispersed nature of sex-work in Goa, and in keeping with the principles of respondent driven sampling, we provided compensation to all the participants for their own participation and in exchange for the persons they recruited. The sum was appropriate to compensate for the amount of time they gave to travel to and participate in the structured interview. The compensation for recruitment was based on a system where we gave them three vouchers and ask them to give a voucher to three other sex workers. We then reimbursed them based on any vouchers brought by a recruit. The compensation was modest and designed to facilitate the recruitment of this hard to reach group. They were not large enough to be construed as undue incentive or coercion. Other benefits for the study participants, as described above, were access to HIV prevention information, free condoms and STI treatment.

Adverse events arising from the study were less common than we had anticipated and probably reflected the formative work done and the team's preparedness. Our approach was to pre-empt adverse events with protocols and training. However, if despite this we were confronted an adverse event we would have a debriefing and update our protocols. I will group the adverse events into three categories, violence to female sex workers, risk to study staff and underage sex workers. Sex workers experience of violence from intimate partners, local gangsters and police was high. We tackled this twofold. Firstly by allowing the sex worker to choose the time and place of the interview, and ensuring the utmost privacy at all times, we reduced the possibility of our researchers inadvertently disclosing the woman's status as a female sex worker. Thereafter, we spent time counselling the women on how best to notify and treat her partner for sexually transmitted infections, including the possibility of intimate partner violence. We had a flexible approach to partner notification and we rehearsed potential scenarios as well as offering the option of outreach workers, peer-educators or patient delivery systems to our research participants. As far as we are aware there were no incidences of intimate partner violence arising from either participation in the study or partner notification.

Sex-work became very clandestine following the demolition and police raids were on the rise. One of our concerns was that we would unmask practicing sex workers. Again the use of mobile phones, peer-educators and discretion, meant that this potential adverse event was avoided. There were several raids on the lodges in Margao and at least one of a northern coastal belt flat during our study, but none were thought to be related to our research team. In addition to the procedures the team

used to avoid putting the women in danger, they also carried first aid kits for the victims of violence, took them to hospital, and provided liaison with the legal system when a woman was arrested.

During the study none of our researchers was injured. However, they did experience several moments of vulnerability and intimidation; particularly at night, when making contact with pimps and mediators, or when caught-up in a territorial dispute. There were also several episodes in which they were nearly arrested either as sex workers or as clients. To minimise danger to the researchers, they were encouraged to work in pairs, call in their whereabouts, and carry a mobile phone and official identification at all times. The prevalence of HIV and hepatitis B was anticipated to be high and so needle-stick injuries were a major concern in the field and in the laboratory. A blood safety protocol was written and all staff, including the administrative staff, were provided with training on it and provided with hepatitis B vaccination. They were also provided with training and access to post exposure prophylaxis for HIV.

The issue of vulnerable children was one of the most difficult ones. Although uncommon, we did come across incidences of girl-children vulnerable to entry into sex-work. The concern was that, given the paucity of quality services, a heavy handed “rescue” operation would have an adverse effect on the girl and on the communities’ trust. In all cases we would establish rapport with the girl and discuss her individual case at a team meeting. If possible we would work with the girl and the family to find a solution. We also sought advice and referred them either to a specialist NGO, Child Rights Goa, or to a special committee that had been specially set up to implement Goa’s children’s act and to protect the rights of children in Goa.

4.9.4 Capacity building

One of the important aspects of the study was to strengthen the research capacity at an individual and organisational level. Two of the researchers received prestigious scholarships to do a masters in public health in the UK and have subsequently enrolled in PhD programmes with UK universities. Other members of the team have gone on to coordinate other care and prevention programmes with *Positive People*. *Positive People* has been able to use some of this improved research capacity to implement a more rigorous monitoring and evaluation of ongoing interventions.

The dissemination of the results first started with the sex workers, who through their community advisory boards became actively engaged in designing the targeted intervention they wanted. The process of adapting the research questions, overseeing the research and engaging in the dissemination, despite the restrictive conditions within which we worked, were important steps in building the capacity of the sex workers to deliver a peer driven intervention. Moreover having a community advisory board, as well as active involvement of all the NGOs, people living with HIV, government service providers, and sex workers in the final dissemination workshop has been emulated in the growing area of community based research in Goa.

4.10 Summary

Figure 4.4 provides a detailed scheme of the study methods and data collected throughout all three phases of the study.

In the next five chapters I will present the findings of the field work. As outlined in the introduction, I will present the findings of the qualitative studies in chapters five, six and seven and the quantitative survey in chapters eight and nine.

Figure 4-4: Schema of study design and data collection in three phases

Pre-demolition phase November 2003- June 2004	Immediate Post-demolition phase July 2004- December 2004	Late Post-demolition phase December 2004- December 2005
<p>Community mobilization</p> <ol style="list-style-type: none"> 1. Recruit and train Peer educators 2. Sensitization and engagement of the gate keepers (community leaders, brothel owners, pimps, motorcycle taxis, bar owners and non-governmental organizations) 3. Community awareness through group meetings and flip chart presentations with female sex workers 4. Setting up community advisory board 		
<p>Ethnographic study to inform and develop a narrative of the run up to the demolition from a range of perspectives Six researchers based in Baina Data collected using: Participatory observation, serial interviews and group discussions with sex workers and key informants</p>	<p>Forum for justice in Baina, lobbying politicians, TV and</p> <p>Relief provided to those affected by the demolition in the form of food, shelter and medical care Advocacy continued to secure compensation for the victims</p> <p>Rapid ethnographic mapping of the spatial and social reorganization of sex work Eleven researchers throughout Goa Data collected in an iterative way to map sex work through, physical mapping of the areas, site inventories, participatory observations, informal informant interviews and key informant interviews</p>	<p>In-depth qualitative study of 16 female sex workers to determine the impact of the demolition on lives and behaviours One researcher Data was collected using in-depth interviews exploring their detailed life history, current working and life conditions, changes since the demolition, and specific probes around HIV, sexual and mental health.</p>
<p>Develop the survey instruments & tools:</p> <ol style="list-style-type: none"> 1. Informed consent (IC) process <i>Translate and pilot the participant information sheet into three Indian languages</i> <i>Develop visual aids for the IC process</i> 2. Develop, translate & pilot the interviewer administered questionnaire <i>(English, Hindi, Kannada, Konkani, and Telegu),</i> 3. Standard operating procedures for data management 4. Pilot the specimen collection & transport 5. Set up the laboratory <p>Train research assistants on ethics, data collection, data management, confidentiality, specimen collection and transport; & laboratory staff on new techniques Establish quality control & assurance systems for data collection, transport, storage & laboratory testing. Set up STI clinic in Baina</p>	<p>Adapt questionnaire and other tools to the post demolition conditions</p> <ol style="list-style-type: none"> 1. Translate and pilot tools in Konkani as well as Hindi, Kannada, Telegu, and English 2. Adapt protocol for specimen collection and transportation to a wider range of field sites 3. Identify seeds for respondent driven sampling 	<p>Cross sectional survey of 326 female sex workers recruited through respondent driven sampling</p> <ol style="list-style-type: none"> 1. Interviewer administered questionnaire on the following domains <i>Socio-demographic, economic, migration and mobility, relationship with non-paying/intimate partners, sex work related factors, reproductive and sexual health, mental health, deliberate self harm, violence, substance use, autonomy and support, health seeking, exposure to HIV prevention services and knowledge about HIV.</i> 2. Confidential voting for sensitive questions 3. Laboratory samples for HIV (prevalence and incidence), HSV-2, chlamydia, gonorrhoea, trichomonas and syphilis. 4. Presumptive and etiological treatment for STIs offered to FSWs & male partners

5 The effect of the demolition of Goa's red-light area

5.1 Introduction

As discussed, interventions targeting sex workers are pivotal to HIV prevention in India (Chandrasekaran et al. 2006). Community mobilisation is considered by the National AIDS Control Programme to be an integral component of this strategy (anon 2007). Nevertheless, societal factors, specifically the legislation around sex-work and abolitionist approaches to sex-work, are potential barriers to widespread collectivisation and empowerment of sex workers (Blanchard et al. 2005; Desmond et al. 2005; Parker et al 2000; Walkowitz 1980).

In this chapter, using the data collected by participatory observation, rapid ethnographic mapping, and in-depth interviews, I will provide one of the first accounts of the effect of dismantling a red-light area on the organisation of sex-work and female sex workers' sexual risk. The events will be described from the perspective of the community with a particular focus on those aspects that affect the practice of sex-work, the sex workers collective identity, their sexual health, and the overall 'risk environment'.

This chapter is based on all three phases of the qualitative study described in the methods section. Informants were interviewed during approximately 5,000 hours of participatory observations with several hundred informants. Field researchers kept a daily record of their observations, serial interviews with informants, and brief mapping interviews in their field notes (FN). These were transcribed on a monthly basis. Maps were drawn of the area and then supplemented using an inventory to

collect additional data in a systematic manner. Sixteen in-depth interviews (IDI) with female sex workers and 34 key informant interviews (KII) were tape-recorded, transcribed, translated and then checked by the interviewer against notes taken during the interview. Three focus group discussions (FGD's) were transcribed from the tape recording with the aid of an observer's notes.

Table 5-1 Describing basic characteristics of the 16 sex workers who gave in-depth interviews

IDI Number	Demographics	Type of sex work
1	Andhra early 20s	Ex-Baina- contract SW now goes on dates to lodges
2	Andhra early 20s	Ex-Baina- contract SW now goes on dates to lodges
3	Andhra early 20s	Ex-Baina –contract SW now goes on dates to lodges
4	Karnataka late 30s	Ex-Baina – devadassi
5	Karnataka 30s	Ex-Baina – devadasi Lodge girl Mapsua
6	Karnataka late 20s	Ex-Baina – street and home-based
7	Andhra late 20s	Ex-Baina gharwali now Margao street and lodge-based
8	Goan late 20s	North Goa mobile phone girl
9	Goan < 20	Mapsua mobile phone girl
10	Goan <20	Margao street-based
11	Goan early 40s	Margao street-based
12	Marathi late 30s	Vasco street-based
13	Karnataka late 30s	Margao street-based
14	Marathi early 20s	Mapsua street-based
15	Karnataka early 20s	Calangute home-based
16	Karnataka early 20s	Coastal belt short term contract girl via Mumbai

5.1.1 Nomenclature

Non-English words are in italics without quotation marks. Quotations in double inverted commas are translations of informants and participants speech either from key informant interviews, in-depth interviews or field notes. Quotations in single inverted commas are taken directly from field notes. Direct quotations which exemplify a common paraphrased theme are also in double inverted commas. The source of a quotation is identified as (KII) for key informant, (IDI – number) for in-depth interviews and (FN) for field notes.

Gharwali is a term used for a female brothel owner in India. The closest English equivalent would be a *Madam*.

Devadasi sex-work: This is a caste based traditional sex-work common in northern Karnataka. Traditionally women of this caste were dedicated to the temples and the goddess *Yellamma* in childhood and enter sex-work through this route. The ritual of dedication to the goddess *Yellamma* was symbolised by tying of a yellow bead and *devadasi* sex workers are identified by this motif and the initiation into sex-work through the *devadasi* tradition is often referred to as tying the bead. This practice was banned in 1982, however, remnants of this form of socially sanctioned caste-based sex-work persists.

5.1.2 A note on language

There was no single language that was understood by everyone. Konkani is the dominant language of Goa and was spoken by the Goan sex workers and key informants. There are two dialects in Konkani which are broadly divided into Catholic and Hindu Konkani; with the catholic Konkani having been influenced by Portuguese. The main migrant groups which participated in the study, both sex workers and key informants were from northern Karnataka. They spoke the official language of Karnataka which is Kannada, one of the four main South Indian languages. Other languages used in the study were Telegu, another of the main South Indian language and the official state language of Andhra Pradesh, and Marathi, a cousin of Konkani which is spoken in neighbouring Maharashtra. Fishermen spoke Malayalam, another of the main South Indian language from Kerala. Although Hindi

is the official national language, it is infrequently understood in South India, particularly amongst those who had not attended school. English is a class based language and is dominant in the middle and upper classes. In Goa it was often the main language of official communication. Scripts were equally diverse with Hindi, Marathi, Kannada, Telegu and Catholic Konkani, all using entirely different scripts. Interviews were conducted in the participant's language of choice.

In this section of the findings I set the scene with a historical perspective on the emergence of the Baina as a red-light area. I then proceed with a chronological presentation of the demolition. Finally I present the more theoretical concept of the effect of the social disruption on the risk environment.

5.2 Emergence of Baina red-light area

Several key informants described Baina red-light area as evolving in response to the needs of the men working on the ships docked at Vasco da Gama port. Although there were contradictory claims on when it arose - some dating it back nearly four decades to Portuguese times and others suggesting it to be a more recent development - there was consensus on the description of early sex workers as being predominately traditional *devadasi* women from northern Karnataka.

Over time and in response to the changing economy of Goa, the small scale *devadasi* sex workers from northern Karnataka gave way to a large scale business. Fifty to sixty female brothel-owners henceforth referred to as Madams or *gharwalis*, brokered thousands of contract sex workers from rural Andhra Pradesh. This transition was depicted by a 26-year-old Baina born egg-seller as follows,

“Earlier there were few girls from Andhra Pradesh... [They came] 15 years ago.... There was one, shivaka [prostitute], from Andhra [Pradesh] she and H.L.¹² were in sex trade. While doing sex-work, they gradually started bringing girls... They paid 10,000 rupees (£125) for the girls there [in Andhra Pradesh] and made 20,000 rupees (£250) off them here...this fed into their hunger for money... and they kept on getting more and more girls... Initially only these two were there... and eventually as it went on ... those who came for sex-work also became gharwalis...and went on getting girls. [Until] they each had around 20 to 25 girls in their houses. [In contrast] Karnataka people were working on commission, ... For 100 rupees (£1.25) a commission of 2 rupees was given to the gharwalis...The gharwalis from Karnataka were not bringing girls here... they were tying the Yellamma motif here and [by] doing that, they were preparing the girls here. [These were girls whose] mothers used to work here earlier and now they have a daughter in order not to spoil the name of Yellamma [they] tie a motif to [their daughters]... and then once [their daughters] become 15-16 years old, they initiate them into prostitution...”

The key informants contrasted the modernity of the contract sex workers from Andhra Pradesh against the traditionalism of the *devadasi* sex workers from northern Karnataka. The new breed of sex worker was depicted by the same egg-seller as professionals who “*would get up in the morning, bathe, apply make-up and stand on the road*”. In contrast with the traditional sex worker who had to “*clean up everything in the house, do their Pooja [Hindu prayer] have breakfast and then [start sex work] at 12 noon.*” This contrasting image between the early and later Baina was

¹² One of the oldest of the brothel owners residing in Baina. She remained in Baina during the demolition and remained in touch with us after moving to Pune.

often couched in nostalgia for a ‘purer’ time when sex-work was less of a business and sex workers were innocent victims, in the words of one of the key informants, “*forcibly pushed into the devadasi system*”. A recurring theme was that of the brash and visible sex worker, dressed in western attire, and prepared to participate in sexual practices considered to be deviant, such as oral sex, juxtaposed against the modest *devadasi* girl, dressed in a traditional sari, sexually naïve, and innocent.

5.3 The demolition

5.3.1 Pre-demolition

Prior to the demolition, Baina sex-work was divided into independent sex workers and those who worked with *gharwalis*, either on contract or on commission. This corresponded broadly, but not exclusively, to both the ethnic and geographical division of the red-light area into Andhra and Karnataka sides.

The Andhra side consisted of around sixty *gharwalis* who contracted young women from Andhra Pradesh. The income from these contracted sex workers would exclusively belong to their *gharwalis*, for the contracted period. This was the time during which they were expected to earn back their brokerage fee (the sum of money that had been paid by the brokers to the sex workers families). Time taken off for menstruation or sickness, and the costs incurred through living expenses were added to the total. The *gharwalis* in return were responsible for health, lodgings, and finding customers. Once the debt was fully repaid the sex worker, either remained with her *gharwali* and shared her income, or became a *gharwali*, or rented a room and worked independently.

On the Karnataka side the sex workers were often traditional sex workers (*devadasi*), who had often entered prostitution at a young age. They were usually independent, paying a small commission to the *gharwalis* from whom they rented rooms and the pimps who supplied their customers. Occasionally a group of independent sex workers would join together to save money on room rental and commission.

The accounts from the women pointed to animosities, often expressed in ethnic terms, which predated the demolition. The increasingly visible sex workers from Andhra Pradesh were vilified by their traditional counterparts from Karnataka. The implication was that the more visible, brash and modern sex-work had brought undue attention to Baina and thus left them vulnerable to community antagonism,

Pre demolition there were five non-governmental organisations (NGOs) working in Baina, of which four were engaged in similar programmes of peer-education, free condom distribution and syndromic management of sexually transmitted infections (STI). The sex worker narratives described HIV changing from a virtually unknown condition, to one which dominated all of their contact with government and non-governmental services. The more senior peer educators remembered a time in the early 1990s when they were ridiculed for talking about HIV/AIDS. During the in-depth interviews ex-Baina sex workers reminisced about the early days when peer-educators and outreach workers came, performed “*skits about HIV*” and taught them how to put the condom “*on a wooden piece*”. By the time of the demolition sex workers described that it was the *gharwalis* who would insist upon condom use and complain if there were any shortages in free condoms.

“However they [gharwalis] do not compromise on condom use. Although they cannot vouch for what happens behind closed door they do check the condom disposal. This has not changed [referring to the pressures of the police cordon]. They do not want the girls to become sick and they do not want to gain a reputation as a gharwali with sick girls.” (FN-Interview with the manager who worked for one of the more senior gharwalis)

There were visible queues at the three STI clinics and interviews with the clinic doctors suggested a constant flow of female sex workers. The peer educators were introduced to any new sex workers by either her *gharwali* or one of the other sex workers.

In July 2003 a high court judgement was passed instructing the then Bharatiya Janata Party (BJP) government of Goa to demolish the brothels in Baina red-light area and to organise the rehabilitation of the female sex workers. The rationale for the judgment was to counter the immoral trafficking of women into the sex trade - the writ petition having originally been filed by a local government counsellor concerned about the exploitation of trafficked women. In practice, the government of Goa concentrated more on the expulsion of sex workers, perceived to be ‘outsiders’, more than their rehabilitation. By June of the following year they had withdrawn the alcohol licenses from the bars and restaurants, placed a police cordon around Baina, and finally demolished the brothels and the surrounding areas, without providing any of the promised rehabilitation or compensation.

5.3.1.1 Siege conditions

The police cordon was placed around Baina during December 2003. Police blocked the various routes into the red-light area and continuously patrolled the beach. One tactic used to enforce the siege was to punish customers visiting Baina. This took the form of beating, threats of arrests, demands for bribes and public humiliation, such as being forced to do sit-ups in front of the sex workers and NGO staff. Soon the harassment extended to the whole community; women and men described a barrage of abuse even when returning from the market or hospital.

The official reason given for the police cordon was to prevent criminal elements from functioning in the area. However, the sex workers believed that the real goal was to drive the sex workers away,

“ ... Cars were not allowed, cigarettes were not allowed and every thing was quite strict. [The police] started beating up customers. Extortion started at that time... After the customer entered the locality... Police would beat them up, take money from them... Yes, the police came at that time... it was before the locality was demolished... I think it was Christmas ... before Baina was closed... just before they started distributing rice. Police surrounded us... Some policemen would take money and allow boys inside...they were taking fifty rupees or hundred rupees and sending [customers]... ‘The girls should leave they should not stay here’... that is what [the police] used to say.” (IDI -3, early 20s, ex- Baina contract sex worker from Andhra Pradesh, now going on dates to lodges)

The relationship with the police during the siege was frequently juxtaposed with memories of a more amicable and symbiotic relationship, as this in-depth interview with an ex-Baina-sex worker describes,

“The old people [police] were good... Those old people never used to talk to girls. They were doing their duty well. But the newly arrived police ... beat customers and extort money from them, take money forcefully from their pockets... [And] sleep with the girls free of cost The earlier police were very good; if a hooligan came or a fight broke out they used to arrive on the scene immediately after the fight and used to catch the culprit. But the new police arrive one hour after the crime... They snatch money from the clients, beat him up and drive him from here.... They [the police] started this when Baina was about to be closed.” (IDI 1, early 20s, ex- Baina contract sex worker from Andhra Pradesh, now going on dates to lodges)

5.3.1.2 Lost income

A common theme in interviews and field notes was the severe loss of income for both sex workers and those on the periphery. The worst affected were the independent sex-workers who were wholly reliant on customers who came to the red-light area. These women would describe their hunger in vivid terms, complaining to the field workers that they were starving and unable to even afford the small sums required for a plate of *idlis* (a traditional south Indian breakfast). The reduced income from sex work reverberated throughout this interconnected community. Older sex workers and peer educators who had relied on renting out their rooms to the independent sex workers, no longer found their rooms to be in demand. The bars and restaurants where the women spent their earnings and entertained their customers were now

deserted. The destitute women who eked a meagre living from washing the sex workers' clothes or selling trinkets, and the motorcycle taxis who made lucrative business from the commissions and tips received from sex workers and satisfied customers, all found themselves without income. In the words of one of the women who washed clothes for a living,

“It has hit us in our stomach very badly. Now [the girls] don't have anything to offer, so, how can they give me? If they had something then they would be in position to share it with me.... If they had some work, then they would employ four persons.... but if they don't have work then how can they feed me? If they have something then they would give me ten to twenty rupees and I would fill my stomach. They were providing the money for our house rent, clothes and food and somehow we could have our meals.... But now, who can give us all this?”

5.3.1.3 Uncertainty

The pressure of lost income was made worse by the overwhelming feeling of uncertainty that pervaded Baina in the run up to the demolition. The waiting game led to unease, stress and despair amongst the Baina community.

The insecurity was exacerbated by the complex array of messages imparted by the authorities. The government delegated two of the non governmental organisations, normally engaged in HIV prevention, to enumerate and register the sex workers, and provide them with photo-identification to collect weekly rice and lentil rations. On the one hand the sex workers understood that if they did not register they would not be eligible for the pledged '*rehabilitation package*' and on the other hand, once

registered, they were threatened with severe penalties if they were found to be practicing sex work. Rumours circulated that the registration and rations were a ruse to identify and blacklist practising female sex workers in preparation for the demolition. The women became increasingly suspicious as they found themselves placing their fingerprint against a growing number of incomprehensible official documents and surveys,

“Every day there is a new thing and a new idea about who will be rehabilitated. [We are] very confused and scared” (FN)

Their powerlessness was exacerbated by structural factors that excluded them from the decision making process. Many of the advocacy meetings held with politicians or the public were in English. This created a clear language barrier for the sex workers as the majority spoke only their regional language and a minority spoke Hindi. Even when translation was available the hierarchical nature of the seating and discussion prevented all but the most senior community members from speaking. The apparent voicelessness of the women in such public gatherings was in stark contrast with the articulate and boisterous group discussions recorded in the field notes and during the community advisory board meetings. The community became dependent on the more educated NGO workers and researchers to decipher and translate the complex processes that were engulfing them. The inequality of this dependency on young, female NGO workers, often from a higher caste and more affluent class became a source of tension.

Underpinning this ambivalence and uncertainty, and perhaps the total unpreparedness for the demolition when it happened was the memory of a similar time in 1997. During this episode, the women would recall, how the municipality with the support of the wider community had tried to close Baina red-light area down but had failed. HL, the oldest *gharwali* recalled scenes in which the ‘*locals*’ burnt their homes and brothels and drove them into the sea, but they fought back with sticks and stones and ‘*saved*’ Baina red-light area.

5.3.1.4 Competition

The extreme competition for the few available customers heightened the ethnic tensions and divisions between the contract sex workers from Andhra Pradesh and independent sex workers from Karnataka. The latter were convinced that, ‘*the police took money from the Andhra side gharwalis and let customers in that area*’, while the independent Karnataka women starved. The *gharwalis* with the largest number of women were seen as having better connections with the police and therefore viewed as better able to bribe the police.

‘One girl on Karnataka side [was] angry and violent shouting “the Andhra Gharwalis are making their girls do oral sex and so all the clients are going to them”. Shouting at the NGOs for not doing anything [she said] “they [the AP side] have chicken Biryani and beer whilst we have nothing”’ (FN)

5.3.1.5 Deserted Baina

The ‘*padlocked cubicles*’ and the ‘*deserted lanes*’ of the red-light area, described in the field notes, were testimony to the reduced number of sex workers in Baina. A researcher who had previously worked in Baina as a photographer recorded the following passage in his diary,

“In the month of February 2004 [Baina] was an entirely different place compared to what I had seen earlier as a photographer between 1989 and 1997. In those days Baina used to be full of people and full of activity. I saw so many different types of people coming to Baina They spent lots of money. Baina had never been as sad as how I saw it in February 2004.” (FN)

A fall in contract sex workers from Andhra Pradesh was considered to be the reason for the overall reduction in numbers. Peer-educators noted a dramatic decrease in the number of sex workers on the trains from Andhra Pradesh. Sex workers explained that rumours of Baina’s potential demise had reached the Andhra villages and caused brokers to divert their trade to Mumbai and other red-light areas.

5.3.1.6 Movement for work

To continue to work during the police siege required women to meet the clients outside of the red-light area. Those who had regular customers or contacts with mediators could arrange such rendezvous. Mobile phones, which had not previously been required, became an important tool to organise sex-work.

One particular form of mobility that blossomed during the police siege was short (10-14 days) working trips to lodges in Goa and neighbouring States, called ‘dates’, described here in an in-depth interview with an ex-Baina sex-worker from Andhra Pradesh,

“Because Baina was closed, we started going out for dates for the sake of survival... [Otherwise] we would have died of starvation... [Since] the whole thing was banned by police.” (IDI 1, early 20s, ex- Baina contract sex worker from Andhra Pradesh, now going on dates to lodges)

These ‘dates’ to unknown lodges, alone and unsupported, were particularly frightening for the Baina sex workers who had rarely ventured outside of Baina.

5.3.1.7 The demolition

On 14th June 2004, following the female sex workers unanimous rejection of an attempt to be forcibly rehabilitated to a former mental asylum, the bulldozers demolished the red-light area and part of the neighbouring slum. It was during the first of the monsoon rains and no relief was provided for the several thousand families made homeless overnight. The uncertainty and disbelief meant that many had not even removed their valuables from their homes. Identity documents and gold jewellery were amongst the many items that lay buried under the rubble as men, women and children fled the bulldozers.

5.3.2 Early post-demolition

Several of the families continued to camp out in the rubble of the demolition whilst some moved into the slums of the immediate vicinity. There was considerable animosity towards the sex workers who were blamed by the community for the demolition. So they hid amongst the *'family people'*, camouflaged by exchanging the modern jeans and makeup, associated with sex work with the more traditional sari.

For the women who escaped Baina the situation remained equally precarious. Key informants suggested that Baina women had spread throughout Goa. In reality, the community antagonism to Baina sex workers, police harassment, and fines for those who accommodated sex workers, discouraged ex-Baina sex workers from resettling in Goa. The field notes provide a graphic testimony to this, as the research assistants describe arriving at one place after another in search of the evicted sex workers only to realise that they had already left, *'driven out'* by either police or a vigilante community. There was a striking similarity to the accounts coming from various parts of Goa,

"If you mean like the Baina business, there is no such business here. Immediately after the demolition [Baina sex workers] came here and stayed. But the police soon came to know about it and... sent them away. The police collected a fine of Rs.500 from each sex worker and the people who accommodated her." (KII migrant slums of Vasco)

Women either hid amongst communities or repeatedly relocated to avoid recognition. The fear of punishment, should they be seen as aiding and abetting Baina sex workers,

led the adjacent communities, to be particularly vigilant in preventing sex workers from resettling. The ethnic tensions flowed over into the post-demolition period with Andhra sex workers being the group most likely to be targeted and stigmatised. The majority of Andhra Pradesh women were forced to leave Goa and relocate to other red-light areas.

Almost all the *gharwalis* relocated, as they were unable to continue the brothel-based sex work in the more hostile atmosphere of post-demolition Goa. Moreover, although the majority of *gharwalis* had lived in Goa for decades, it was the slums of Baina to which they had moved: a tightly knit community that they were familiar with. The rest of Goa was an alien space that they were afraid to negotiate their way around. Despite the decades that they had lived in Goa, none of them spoke Konkani, the native language. Baina gave them a recognisable identity, albeit a stigmatising one

“Earlier there was Baina so we could give this address... If we were caught, the police would know that we are from Baina and they would release us after bringing us here, but now since there is no Baina, where can we claim to be our place if we are caught?”(IDI-3, ex-Baina, Andhra contract sex worker, early 20s now going on dates to lodges)

The women felt betrayed and disillusioned. During the in-depth interviews all the ex-Baina sex workers reminisced nostalgically of their previous life in Baina and the money they could earn. They described the demolition as a “*kick in the stomach*” and the old Baina developed a near mythical status,

“Oh, what money [I had]... money from foreigners, money from everyone. Money, money! I hired a room for seventy rupees (US\$1.50) a day...every morning I would give this amount... Just calculate the monthly rent of such a room!” (IDI-7 ex-Baina, Karnataka devadasi sex worker, now lodge based Mapsua).

5.3.3 Late post-demolition

The demolition of Baina red-light area destroyed the homogeneous brothel-based sex work that was concentrated in the well-demarcated red-light area of Baina; a red-light area that was notable not just for the numbers that came to visit but also as a source of girls for customers elsewhere.

“Before [the demolition] Baina was like full force. That time there was nothing this side [north Goa]. Everything was from Baina. People had to, drivers had to go there [Baina] to get girls from there and give it over here for customers (KII north Goa).

This concentrated sex work was replaced by a heterogeneous sex trade, without demarcated borders and dispersed throughout Goa. Although the accounts portray the demolition as a catastrophic force that dispersed and scattered the sex workers throughout Goa, they also contain descriptions of the embryonic forms of the new sex-work that emerged from the dust of the demolition.

The sex-work that emerged seemed to be an expansion of existing smaller pockets of sex-work outside of Baina, as well as the introduction of new modes of operation common in neighbouring Karnataka. The post-demolition sex-work in Goa attracted both Baina women who either relocated or continued to work from their homes in the

Baina slum, as well as newer recruits into the sex trade from outside Baina. The female brothel owners of Baina gave way to a new cadre of ‘pimps’ (men and women who connected clients with sex workers for a commission) who facilitated the sex trade. Part-time and informal sex workers such as construction workers and family women replaced full-time and easily recognisable sex workers.

5.3.3.1 New modes of operation

Post-demolition there was a dramatic reduction in brothel-based sex-work. Of the 57 *gharwalis* identified before the demolition only a handful continued to operate in Goa after the demolition. The vacuum left by the departure of the brothel-owners was filled by Goan pimps who brought short-term contract girls to work in the lucrative tourist belt, and lodge-owners who became more proactive in organising ‘*dates*’. Independent female sex workers became more reliant on agents, pimps and motorcycle-taxis, to arrange rendezvous with customers.

5.3.3.2 Encroachment and expansion

Baina sex workers started to make inroads into other sex-work haunts. The best described of these was the movement of ‘Baina women’ into the small-scale street-based sex-work of Goa’s large commercial hub, Margao city. The arrival of the large numbers of ex-Baina women not only led to ‘*territorial fights*’ and ‘*increased police vigilance*’, but also impacted upon the organisation of sex work in these areas. The more experienced and professional sex workers of Baina contacted the lodge-owners and displaced the pre-existing sex workers who worked there,

“...Now I find it difficult to earn even one hundred rupees...because the market is flooded with Vasco (Baina) girls...they tell me that they are not allowed to do this business in Vasco. Their huts have been demolished.” (IDI-11, Goan street based sex worker, late 30s)

This led to an expansion of the numbers of sex workers in Margao as this key informant from Margao explained,

“Prostitutes were not known by the people. When Baina was shut down then a number of them had come here [Margao]. Before we knew about ten [sex workers] and now we know about hundred. They are from Andhra, Karnataka, and Baina they have come and settled here.... Before the Baina demolition, [sex workers] were rare, four, five or six of them were there that’s all. After [Baina demolition] there were about 30-40 sex workers a day.... Before demolition if you had gone to the bus stand you might see some [sex workers] there as well as near old railway station. Now after demolition you go to any part of Margao you will get one or two.” (KII Margao)

5.3.3.3 New entrants

The demise of Baina red-light area encouraged new women in the vicinity to enter the trade. These new entrants were described as less professional sex workers, i.e. more likely to be part-time, working from home, through mobile phones, or, on the street,

“No, these girls are not ex-Baina-sex workers. They used to come to Mangor [a migrant slum in the vicinity of Baina] before Baina demolition also. But in those days nobody was interested in them. Because, even though they were young, they looked

ugly, their clothes were dirty, and they smelt bad.... But after the Baina demolition the situation changed; the same dirty, smelly, rag-pickers have become like gold”

(KII Mangor hill)

5.3.3.4 Heterogeneous dispersed sex work

The resultant sex-work included street-based sex workers that solicited in the railway stations, bus stops and municipal parks of the larger urban settings; sex workers working 10-14 day contracts in a range of lodges scattered throughout Goa; independent sex workers working from their homes and through mobile phones; sex workers on short term contracts to pimps and confined to flats in the coastal tourist belt; construction workers and women residing in slums who subsidised their meagre income with transactional sex; and the survivors of the Baina demolition who continued to work from the neighbouring area.

5.3.4 Attitude to demolition

The media and public opinion was largely supportive of the demolition. The local Catholic Church organised a large demonstration in support of the demolition. Key informants who lived and worked in close proximity to sex workers on the other hand were more conflicted about the merits of the demolition. Their main concerns were the impact on men and their wives and daughters; there was little concern or empathy for the fate of the female sex workers.

A common theme was that sex-work is a necessary evil to protect innocent women from men’s *“uncontrollable sexual urges”*. The majority of key informants were sure

that sex work would “*spread*” and delivery of HIV prevention would become more difficult. These “*unregulated*” and dispersed sex workers would thus become the source of contagion. It was a smaller minority that echoed the public perception that Baina was the source of the contagion and thus demolishing it would halt the spread of HIV.

5.3.5 The risk environment

5.3.5.1 Reduced negotiating power

Unfamiliar territory, increased secrecy, and greater reliance on pimps and mediators for customers, weakened the women’s negotiating position. They had much less control over the number of clients, or what the clients expected on ‘*dates*’ organised by pimps. The following scenario was fairly typical,

‘Three guys from Bombay had booked her for a night but the pilot had taken money for one full night plus a full day... When the girl wanted to leave the clients refused to let her go and locked her up inside the lodge.’ (FN)

According to the peer-educators, ‘*without money to eat, health was the lowest priority*’. Women were forced to take risks in order to provide food and security for themselves and their dependents. One of the private doctors, popular with sex workers, suggested that this need for money and the lack of negotiating power was leading to reduced condom use and that he was seeing more symptomatic STIs in women returning from *dates*.

5.3.5.2 Loss of community support

Sex workers described the close-knit community in Baina as being one they relied on to protect them against customer violence. They also found that the *gharwalis*' insistence on condoms used to help them enforce it,

“In Baina... one man [customer] caught me by the dress, pulled me and asked me why I did not come? So the bar boys working there chastised him...’If the girl doesn’t want to come that is her business... why are you raising your hand to this girl?’....”
(IDI-5 from Karnataka, ex Baina devadasi now working as lodge based sex worker in Mapsua).

In the same interview she describes how she used her *gharwalis* to protect herself against violence,

“Whenever I used to enter with the customer in my room, I used to tell my gharwali. If there was any trouble, I would come out of the room. I would tell customers that if you cannot behave properly then go away with your money. I would say that to such customers.”

The forced destruction of the Baina community, also, destroyed the informal social safety nets that women had depended on in the past, as this ex-Baina sex worker describes,

“Earlier, if we did not have enough money, someone would give us 10-20 rupees [with which] we could run our domestic life.... But now, even if you ask, there is no

one who can give you a single rupee” (IDI-6 late 20s Karnataka, ex-Baina SW, currently street and lodge-based)

5.3.5.3 Police raids

In the aftermath of the demolition the concern that Baina-type sex-work would spread throughout Goa led to increased police vigilance throughout Goa. Shopkeepers in the market place were requested to prevent women from soliciting and there were weekly raids on the lodges. The increased vulnerability to police raids translated into fines and bribes, which in the context of reduced custom and increased poverty, meant taking greater risks to pay back the debt. This is illustrated in the following vignette,

An ex-Baina-SW went on a ‘*date*’ to an unfamiliar lodge in northern Karnataka. Partly due to her unfamiliarity she was involved in a police raid and had to pay a large fine. Her *gharwali*, her intimate partner, and moneylenders were all reluctant to lend her money that she was unlikely to be able to pay back. Unable to raise the funds and rejected by the intimate partner that she had provided for during more affluent times, she took rat poison and killed herself.

5.3.5.4 Access to HIV prevention

Post-demolition three of the four of the organisations working towards HIV prevention in Baina abruptly ceased their activities. Service utilisation was further constrained by the sex workers ambivalence towards NGOs. Women were ‘*tired of the HIV message*’. They were angry at the negative publicity anti-trafficking and HIV

prevention brought. They blamed the NGOs for 'driving the clients away' and even blamed them for the police presence,

[Baina] was very good...By good I mean there were no police troubles. Don't get angry with me (laughs) but people like you who have been coming here and writing our names and talking to us have created the present problem. Let me tell you this on your face. Earlier there was no such problem. Two policemen would be posted in Baina for the whole night and they caused no problem... [When I first came here] not a single organization was there.... Your organization [Positive People] came here only when my second daughter was born....In Andhra, police were very strict with prostitutes and [we] always kept a safe distance from them. But in Goa, two policemen guarded the area and did their duty throughout the night... We were also relaxed in the knowledge that there were policemen in the area." (IDI 7, late 20s from Andhra, ex-Baina gharwali, now working as a street and lodge based sex worker in Margao)

Ultimately, the sex workers resented having embraced HIV prevention, only to be made a scapegoat by politicians for the HIV epidemic anyway,

He [senior politician] blamed Baina for the HIV epidemic in Goa and giving HIV to the Goan boys. ... He said that HIV/AIDS is spreading and people are suffering because of this red light area hence it is better to close it. We told him that HIV is everywhere and not just here and that the organisations are working giving awareness and condoms to prevent the spread of HIV and taking the sick to hospital. He said if it is true that the NGOs are doing all this work then why is HIV still

spreading?” (Baina gharwali describing the chief minister of Goa’s visit to Baina red-light area immediately after he left)

5.3.5.5 Access to health-care

During one week of the police cordon one of the sex workers committed suicide, another died of a septic abortion in the local hospital, and two died of acute febrile illnesses, preferring to risk a 48 hour train journey to their home-town, rather than avail themselves of public health services in Goa. This comment by a female sex worker during group discussions tries to make sense of the tragedy,

“...We are dropping dead like flies... we have no money to go to private doctors. Because we are from Baina we would have to spend 10,000 – 20,000Rs [\$200-\$400] each time we get sick. We do not have that money and the gharwalis and moneylenders are also afraid to lend us money.... So we have to go to government service and no one wants to go because there they test us for HIV and we will die anyway” (FN)

5.4 Summary points

- A concentrated and homogeneous brothel-based sex-work environment rapidly evolved into heterogeneous, clandestine and dispersed modes of operation.
- The social context of sex work that emerged from the dust of the demolition was higher risk and less conducive to HIV prevention.

- The social disruption following the demolition behaved like a negative structural intervention that fragmented sex workers fragile collective identity and agency and rendered them voiceless and marginalised.
- The creative ways in which the women adapted to their hostile and high-risk environment showed a degree of independent action that a purely structural analysis of the post-demolition risk environment would not explain.

5.5 Conclusion

The findings suggest that an abolitionist or ambiguous approach to sex-work supports a policy environment that, either criminalises this large group of women, or renders them as voice-less victims. This ultimately disempowers them and increases the stigma and exclusion they experience. For the targeted HIV prevention approaches advocated by India's National Programme to be effective, there is an urgent need for legislation and policy that supports sex workers' agency and self organisation, and enables them to create a safer working environment for themselves.

6 Becoming a sex worker: The nexus between violence, gender disadvantage and poverty

6.1 Introduction

In the previous chapter I described the effect of the demolition on sex-work in Goa. I described how following the demolition of the Baina red-light area in June 2004, the homogeneous brothel-based sex-work evolved into a heterogeneous, dispersed and clandestine sex trade. In this chapter I will describe the contextual factors that make women vulnerable to transactional sex in Goa. As in the previous chapter I have interrogated the life narratives to explore the nexus between the social context/ risk environment and self efficacy/agency.

As discussed previously, recognition that social, economic, political and environmental factors affect HIV risk has stimulated interest in structural approaches to HIV prevention (Blanchard et al. 2005; Blankenship et al 2000; Boerma & Weir 2005; Desmond et al. 2005; Gupta et al. 2008; Kerrigan et al. 2003; Parker et al 2000; Wight et al. 2006). Gender-disadvantage is increasingly seen as one of the critical structural factors influencing health outcomes in women (Manandhar et al. 2004; Maselko & Patel 2008; Patel et al. 2006). Gender-based-violence is a common manifestation of gender disadvantage and has been linked with vulnerability to HIV (Pronyk et al. 2006). Lack of autonomy, early sexual debut, limited sexual choices, poor reproductive health, and social isolation are other possible manifestations of gender disadvantage.

One of the recognised problems for achieving a public health outcome through interventions targeted at vulnerable populations such as sex workers is that the societal factors that propelled them into transactional sex may be the same ones that inhibit the very agency and self efficacy required to access better health care or adopt safer sexual behaviours (Asthana & Oostvogels 1996; Campbell 2000). In order to encourage empowerment and utilise community action to implement safer sexual behaviour it is important to understand how structural factors act as barriers to community mobilisation.

In this chapter I interrogate the life narratives to explore the commonality and differences of the route into sex-work. I pay particular attention to the contextual factors that make women vulnerable to transactional sex and may impact upon empowerment. The findings will inform upstream interventions to reduce vulnerability, as well as define the societal exposures to be examined in the survey. I present the findings using a similar nomenclature as described in chapter 5 section 1.

6.2 *Initiation*

The stigma of sex-work permeates through the narratives of initiation. Nevertheless, in contrast with the simplistic narratives of the deception and immorality put forward by the key informants, the life stories suggest a much more complex and dynamic interplay between underlying vulnerabilities, precipitating factors, and the route through which women gain entry into the sex trade. Understanding these complex pathways suggests multiple junctures for intervention.

The ubiquitous mitigating theme that emerged was violence in childhood and youth. This ranged from dysfunctional and violent family life, sexual violence and violence from intimate male partners. Unwantedness and low self esteem; young and loveless marriages; sexual naïveté and lack of life skills; were amongst other vulnerabilities that were mediated through gender. The most common events that emerged as precipitating entry into sex-work were loss of social support through bereavement or abandonment or financial need. The clearest division in the route into sex-work was between traditional caste-based sex workers and those who were either introduced by peers, or sold through a broker; however the underlying and precipitating factors for both were remarkably similar. Mostly, initiation was described as a process rather than a moment.

6.2.1 Underlying vulnerabilities

The underlying vulnerabilities described here were factors that the women described in their own life story narratives for the reasons they entered sex-work. A typical narrative would start with the experience of violence and not being wanted within the family, followed by a pubescent sexual experience, frequently violent and painful, and then entry into a violent marital home. The powerlessness, violence and neglect made her vulnerable to a precipitating event such as bereavement or abandonment. The inevitable fall into prostitution was typically facilitated by the narrator's naïveté and 'un-worldliness' at the time which prevented her from challenging her fate. Women then continued to experience violence from their lovers, pimps, brothel owners, and other sex workers.

6.2.1.1 Violent and dysfunctional families

Violence was ubiquitous in the narratives and it ranged from verbal abuse to physical and sexual violence. In the simplest narrative, women described sex-work as an escape from their dysfunctional and violent lives, as one *devadasi* sex worker living in a Vasco slum summed it up,

“My elder sister too had run away with her lover and married him. She was thrashed very badly because of that love. I had seen that and so I thought, I too would be thrashed like her and fearing this, I ran away.” (IDI-5 ex-Baina Karnataka devadasi sex worker)

Using sex-work to escape violence was the only choice for some of the women. The same woman concludes, *“That [violence] is one thing which made me leave my home. How can I live with people who beat me up?”*

More commonly, however, the violence was a manifestation of not being wanted, and thus enhanced the girl-child’s feelings of insecurity and loneliness. This childhood experience made violence normative, culminating in acceptance of abusive marital relationships or compelling the woman to seek love and security she lacked in other places. One of the Margao street-based sex workers describes a childhood of neglect and being transferred from one relative’s house to another. The psychological abuse was compounded by her mother’s disparaging attitude to her happiness and the implication that ulterior sexual motives were the only reason that others seemed to care for her,

“My aunt... took me with her saying that she would look after me. But my mother would come and say the husband of my aunt, who was a drunkard, would force himself upon me along with some other men and would make me pregnant. She used to say this to me and my heart used to ache a great deal. She used to come and say this very often, so I just lost my heart to live there.” (IDI-10, Goan under twenty street-based sex worker from Margao)

She subsequently found a lover and, despite the fact that he physically abused her, she became “*mad for Dada’s [the lover] love*”. She eventually described finding her identity through the friendship with the Margao municipal garden female sex worker gang. In her story she did not make a distinction between sex for money and sex with her lovers.

Family violence often manifested itself in the context of sex and sexual discourse, for example as a reaction to the girl-child’s real or perceived sexual desires, or in order to force her into an unwanted marriage. One street sex worker described how her maternal uncle beat her up badly when he found out that she was planning to marry a boy she loved. They accused her of maligning the family name by agreeing to an inter-caste marriage. “*I would have been happy, had I married him. I would not have fallen in such bad days*” she concluded. The perceived sexual freedom of the daughter was enough to send this father into a rage,

“[My father] used to beat mother after getting drunk. Since we were roaming here and there in our childhood, he used to get very angry with mother and used to ask her, why

she could not stop her young daughters from roaming about” (IDI- 9 Goan, under 20, mobile phone sex worker).

A street-based sex worker from Mapsua describes marrying the best friend of her lover at knife point, and then being abandoned under family duress,

“I fell in love with someone when I was studying in sixth standard. But I did not get the boy I loved. The friend of my lover destroyed my life... He took me to a temple and at the point of knife; he made me marry him, [before I had come of age]. After the marriage, we lived for four years together. Then a son was born...After his birth, his parents started opposing us....They said that unless the marriage is within their own community, it is not recognized... So they married my husband to his aunt’s daughter....” (IDI-14, early 20s Maharashtra, street based sex worker from Mapsua)

The women not only experienced violence, they also witnessed it, particularly against the women in their families. A young sex worker from Andhra Pradesh described her mother’s death with this simple statement, *“my mother was involved in a scandal and she was burnt”*. Violence was not limited to the migrant, poor or lower caste sex workers. One of the Goan mobile phone girls (IDI-9) watched as her father beat up her mother when he was drunk and then hurled abuse at her elder sister calling her a prostitute. She too was not spared the physical abuse. Another Goan mobile phone girl (IDI-8) described her humiliation when her father, repeatedly verbally abused her and called her *“fat and ugly”*.

6.2.1.2 Young marriage/ sexual initiation

Many of the sex workers had been initiated into marital sex at a very young age, often just around the time of their puberty, before they had the emotional or physical maturity or preparedness. One of the *devadasi* women describes this quite vividly,

“I was ten years old and they took me out of school and married me to an Arab. That Arab was a nice man but he gave me great troubles in bed. My age was not mature enough to take him. Still I could give birth to a child in spite of all these difficulties... [The Arab] was seventy years old, and used to give me great troubles. These people eat camel meat. They possess great vitality and you will die by that power.”(IDI- 4, Karnataka, late 30s, devadasi ex-Baina sex worker)

A common scenario described by women was being taken to their husband’s house at a young age and not being aware of *“anything about man-woman relationship, love or sleeping with man”*. They worked hard during the day and during the night fought off the unwanted advances of their youthful husbands. This denial of sex to the husband would lead to violence from the husband and his family,

“My husband would beat me because I refused to sleep with him. I really did not know anything about this, did not know anything about sex (laughs). That is why I left my husband” (IDI 7, Andhra, late 20s, ex Baina gharwali, now street and lodge based sex work in Margao)

6.2.1.3 Intimate partner violence

The violence of family life continued with their intimate partners, many of whom they had married at a young age. An Andhra sex worker describes her sexual violation at the age of thirteen,

“Although I was not sleeping with my husband, he forced himself upon me and hence I got pregnant. It was like a rape scene in Hindi movies (laughs)... we did not have any money so, a sin which should not have been committed was committed and I got the child aborted through a doctor. I did this because I had decided not to go back to my husband and so, there was no sense in carrying his child” (IDI 7, Andhra, late 20s, ex Baina gharwali, now street and lodge based sex work in Margao).

Marital violence frequently related to pregnancy or child birth as this case depicts,

“[My husband] beat me very badly and I started bleeding. He kicked my belly and there was bleeding and I aborted the fetus. It was my first pregnancy and I had completed three or four months” (IDI 6, Karnataka, late 20s, ex-Baina, street and home-based)

Beatings were often a prelude to abandonment and the husband’s family was often complicit,

“He threw me on the ground and broke my head. The people from my village, who had gathered around said, ‘don’t interfere and just keep watching. Let the woman die here, if she has to, [then] we will lodge a complaint to police’. And what did his sister do? My blood was spilled on the ground, and when people started saying all this, she came and pushed me aside. My body was stained with blood... I was bleeding profusely. Blood was everywhere, it must have been bucketfuls. So what did my sister-in-law do? She, along with her twelve year old daughter brought some ash from her kitchen and sprinkled it on the blood stains so that it would not look as horrible.” (IDI 11, Goan early 40s, street-based sex worker Margao)

Sometimes the motivation for the violence was to drive the wife from the home and leave the husband free to take another, often younger wife. This too was often with the complicity of his family, as this street-based sex workers in Margao describes,

“I was barely sixteen when I got married and came here. My husband was a construction worker and he used to get contracts for house building. Then he became enamored of a different woman and became involved in her. He started starving me and beating me up. He started beating me up every now and then I had four children. The last one was in the tummy when he started beating me....He used to beat me with anything that came to his hand, bottle, and pick-axe, anything... Frightened, I started staying away from my house. I used to sleep on the pavements. My in-laws they never used to say anything to their son.” (IDI 13, Karnataka, late 30s, street based sex worker Margao)

Despite the frequency and violence of the beatings, women would justify it by saying that they were only beaten if they had made a mistake, or if they aroused his jealousy by paying undue attention to another man, albeit a boy of ten. Alcohol frequently appeared in the narratives as a catalyst to the violent episodes. Consequently, although driven out of the family home by the violence of their husbands, many remained in contact and continued to support their husband financially with their earnings from sex-work,

“He locked me up for four days and kept me without food for four days.... [But] I was quite happy with him. It is not that he did not beat me up. He did beat me and kept me starving and yet I was happy with him... I withdrew money from the bank and gave him thirteen thousand and five hundred rupees and all my gold”. (IDI 5, Karnataka, thirties, ex-Baina devadasi now lodge-based sex work).

6.2.1.4 Sexual violence

For some women a non-consensual sexual experience acted as a catalyst for starting to exchange sex for money,

“The morning after [my first sexual experience] when I had reached home it was burning quite a lot and bleeding. Then after that I told the man [who had raped me] that I had not known anything of this kind before. It was painful - quite painful... I did not know but

there must have been some feeling. I was not in my senses¹³ when it was done. I did not know what happened and what did not happen....Then I asked him and he said that we had sex together. He said, 'it was your wish, so don't blame me'. I asked him 'did you not know that I was not in my senses?' I felt very angry at first and then after two or three months I met this girl R.... I told her that I needed money and she said, my friend will give it to you and then she introduced me to him. ...It was not for my pleasure; I was in need of money" (IDI 9, Goan, under twenty, mobile phone sex worker Mapsua).

6.2.1.5 Self efficacy (life skills, self esteem)

Not being wanted, lack of self esteem, lack of knowledge about sexuality and reproductive skills, and lack of life skills all contributed to getting into sex-work and feeling unable to leave it. The lack of knowledge about transport systems and fear of trying to find their way home was stated by several of the women as one of the reasons they didn't just leave when they realised what the job entailed.

The tales of deception that led to the first transactional encounter contained within it a huge naïveté around sex and sexuality. A young woman (IDI-3) already abandoned by her husband was shocked that her own "clan" and "caste" could "defile" her when she sought refuge in their hotel. A mobile phone sex worker (IDI-9) was pressured by financial need and the inability to say no to entertain her first client. She admitted that, *"to tell you the truth she [the peer] did not tell me what it was at the beginning. She just said that she had a friend that would give me money. He then asked what I would give*

¹³ She never quite explains why she "was not in her senses".

him in return... [So] I had to give him what he wanted". Another of the mobile phone sex workers (IDI-8) describes a similar pattern of being worn down by men asking her for sexual favours. Finally the need for money combined with a persistence of one "boy" broke down her defences. One of the Margao street sex workers (IDI-10) describes how her fondness of roaming the beaches and streets with a gang of five boys, led her into transactional sex.

6.2.2 Precipitating factors

The narratives conveyed a sense of inevitability to the process whereby they entered sex work, which partly reflected the structural barriers to agency described here. However, the narratives also contained within them precipitating factors, life events that catalysed the entry into sex-work. Many of the precipitating factors would act in consort. For example death of spouse could also result on being thrown out of the family house. Bereavement or abandonment could lead to impoverishment. The loss of social support and economic decline were the commonest precipitating factors described in the narratives.

6.2.2.1 Bereavement

The most catastrophic losses were that of one or other parent before the child came of age. Without the support of the mother, other family members were unlikely to support an unwed daughter. If the father remarried, the new wife would abandon the daughters from the previous wife. The following was a typical story,

“My mother died and then my elder brother was not taking any interest in me. My sister-in-law used to pick fights with me and I had a child who started walking...Then I came to the younger [brother], but there also it was not good...So, a man asked me, whether I wanted some work? He told me that previously I had a mother and because of her, my brothers took care of me, but now, ‘who will have time for you?’ Everyone thinks for oneself. ...I lived with his man for about four years...He looked after me well. Then he became ill and died in his place...I was confused and did not know where to go. He was paying my house rent, used to buy my provisions, and he fed me.” (IDI 6, Karnataka, late 20s, ex-Baina, street and home-based)

Following the death of a husband the family of the man would refuse responsibility for their son’s widow. A street-based sex worker describes her entry into sex work following her husband’s death,

“They were people from my place who told me go to Goa where you may get work. Your husband is no more and your brother-in-law may come and pick a fight with you. He was constantly threatening me with murder. So, I decided to leave that place in search of some work... I was working on construction site for daily wages. Once I was standing on a square and I met a woman here in Mapsua, and I was charmed by her.....and came to this business.”(IDI 14, Maharashtra, early 20s street-based sex worker Mapsua)

6.2.2.2 Abandonment

The stories of abandonment by the spouse were extremely common. Some were jilted or dishonoured before marriage, others were abandoned for another woman and some, as described above, were driven out by violence. A sex worker from Andhra Pradesh (IDI-3) had been betrothed as a child, but fell in love with another man just as she started menstruating and became pregnant. He promised to marry her but his parents circulated a rumour that she was a eunuch. The shame and abuse led her family to drive her out. A street sex worker's (IDI-13) husband took a second wife and stopped giving her money, so she started sex-work, "*what could I do?*" she said. "*You need money to eat, don't you?*"

6.2.2.3 Economic

The ultimate reason given by almost everyone was financial. Once we transcend the layers of shame and the guilt, it became apparent that there were no other employment opportunities available to these women that would provide the remuneration of transactional sex. As the following case studies suggest, although there are structural vulnerabilities and precipitating factors that push women into prostitution, there was also an economic logic and consequently a degree of agency in the decision to become a sex worker. This is an important factor that may explain why the commonest route into sex-work was through though peers. This classic tale of a street sex worker illustrates this,

“[I started this work] after the children were born and my husband died..... I knew a woman [at] this Royal petrol pump, so she talked to me about it because I needed money. I have suffered enough hardships just for survival ... I was sweeping the floor of an office every morning. I used to go there at eight o’ clock in the morning... My job was to sweep, swab and clean the toilet. Then I used to go to a house as a domestic servant and then one more house. So, I used to work at three places and return at about one in the afternoon. Then I left everything and came to this business. I have suffered enough hardships before. I was always worried about tomorrow. These days, I just don’t have the inclination to do domestic work. Recently a woman offered [domestic] work to me... But it would mean going to work in the morning. I would not be able to help my mother out in her domestic chores. My children go to school, food has to be cooked, and my mother doesn’t know how to start gas burners... So, I declined the offer” (IDI 12, Maharashtra, late 30s, street-based sex worker Vasco)

An ex Baina sex worker from Karnataka describes sitting outside of her home in the slum, when a peer approached her and said,

“‘Why should you sit on the road and do such work...which gives you barely ten to fifteen rupees..... instead, you should do something else. You will earn good money if you do something else’... Then that woman somehow made me go to Rajahmundry for this type of work [sex-work]. She used to take me there in the morning and bring me back in the evening and give me some money. I would get one hundred to two hundred rupees per week..... Then another woman came and said, ‘I will send you for some other work in

Peddapar'. This is a red light area.... that woman sent me there for fifteen days for a sum of two thousand and five hundred rupees” (IDI 7 Andhra late 20s, ex Baina gharwali, street and lodge based sex work Margao)

For some women the sums of money that they could achieve through sex-work were unbelievable, a potential route out of poverty, and thus a source of hope for the next generation,

“I became friendly to a man and he said, come let us stay together since your husband is not there and my wife too is not there, let us get engaged. I want to take you out. Are you ready to come out with me? We slept together and he gave me five hundred Rupees just for one time. I thought to myself, if I do such work, I will get so much money. I shall earn money like this and raise my children. I will provide for my children and take good care of them, will give them mother’s love and father’s love. Thinking this, I came to this business. Because of this business I could provide for all the needs of my children” (IDI 11, Goan, early 40s, street based sex worker, Margao),

6.2.3 Route

6.2.3.1 Devadasi

Traditional devadasi sex workers are young girls who through their caste-based dedication to the goddess Yellamma and the temples arrive into sex work. However, traditional devadasi sex workers also share many of the mitigating factors of their non-

traditional peers. Although traditionally the family tied the devadasi motif (a yellow bead) two of the women describe tying the bead themselves as a way of seeking the protection of the goddess Yellamma and the social sanction that being a devadasi implied,

“On my own I went to the mountain where the temple of the Goddess Yellamma is situated and asked for her forgiveness for, I not only strayed once, but twice. But [hoping] the goddess would forgive me, thinking like this I decided to tie a bead in her name... then I met a friend of mine, she said come to Pune, I will give you work. I asked her the nature of this work. She said, ‘it is such that you can make money day in and day out.’ I asked her, ‘how can such work be available?’ She said, ‘come with me, I will show you’ So I went to Pune. There my gharwali told me, ‘once you have climbed the ladder, you have climbed it forever. You cannot now climb down. A good man will never enter a liquor shop, but if he happens to enter by mistake, people would believe that he had gone there to drink. So why do you want to go back to your place now? It is such a long distance and you may be harmed on your way because you look so beautiful’” (IDI 4, Karnataka, late 30s ex-Baina devadasi)

For some the goddess brought respect and freedom from the violence of clients *“No man should harass any woman who has tied the bead of Yellamma”*, or, family,

“[I] entered this business on my own accord. Then this [Yellamma bead] which belongs to god I tied it to myself on my own... [I was] Eleven years... Once you tie this bead,

nobody in your house can say anything to you” (IDI 5, Karnataka, thirties, ex Baina devadasi, lodge-based Mapsua).

6.2.3.2 Peers

The majority of women were introduced to sex work by a peer. The manner in which they were introduced varied. Some peers provided a sympathetic ear, whilst others offered themselves as a role model. For some it was the camaraderie and friendship that appealed. Others were just shrewd brokers, who marketed the lifestyle in order to earn brokerage fees.

One street-based sex worker (IDI-14) describes being “*charmed*” by the woman who showed her the way out of daily waged construction. Similarly another woman having recently been bereaved was given solace by a woman, who later recruited her,

“I came to the bus stand and sat there... There I met a woman who was like me. She enquired who I was and where I had come from. She asked whether I had eaten and then took me to a hotel for a cup of tea. I was hungry and wanted to eat...She ordered idli¹⁴ and then tea. I told her my full story. She said, it is not good to live like this. I too was like you, but then I started the business. So, I started business too.” (IDI 6, Karnataka, late 20s, ex-Baina, street and home-based)

¹⁴ South Indian breakfast

This case is typical of the network of mobile phone girls who were often recruited through peers. She was in debt having given money to her boyfriend, who invested it unwisely,

“I met this girl who told me if you find any man who is willing to pay, tell me I will go to him and you can take commission... Earlier I would only make contacts for her. But then sometimes she would not be around. She would plan a meeting but she would not come. And then there were men who did not like her. They would say why don’t you come instead?... Once I needed money... There was a boy...He would call me daily. I used to cut him off. Then I thought let me see how this scheme works and so I went. I felt like a criminal... Having sex with another man; I wondered what if he goes and tells his friends [that he paid] 700 rupees” (IDI 8, Goan, late 20s, mobile phone sex worker)

The common theme in all the narratives was the similarity of background and experience that the peers brought to the recruitment process. It also suggests that the peers may provide an effective means of introducing the interventions to new recruits.

6.2.3.3 Sold / deceived

The female sex workers from Andhra Pradesh were often contracted into sex-work, having been ‘sold’ into sex-work. The three in-depth interviews with sex workers from Andhra Pradesh describe a similar story of being trapped in their mid teens by the brokerage fee that had been paid to a family member or friend,

“...[A woman] took me to her home, fed me and then said, ‘if you want good work, I will give you such work in a medical shop’. Promising me this, she brought me here... She took me to a gharwali and took some money...I did not like this work and I used to make a ruckus with customers and not go with them. Then [my gharwali] told me ‘that woman had taken money from me and you are supposed to repay that loan to me’. So, I started going out with customers to repay the money.” (IDI 2, Andhra, early 20s, ex-Baina contract sex worker, now lodge based)

Another sex worker describes being brokered by a woman she met to one of the Baina gharwalis,

“[The Madam] confined me to the house for two days and then she started pestering me to wear dresses. ‘Put on this dress’, she would say,’ because you have to go out’. ‘Why do I go out?’ I asked, ‘I have come here as a domestic servant’.... She said, ‘it is not the work of a maid... we have paid money there... you have not been brought here for work but for business’. I said, ‘I don’t want to do this business’. Then a big ruckus followed...’we will take you to police, and put you behind bars... you had taken our money... pay up that money’... they said....They kept me here for the six months.” (IDI 3, Andhra, early 20s, ex-Baina contract SW, now lodge based)

A home-based sex worker describes her first sex-work experience was after her husband sold her for 4000 rupees (£50) to a friend. Her marriage had been loveless as she had been in love with her cousin, who later married another woman,

“ [A] man who was known to my husband came to my husband with money to buy me. I did not know that my husband had taken money from that man. That man had come with his wife to our room. Then my husband told me to go for work with him. I said yes, since I needed work... The man did not say anything while his wife was there and then [when she left] he told me, ‘your husband has taken so much money from me so you must sleep with me’. I told him, ‘why did you not tell me this first?’ ... After getting drunk, he started telling me to sleep with him. My husband had taken four thousand rupees from that man, so he started asking for his money. I said, ‘I cannot give back your money’. So that man started harassing me quite a lot. He said, ‘you must at least have one [sexual] contact with me’. So, out of helplessness, I allowed him ...Then he asked me to keep [sexual] contact with him. I told him, this is not the way I relate to people. Then he said, ‘give me my money back, if you don’t want to sleep with me’. I said, ‘I don’t have money’ so he said in that case you keep [sexual] contact with me... I said ‘yes’ and he kept [sexual] contact with me” (IDI 15, Karnataka, early 20s, home-based sex worker Calangute)

6.3 Initiation: The view from informants

Some of the themes emerging from the key informant interviews were similar to those that emerge from the case studies, namely that most sex workers were abandoned and deserted woman in economic need and were recruited through peers. However key informants often collapsed the process of initiation down into a simple narratives, the “fallen woman”, who has nothing further to lose and naturally descends into prostitution,

the “*deceived woman*” who is naïve and unassuming and tricked into prostitution, and the “*immoral woman*” who revels in just having fun.

6.3.1 Fallen woman

Some key informants describe sex-work being the natural consequence of frivolous and pre-marital sexual experiences, particularly in a context where pre-marital sex is not considered to be a norm or acceptable for a young woman. Another bar and restaurant owner describes the scenario as follows,

“Some girl’s have boyfriends that are passing the time with them and the girls are also passing the time with them. So the cycle goes on. One boy leaves a girl and the girl goes for other boy. Then he also leaves her and, then the girl goes for other. As the cycle goes on and on and some girls become disturbed and so they enter the sex trade... What they were doing for fun, they do it for money.”

Alternatively they may have had sexual contact with someone they had loved, but if the family opposes the marriage the “heartbroken” and abandoned girl, would feel ‘*spoilt*’ and ‘*damaged*’. Consequently she would go with someone else and thus it would become a ‘*habit with her*’.

6.3.2 Deceived women

This common theme suggested that women were tricked into the profession through a mixture of naïveté and powerlessness. The following was a typical and recurring theme in the key informant interviews,

“[There was] a young and married girl, whose husband left her and she had to look after herself. She was picked up by someone and brought from Bombay to Sanquelim. And from Sanquelim she was moved to Calangute. In Calangute she was used by people... She told me, there are many of them brought from their villages. They are told that someone is going to marry them. By such false promises the men have sex with them. [Sometimes] they stay with the girl for a month. And suddenly he keeps her in one room and runs away, and then she is forced to join sex trade.”

6.3.3 Immoral woman

The central theme for this group of informants was that somehow women became corrupted by the allure of the men who bought them drinks and pay for their meals. It was an easy progression from sexual favours in exchange for gifts to sexual favours for money. As this bar owner describes,

“They [girls] don’t charge you anything but you buy them drinks, you buy them food, than next day they meet you, and then there are some more demands, small demands not big demands. Sometimes she needs money she contacts you, if she has got your phone. ‘Acha, Hi this is so and so, yah! You remember me, I want some help yah.’ So when she

asks for Rs.500/. You say okay, okay. You tell lies to your parents or borrow it from some friends and you give it to her. This goes on, once a girl gets easy access to money then that becomes her normal routine.”

6.4 Summary points

- Initiation into sex work is often consequent to gender disadvantage and violent social contexts
- Gender disadvantage manifests itself in physical and sexual violence, unwantedness, repression of sexuality and desire, entrapment, and lack of life skills.
- Becoming a sex worker is an expression of agency in a context with few other economically viable choices for women
- Women are often introduced to sex work by their peers

6.5 Conclusion

Initiation into sex work is often consequent to an abusive and violent social context, with sex-work frequently introduced as a way out or one of a few available choices for survival. Interventions therefore need to work upstream to impact upon the context within which women enter the sex trade and downstream to strengthen their agency. The female peers and mediators who introduce woman to the trade are potentially important vehicles to “deliver” HIV prevention services and reduce the adverse health outcomes of sex-work.

7 Selling sex in Goa: Typology and organisation of sex work in a tourist destination on the west coast of India.

7.1 Introduction

In the previous two chapters I described the effect of the demolition on sex-work in Goa and the initiation of women into sex-work. I described how violence and gender disadvantage, together with economic need created the conditions for women to enter the sex trade. I showed how following the demolition of the Baina red-light area the homogeneous brothel-based sex-work evolved into a heterogeneous, dispersed and clandestine sex trade. In this chapter, using data from the mapping of sex-work, key informant interviews and in-depth interviews I will describe, in some detail, the various types of women who engage in transactional sex in Goa, the organisation of sex-work and their working relationships.

There has been growing awareness of the complexity and heterogeneity of sexual risk, even within so-called “high-risk” or core groups (Blanchard et al. 2005; Desmond et al. 2005). One of the consequences has been the categorisation of core groups, such as sex workers, into types in order to identify sub-groups with varying sexual risk and vulnerability to HIV (Dandona et al. 2005; Dandona et al. 2006). This process has to varying degrees impacted upon national programmes and surveillance. For example the latest behavioural surveillance in India divided female sex workers into brothel and non-

brothel based sex workers (Indian Council of Medical Research & Family Health International 2007). Other categorisations advocated by national programmes and funders have been based on site of solicitation, for example street-based, home-based, brothel and lodge-based sex-work.

More detailed ethnographic studies have revealed that broad categories based on place of solicitation (or work) may mask huge differences in sexual risk, for example between rural versus urban, or, traditional caste based versus not, or, migrant versus non-migrant (Blanchard et al 2005; Blanchard et al. 2007; Halli et al. 2006). Moreover, typologies are neither clearly demarcated, nor mutually exclusive phenomena. Defining sex workers based on the site of solicitation though clearly logical from a programmatic point of view, fails to capture the movement of women between typologies and the ways in which different typologies adapt to the social context within which they function.

Sex-work in Goa is both varied in origin and ethnicity as well as being geographically dispersed. This offers an opportunity to explore the complex relationship between the physical space, the socio-political and historical context, the organisation of sex-work, and the implications for HIV prevention.

In this chapter I describe the features of each type of sex-work with an emphasis on how the organisation of sex-work relates to the particular geographical, historical and socioeconomic niche in which they work. I will look at the implications on community

mobilisation of sex workers and HIV prevention in Goa. The typology also forms the basis of the purposive sampling of 'seeds' for respondent driven sampling.

7.2 Typology of sex work

Traditionally, and for programmatic reasons, typology of sex work has been based on place of solicitation: brothel-based, street-based, lodge-based, and home-based sex-work. The picture of sex-work that emerges from the mapping and qualitative interviews is very diverse, lodge, street, home and brothel based sex work are all found in Goa, with various types dominating in different geographical locations. Moreover, it becomes apparent that within each type there is as much variation as between types, as well as opportunistic movement between types. Much of this variation was a result of adaptation to the peculiarities of the location and client type, as well as external factors such as police raids.

In this section I have maintained the commonly used categories, based on place of solicitation and which are also those recommended by the National AIDS Control Organisation, of street-based, lodge-based, brothel-based and home-based. I have added phone-based and mediator (pimp) based sex-work, as there were distinct groups of women who solicited only with mobile phones and pimps and did not fit within the other categories. Within each section I will describe the variations and in particular the geographical adaptation. Understanding the complexity of the typology has programmatic implication, particularly with respect to identifying the more mobile and more isolated sub types.

7.2.1 Overview of typology of sex work in Goa

Table 7-1 A schema of the typology of female sex workers in Goa

Typology by place of solicitation	Definition	Sub-types	By area
Street-based sex work	Sex workers who solicit for clients in public spaces	Street to street Street to lodge Street to home Construction workers	All Large urban settings Margao, Mapsua, Vasco and Panjim
Lodge-based sex work	Sex workers who are lodge based or meet clients in the lodges	Under contract to lodge owner Commission to lodge owner	Throughout Goa including urban settings
Home-based sex work	Sex workers who work from their own homes	Family women Ex-Baina sex workers working from neighbouring slum homes	Slums North Goa
Brothel-based sex work	Sex workers who work from a brothel owned or ran by a Madam (<i>gharwali</i>)	Baina based Massage parlours	Baina Ponda
Phone-based sex work	Sex workers who solicit customers using a mobile phone	Mobile phone girls	North Goa
Pimp-mediated sex work:	Sex workers under contract to pimps that could only be contacted via the pimp/mediator.	Short term contract women Foreign sex workers	North coastal belt

In summary - home-based and part-time sex workers dominate the migrant slums around the port city of Vasco; Street-based and lodge-based sex work dominate the urban settings of north and south Goa; part-time construction workers and the network of mobile phone girls operate in North Goa; the short term contract based sex work and night club based sex work emerged in the Northern Coastal tourist belt; and the remnants of brothel-based sex remained in the ruins of Baina slum.

Figure 7-1 Map of Goa (red arrows point to some of the areas mentioned in this section)



7.2.2 Street-based sex-work

Street-based sex workers were defined as women who solicit for customers in a public space. Street-based sex workers could be found throughout the urban centres of both north and south Goa. The public spaces that female sex workers in Goa solicit in were the street corners, municipal gardens, intercity bus stops, railway stations, markets and beaches. They took their clients to well known lodges (near the market, or railway), or to places the men recommend. Some provided their service on the railway track, behind the shrubs or in the client's vehicle. The choice of the place where they had sex largely depended on the client's ability to pay for the lodgings. As one of the more visible manifestations of sex work, they were particularly vulnerable to police clampdowns and vigilante attacks and consequently there was continuous change in the women and the soliciting sites.

Placing all street-based sex workers under the same category fails to capture the differences between those who solicited in their clearly defined territory and self identified as sex workers and those who were part-time isolated home-based sex workers who may have occasionally solicit on the road near their home. The intervention for the two would have to be different.

7.2.2.1 Mapsua

The key place for soliciting in this commercial hub of north Goa was the intercity bus terminal. Key informants described the women soliciting in Mapsua bus stand as constantly changing. They described women from throughout North Goa coming to Mapsua bus stand to solicit. Clients recognized them from *'their way of dressing, their rude remarks and gestures'* and word of mouth. The shop keepers in the vicinity of the bus stand, who observed the comings and goings and listened to the conversations on the pay phones, were also able to identify female sex workers to the potential customers.

7.2.2.2 Margao

The commercial hub of south Goa and also Goa's largest city, Margao, had several sites where women solicited. The main ones were the municipal gardens, the market place, the railway station and the intercity bus terminal. The town was divided into clearly demarcated territories. The women working in the market, municipal gardens and some of the women working the railway tended to take their clients to the nearby lodgings, whilst others took them to the railway tracks. The site of transactional sex depended on the client's ability to pay as this sex worker describes,

"Simply, they go and stand under the [Margao] railway bridge. Even before when Baina was there everybody knew that girls are available there even if the police occasionally caught the girls... If the customer has sufficient money he takes the girls to the hotels, if

not the 'poor' customer finishes his time there [under the bridge] and leaves.” (IDI-11, Goan, over 40 street-based)

Margao had the most visible street-based sex-work in Goa and so was frequently the focus of police clamp down. This often led to realignment of territories and territorial fights,

“Earlier Margao was open. Then policemen became very strict there. They say that the police stripped some people and paraded them in public so we stopped going there.” (IDI-1, Andhra, early 20s, ex-Baina contract sex worker now lodge- based)

7.2.2.3 Vasco da Gama

Although many Baina women continued to work from the slum abutting the demolished red-light area, many started to solicit on the roads leading to Baina, and on the beach. Many key informants, also, described Baina women waiting at the intercity bus terminal. Vasco municipal gardens were another well known site for soliciting. The pattern of street-based sex work in Vasco was very similar to Margao with women either taking clients to their homes in Baina, or to nearby lodges, or behind the shrubs of the municipal gardens.

7.2.2.4 Panjim

Much of the sex work in Panjim was street based on the interior roads to Miramar and St Inez. As an interview with a taxi driver indicated the go-betweens were taxi drivers on Miramar beach, the tour guides on the ferry tours and the workers on the casino boat.

7.2.2.5 Siolim

A Siolim-based taxi driver describes the street-based sex-work in this town on the northern tourist belt as follows,

“Only two or three girls are there in this business. Sometimes these girls also go to Mapsua. If the customer owns a car, they do it in car... In Siolim we have some old closed houses, owned by Catholics who are abroad. These women take their customers to such houses. Inside the compound or behind the house they do it..... Some of them stand at certain bus stop at certain time; some of them wait at the bridge. Most of them use mobile or landline phones... There is one girl in Siolim. If you want her you have to first stroll around her house or take rounds on your bike. She understands that a customer is trying to contact her.”

This narrative highlights the complexity I have alluded to in defining a sex worker entirely by the place she solicits. The same woman can solicit on the road or be contacted by phone. Sex workers, who work from home, may solicit on the roadside for customers and then take them home. Although classified as street-based the latter is

more likely to behave as a home-based sex worker and be isolated and unconnected to other sex workers.

Location-based interventions, drop-in centres, outreach work and peer educators may reach and mobilise the group of sex workers that self identify as such and have clearly defined soliciting areas. However, the isolated unconnected woman will be far more difficult to reach, or mobilise.

7.2.3 Lodge-based sex-work

Lodge-based sex work is defined as one in which the women are either based in the lodges or meet the clients in the lodge as arranged by the lodge owner or pimp. It does not include the sex workers that solicit the client in the street and then take them to the lodges. Lodge-based sex work was on the rise following the demolition in Goa. This included established lodges in Margao, Panjim, Mapsua, Colva, Porvorim and Tivim, as well as new and often transient lodges that mushroomed following the demolition. Lodge-based sex work was a feature of the urban centres, the vicinity of railway stations and transit towns on the borders between Goa, Maharashtra and Karnataka. They varied greatly and were not a prominent feature of the northern coastal tourist belt.

In addition to lodges within Goa, sex workers also visited lodges in a variety of places in Karnataka (Mysore, Bangalore, and Hubli). Women would go for ten to fourteen day '*dates*'. Some went under contract where they were paid a fixed amount, e.g. "*two thousand rupees*", and the lodge supplied the clients. Others would be based in the

lodges, but responsible for finding their own clients, through pimps or contacts. They would then either divide their income with the lodge owner, or pay them a commission.

Lodge-based sex-work proved particularly popular with the women who remained in the neighbouring slums of Baina. They describe both going on long term 10-14 day ‘dates’, and also on day trips. Some lodges could have as many as “10-15 girls”. Key informants also describe taking the Baina women to lodges throughout Goa. As this ex-Baina Andhra sex worker describes, lodges were often introduced to them by other girls. She describes a date to Hubli as follows,

“[I am] thinking of going on Monday [on a date] for ten or fifteen days.... I will earn ten thousand, nine thousand, eight thousand rupees... [The girls] stay in the lodge and the [customers] come up to the lodge accompanied by pimps. All girls wait together... After coming up, girls are shown to themthe customer selects a girl of his liking and takes her away” (IDI 1, Andhra, early 20s, ex-Baina contract SW now lodge-based)

7.2.3.1 North of Mapsua towards the Maharashtra border

There were several lodges based in the north of Goa on the transport route to Karnataka and Maharashtra (e.g. Sankhelim, Bicholim). One sex worker from Karnataka, born and brought up in Baina slums, described working in one of these northern lodges. She worked on a daily contract, she would receive half and the lodge owner half of the earnings. A Siolim-based taxi driver describes one of the lodges as follows,

“One day the hotel [in Sankhelim] was raided and it had to be closed down. Now, after four five years he has started a hotel on contract basis in Tivim, near the Railway station. Now he brings women to this hotel. I have not gone there as customer but I have drunk there. I have heard that if you want a woman you have to ring up and ask, ‘is stock (Mhal) is available?’ The room charges are Rs. 200 - for the girl and other expenditure.”

7.2.3.2 Mapsua and Porvorim

Each lodge had a different way of providing sex workers to potential clients. This sex worker, born in Baina to a family who migrated from Karnataka, describes her experiences in different lodges,

“I went to Sm. lodge in Mapsua. I went there and they released me after just one day... They said I have to sleep with the owner for free. I said ‘I cannot do it’. So they sacked me. From there I went to Porvorim by making enquires and stayed there [Ht. lodge] for two days and returned on the third day... the Madam is from Punjab.... They were kissing the girls in public so I left.... [In Sm. lodge] the girls would be seated in different rooms. I would arrive at 11 in the morning and they would pay my money in the evening” (IDI-6 Karnataka, late 20s, ex-Baina sex worker, now goes on dates).

[In Sf. lodge] she described working with seven or eight other girls for a woman in her mid 50s. There they would divide their income equally with the lodge.

Some of the more expensive lodges were run by Goans in Porvorim and had a reputation of having only Goan girls; a fact that was disputed by the sex workers who were not ethnic Goan and had worked there. A key informant from Mapsua describes Sf. lodge,

“There is a club there. People go to the club to play rummy. There is an aunty there, she makes the contacts. It is quite expensive, more than five hundred [rupees]...Sometimes there are two or three aunties. At night two girls come. They play rummy. The aunty comes and removes her clothes and dances in her underwear and bra. When she shakes her body the boys get erection. Then they tell her ‘Let’s go’ [They charge] about four to five hundred per shot but the girl has to be good looking.... Most of the aunties are from Goa. Sometimes, very rarely there is girl from outside Goa.” ’

The Ht was another such expensive lodge, with rates of around 1,000 Rupees. It was a bar and restaurant and the girls would wait for clients in the rooms.

7.2.3.3 Margao

The ex-Baina women not only moved into the street-based sex-work in Margao, but they also started to monopolise the lodge-based sex-work of Margao, as this quote from a Margao based sex worker implies,

“Since the demolition took place they come in the morning and go back in the evening. They usually stay in the G. Lodge. All of them stay there or at P. near D. temple. Those [Baina] girls frequent that lodge. They don’t give us rooms if we go there. They verify the

identity of the girls and then give them rooms” (IDI 13, Karnataka, late 30s, street based sex worker Margao)

In Margao we see the fluid nature of sex work. An *ex-gharwali* from Baina describes not only soliciting in the municipal gardens of Margao, but also sending her girls on dates to lodges throughout Goa, suggesting that women and mediators are able to move between sex-work types according to the context.

7.2.3.4 Anjuna and Vagator

The Mapsua-based key informant described another form of small scale lodge-based sex work prevalent in the small hotels of Anjuna and Vagator.

“That hotel [in Vagator] you pay the girl at the counter. The girl on the counter asks them “Do you want a shot?” per “Shot” fifty or hundred rupees, depends on the time you spend with the girl.... If the customer wants sex then she takes him to the room. The room charges are separate and sex charges are separate. [The girls] are from Goa only.... .[In] Anjuna, there are these small hotels. Two aunties are there. One is from Siolim and other from Anjuna. She is there in the kitchen as helper. The owner tells her before five in the evening that she may get customer. She waits. She gets commission. So till three in the morning this continues. The hotel owner also enjoys himself with her. He uses condom. He is happy with her. So he brings ‘business’ for her.... Suppose a customer stays in a hotel. The girl goes to his room on the pretext of dusting the room. She wears short clothes and her knickers can be seen. The customer ...asks her directly.

She doesn't reply. She just says huh! huh! huh! Then they start. Then he happily pays her two hundred rupees."

7.2.3.5 Bar and nightclub

There are several large nightclubs based in the Northern Coastal area, catering for both national and international tourists. A night club bouncer suggested that there were girls paid for by the nightclubs to dance and entertain who would also engage in transactional sex. A bar owner from the northern tourist belt described,

"The girls stay all night, they dance with the boys, they get good salary also. After that they go home or with someone or other... They charge from 500 to 1000 rupees [per sex act]."

The diversity and dispersed nature of lodge-based sex-work and the mobility of the sex workers going on 'dates' across state boundaries both pose a challenge to community mobilisation. Although HIV prevention could be delivered through the lodge-owners and a lodge-based peer, community mobilisation would require an intervention that reached the women both at the place of work and the place of recruitment. One possibility would be to use the communication/recruitment networks that enable women to move from lodge to lodge and state to state.

7.2.4 Brothel-based sex work

The majority of brothels were demolished and so this form of sex-work had all but disappeared from Goa in the post-demolition period. The few women that remained in Baina solicited in various ways. Some went on dates to lodges; others became street-based sex workers and solicited on the main road to Baina. A handful of women continued to engage in a brothel-based sex work with a *gharwali*. However, now they were more dependent on pimps than ever for getting custom. According to a sex worker describing the pimps living in the half of Baina that was not demolished, *‘these men don’t work, they just sit and eat the commission of a pimp and terrorize the place.’* Several of the key informants describe taking customers to sex workers in Baina. A motorcycle pilot describes finding a sex worker for a client,

“My friend brought [a sailor] from the ship. He phoned me saying ‘I have a sailor who is ready to pay 100 USD. So I contacted the pimp and together we went to K. building. They wanted to see the girl. So the pimp phoned the gharwalis and she brought the girl to the D. Temple.”

7.2.4.1 Massage parlours

Sex workers based within massage parlours was relatively uncommon. As one key informant said, *“I heard that for 500 rupees you get a massage and one “shot” free (laughs)...I have just heard. I have never been.”* A taxi driver explains,

“[Massage] Parlours are not happening as much here as in Gujarat... Parlours are a point of contact. Customers come in to have a massage and they make a contact [through the patron].”

Field workers were only able to identify a handful of practicing sex workers through the massage parlours. One of the main barriers to mapping the massage parlours was the reluctance of the massage parlour owners, to give access to their workers. The key informant interviews suggested that massage parlours often had powerful and influential contacts to enable them to practice and this may have been the reason for their reluctance to engage with researchers. A beach shack owner describes the trouble a neighbour of his had to stop such a massage parlour operating on his property. The owner *“pulled some strings with the top cops”*, and they called the complainant saying, *“just be quiet as long as you are getting your monthly rent don’t interfere with anything...run the show until the season is over”*

7.2.5 Sex-work through mediators

7.2.5.1 Contract girls in North Goa

This group of women was typically on short-term contracts to male, Goan pimps. They did not solicit openly in the street, bars or restaurants. Moreover they were not based in a brothel or lodge where customers could contact them directly. Instead a network of mediators and pimps arranged the meeting of the client and the sex worker. This group of sex workers were brought in from outside of Goa, and were kept in flats hired for this purpose. They were paid a relatively large amount of money for a set period of work.

However, during the contract period they were confined to the flats and had no control over whom or when they had sex.

This type of sex work was spread throughout the northern tourist belt, i.e. Parra, Candolim, Calangute, and Siolim. Similarly the pimps were networked together and consequently, if one did not have a girl to the specification of a client, he would source it from another pimp.

These contract girls were very mobile. Some were independent and received the full contract payment themselves in lieu of services provided, whilst others were already bonded to a *gharwali* and thus the pimps would sub-contract them. The pimps not only paid around 25,000 rupees (US\$500) per month for a girl but they often also had to pay the *gharwali* from whom they contracted the girl an advance. The *gharwali* then paid the girls a share of the money that she received from the pimps. Similarly if the girl came to Goa independently she would receive the full amount herself as there was no *gharwali* to pay. A contract sex worker from Karanataka in her early 20s (*IDI-16*) described the pimp giving her 20,000 rupees (US\$400) for fifteen-day contract. In addition she received tips from the customers; “*some give 100 rupees (\$2), some 500 rupees (\$10).*” She recalled once receiving a 5,000 rupee (\$100) tip from a customer.

According to key informants the girls were young and came from a variety of places outside of Goa. They were kept in flats by the pimps. The names of the same pimps recurred throughout the key informant interviews. The pimps utilized a further network

of mediators to secure business for their clients. The mediators would be based in the vicinity of hotels or restaurants, own taxis, or other forms of transport to take the women to the customers,

“In the restaurants and shacks they connect with the waiters, in the hotels they connect with the managers or reception guys. Suppose these mediators call the pimp with a customer, so the pimps will give them commission” (taxi driver northern belt)

Other potential contacts were the taxi drivers. The amount of commission they received depended on the deal. *“If the pimp quotes three thousand for a night and the taxi fellow gets the client for five thousand, the taxi fellow gives the pimp three thousand and pockets the rest. If he is not taking anything, if it is just for three thousand, he (the taxi driver) gets five hundred.”(taxi driver northern belt)*

Once the contact was made the women needed to be taken to the client. For this the pimps used rented cars with blackened windows that they changed on a regular basis. The clients were wealthy and included politicians, doctors, businessmen and foreigners. The women could be hired on a daily or weekly basis. This group were particularly hard to reach with HIV prevention interventions as they were highly mobile and had no freedom of movement,

“[The] girls are not getting out of the house...No, no [they stay] only inside the house, from morning suppose they have come from a night, morning they return so nine to six

they are in like in a jail. They are given everything they want, TV fridge and, whatever else they want but they can't go out.”(taxi driver northern belt).

Moreover, the high turnover and the youth of the girls created an illusion of *purity* for the clients and so self-reported condom use was lower than in the easily identified brothel-based sex workers of the red-light area. Women were not allowed to access health care; both health care and condom procurement was dependent on the pimps. Reproductive health knowledge was low. When they became pregnant the pimps arranged abortions in the private sector. They were bonded to the pimp and thus subject to violence,

“... Some girls do not want to perform oral sex, that's why they get beaten ... By the pimp and by the customer, the customer also beats them. They say 'I'm paying you if you do this I'll pay you more'. If she is not ready they beat them....”(taxi driver northern belt).

A further challenge to HIV prevention was the secrecy around this type of sex-work. Following the demolition of Baina there was anxiety in the northern tourist belt that sex-work would spread into the tourist belt. The concerned citizens lobbied the police and politicians, through the Rotary and Lions Clubs, to be more vigilant against the spread of '*prostitution*'. This active lobby resulted in several high profile raids of flats and arrests of contract girls and their pimps during the study period.

7.2.5.2 Foreign women

During mapping there were references to foreign and, in particular, Russian sex workers. However, researchers were unable to find much concrete evidence and this group remained the most elusive.

Similarly there were references made by key informants to girls from the catering colleges that were prepared to exchange sex for large sums of money, so called '*call girls*' or '*party girls*'. Our mapping suggested that there was an overlap between so called '*call girl*' and the contract sex workers and mobile phone-based sex workers.

7.2.6 Home-based sex-work

7.2.6.1 Family women

The long-term slums that had developed to house the armies of migrant labour in the industrial setting of the port town Vasco, and the commercial hub of Margao, were home to part-time and non-professional sex workers that were described as '*family women*' by the key informants. These women, who were integrated within the fabric of the slum, were described as providing sexual favours implicitly or explicitly in exchange for material goods. Key informants and the women used the terminology of '*extramarital affair*' and '*prostitution*' interchangeably for this group of women. This semantic confusion seemed to be integral to this type of transactional sex, many of whom would not describe themselves as sex workers. A key informant from Mangor Hill describes the informal nature of the transactional sex as follows,

“Their husbands are mostly drunkards. What do their wives do? They have affairs with other men... In this they need not ask for money.... These fellows understand the women’s needs. So they themselves give money to these women, not for that sex-work she rendered but to solve her financial problems.”

Moreover, the family were often implicit in this form of transactional sex. The home-based sex worker (*IDI-15*) described her husband selling her sexual favours to his friend. A nurse depicted transactional sex in her slum, Zuarinagar as integral to the running of the household,

“There is no need to go to the lodge or hotels, because here the [women] can do their [sex] work. The family members are supporting them and even their husbands are supporting...I don’t think they are getting paid but they may get good food and clothes and if it is a permanent customer they will give the monthly rent of the house... most of the permanent customers have their wives and children in their native place”.

7.2.6.2 Construction workers

Another type of indirect and part-time sex work that was described were the day labourers that migrated, mainly from northern Karnataka to find work in the booming construction business in Goa. The women were paid 80 rupees (£1) per day for their labour. If they failed to find a day job they would engage in transactional sex to supplement their income.

A woman coming from a village in Northern Karnataka described it as such,

“Once I was standing on a square [waiting for construction work] and I met a woman here in Mapsuar... she said to me, you can make money in just five minutes, so why should we go for backbreaking labour? And then she started taking me with her. She would give me fifty rupees and would keep one hundred rupees with her. Later on you can’t shake this habit.”(IDI 14, Maharashtra, early 20s, construction sex worker Mapsua)

She described taking her customers by public bus to the jungle. Although she felt safer in the lodges, she would have to pay 100 rupees for fifteen minutes and 150 rupees for couple of hours. She described several other women from Karnataka who work in a similar way to her. They often had to also provide sexual favours to the “hamals” (porters).

The challenges for HIV prevention for these two very different forms of home-based sex work was that neither the women or the “client” identified this group of women as sex workers and consequently their perception of risk was very different than if they were having sex with brothel-based sex workers. This was reflected in the low levels of condom use reported in the interviews. On the other hand, the key informant interviews suggested that either the women or their clients were short term migrants, suggesting that

they were in fact “higher risk” than the part-time and non-professional nature of their work may imply.

The other challenge was different for the two groups. The construction workers were working women with a strong collective identity and thus could potentially be reached through a targeted peer driven intervention. The ‘*family women*’, on the other hand, were isolated, hidden and without a clear unifying identity. Targeted interventions would either fail to reach the most vulnerable, or could ostracise an already stigmatised group of women.

7.2.7 Phone-based sex work

A key theme during the mapping was the increasing use of the mobile phone to organise the sex trade. During the police cordon Baina-based sex workers would organize their rendezvous with regular clients using mobile phones. Following the demolition female pimps describe using their mobile phones to organize the clandestine sex trade within the sprawling urban slums surrounding the industrial hub and port town of Vasco. Clearly there is an overlap between various types of sex workers who may organize meetings with regular clients by mobile phone. Here I define women as phone-based sex workers if they organize their work exclusively through mobile phones. A NGO outreach worker describes the following,

“Regarding Sada and Mangor he mentioned that there are call girls who operate in these areas and they are from good families. There are groups of 20-25 girls and these girls

charge approximately Rs2, 000 - Rs5, 000 and above. They operate through mobiles. There is a lady who is in control of these girls and she supplies them with customers. These madams are from Chicalim, Shantinagar and Sada. There are approximately 6-7 of them. These girls are usually college students or housewives. These madams approach the girls and include them in their group.... there are family women in trade who are largely migrants but there are a few Goan women as well.” (FN)

A separate network of independent women in the north of Goa organized their work through mobile phones. The latter were distinguished by their high level of education, referred to by key informants as ‘college girls’, and their initiation came through various sales jobs for example selling insurance. One of the mobile phone sex workers from the north of Goa describes how the clients contact her,

“These people know my number so they tell other people. When a customer contacts me on the phone, who I don’t know, then I ask him who gave him my number. I tell him, I am afraid of going out with a stranger then he tells me not to be afraid and then he comes to pick me up.”

The girls were young and their sexual naïveté and lack of reproductive health knowledge revealed during the in-depth interviews was striking. Paying for sex with the mobile phone girls had the veneer of safety; their youth, education and non-migrant status suggested a lower risk of HIV and infection to the clients. The networked nature of their

business, suggests that a peer-driven intervention would be feasible; albeit challenged by the competition and fear of exposure inherent to this group.

7.2.8 Mediators:

With the demise of brothel-based sex-work in an open and easily accessible red light area mediators or ‘pimps’ became increasingly important to secure customers. Some of the pimps were sex workers or small *gharwalis* supplementing their meagre income with commissions for work. Some of the mobile phone sex workers acted as mediators for other sex workers in their network, and male pimps in northern Goa brought women in on contracts to service the hotels in the northern belt.

A motor cycle pilot explains that ten pimps continued to bring customers secretly from the beach to the remaining Baina women. It was through these pimps that he still managed to find girls for his customers. With the desperate search for new working sites, other sex workers became a very important source of information, ‘*Suppose one girl from Baina is doing trade in Mapsua, she will bring more girls*’. Sometimes women introduced other women to clients for a commission, this was very common amongst the mobile phone networks of northern Goa. A night club bouncer described how an ex-contract girl started her own business, as she knew all the contacts and go-betweens from her working days.

One group of pimps from the northern coastal belt brought contract girls into Goa. The raid of one of their houses shed some light on their working arrangements. A taxi driver

describes the reason for the raid was that the pimps refused to pay the local boys the bribes they had asked for and consequently they reported them to the police. The pimp was then rearrested two weeks later, when he had moved out of Mapsua, where he was well known, to Calangute, where the police had not been bribed.

A specific group of mediators described by the beach shack owner were the beach boys, young boys that work in the beach shacks and look after the sun beds. During the season thousands of men, women and children migrate to Goa to work as beach hawkers. There were suggestions from the key informants that some of the beach hawkers were involved in transactional sex and the beach boys and bed boys were the mediators for these transactions.

The complex organisation of sex work, with diversity of both sex workers and mediators, places a particular challenge on HIV interventions that have traditionally targeted the gate keepers.

7.3 Summary points

- Sex work in Goa was diverse and dispersed
- The historical context, geographic peculiarities, client type, and law enforcement all acted to define the way in which sex-work organised in each locality
- In addition to street, lodge, home and brothel-based sex-work we identified mobile phone based and mediator-based sex work in Goa

- Even within type, based on place of solicitation, there is tremendous heterogeneity in the practice of sex work
- Types are fluid and responsive to changing context and need
- The various types and organisation of sex work have huge implications for the sex workers risk environment, health needs and intervention delivery.

7.4 Conclusion

The strong relationship between the historical, social, geographical, and political peculiarities of the context of sex-work organisation is further evidence of the need to identify the factors that determine the riskiness of the working environment in order to guide sex-work policy. Sex-work types that are clandestine, isolated and mobile are particularly challenging for HIV prevention interventions, as are conditions that lead to diverse and geographically dispersed sex trade. Sex-work is adaptive to changing circumstances and newer technologies, such as mobile phones. Interventions need to be equally adaptive; remain abreast of the changes and incorporate them into intervention design. Public health advocacy needs to address policy and legislation, such as criminalisation of clients, which could increase the mobility, invisibility, and dispersion of sex workers

8 HIV and sexually transmitted infections amongst female sex workers in Goa

8.1 Introduction

In the previous three chapters I described the events leading up to the demolition of Goa's red-light area. I explored the effect of the demolition on the risk environment and the organisation of sex-work. I described the conditions that made women vulnerable to entering the sex trade and the organisation of sex-work in Goa, and explored some of the structural factors that could enhance the women's vulnerability to HIV and sexually transmitted infections. In this chapter I will present the findings of the quantitative survey of HIV and curable sexually transmitted infections (STIs) in female sex workers in Goa.

On the eve of the demolition there was still a dearth of data on the size of high-risk groups such as female sex workers, the epidemiology of HIV and STIs, and how the individual and structural factors interact to shape vulnerability to HIV. Gender-disadvantage; sex-work, and health factors; together with factors indicative of social disadvantage were potential distal determinants of female sex workers vulnerability to bacterial STIs and HIV, the effects of which would be mediated through access to behavioural and STI treatment interventions (Boerma & Weir 2005).

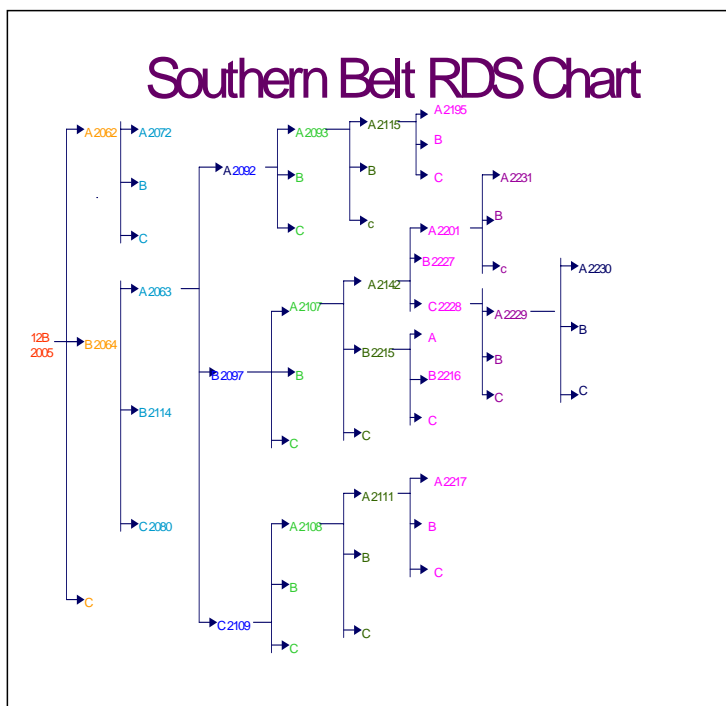
In this chapter I will describe the characteristics and burden of HIV and STIs of the 326 female sex workers (FSWs) that participated in the cross-sectional survey. I will explore the determinants of STIs and HIV infection, with particular focus on the

relationship between the underlying societal factors and the more proximal behavioural and sex-work related factors. In the final section I will compare the sex-work concentrated in Baina with the dispersed sex-work that materialized in the aftermath of the demolition.

8.2 Description of Sample

326 sex-workers from 35 different respondent driven sampling (RDS) networks

Figure 8-1 One of the RDS networks from south Goa



throughout Goa

were recruited.

Fifty-nine seeds

were selected

based on the

findings of the

typology

described in the

previous chapter.

Thirty-five of the

seeds recruited

women into the

study. Based on

our extensive mapping we became aware of sex worker networks that we were unable

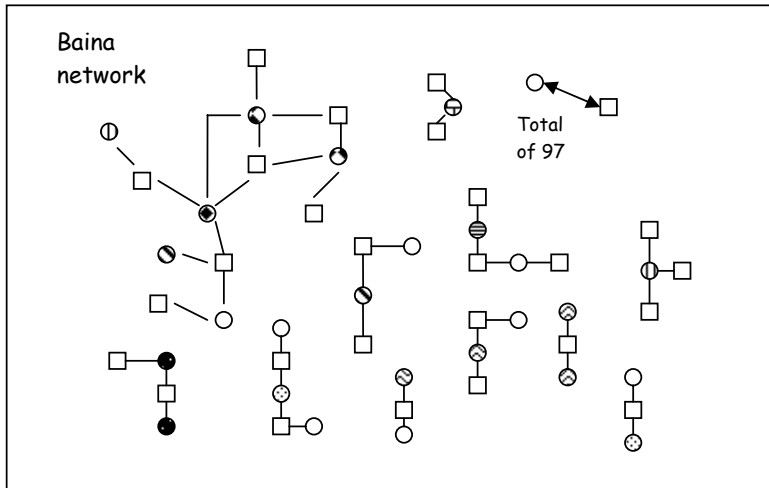
to recruit; these comprised mainly of women who did not self-identify as sex workers.

We recruited up to 6 waves, with recruitment networks comprising of two to thirty

participants. All the areas of Goa, and different types of sex work that were identified

during mapping presented in chapter 7, were represented in the sample, with the

Figure 8-2 a sexual network diagram



exception of foreign sex workers. Median size of the participant's social network of sex workers, from which they could

have potentially recruited, was 3, with a inter quartile range of 2-5. Some women had no other sex workers in their social network and others knew up to 100 sex workers in their personal network.

We found that the recruitment network sizes varied considerably across the state with the largest networks amongst the women from Karnataka living in areas closest to the red-light area as well as those who engaged in part-time sex-work to supplement their earnings as day labourers in the north. The geographically distinct networks were interlinked by sex with non paying partners or pimps (see the sexual network diagram, (Fig 8.2) ¹⁵

¹⁵ Key: The circles represent FSWS – similar shading represents FSWS recruited through the same seed. Squares represent regular male partners

8.3 Description of sex workers in Goa

8.3.1 Sexually transmitted infections and HIV

Bacterial and viral sexually transmitted infections were common. Seventy-seven women (25.7%), with a 95% confidence interval (CI) of 21.0 to 31.1, had prevalent HIV infection. Based on BED assay incidence of HIV was estimated to be 4.7% (CI 2.4 to 8.8) per annum¹⁶. Prevalence of chlamydia was 7.3% (CI 5.1 to 10.5, n=30), gonorrhoea 8.9% (CI 6.2 to 12.7, n=30), and trichomonas was 9.4% (CI 6.6 to 13.2, n=31). Prevalence of at least one of the three curable STIs (gonorrhoea, chlamydia, or trichomonas) was 22.0% (CI 17.7 to 27.0, n=75). Antibodies to HSV-2 were detected in 57.2% (CI 51.5 to 62.7, n=182) women. TPHA, a measure of lifetime exposure to treponemal infection, was positive in 29.3% (CI 24.3 to 34.9, n= 84)

Of the 75 women in whom curable STIs were detected and treated, 57 (76%) were traceable for retesting of vaginal swabs three months following adequate treatment, of which nine (16%) had either gonococcal, chlamydial or trichomonas infection.

8.3.2 Demographic and psychosocial characteristics

Table 8.1 showed that female sex workers in Goa were predominately migrant, young and illiterate. The majority had been married at some point and had children. More than half were indebted, with debts ranging from 200Rs – 200,000Rs (US\$4- US\$4000) and 90% supported dependents.

¹⁶ See methods and discussion regarding the limitation of BED assay to measure HIV incidence

The women were highly mobile and the majority had migrated from elsewhere in India. The commonest migration route described was to and from northern Karnataka. Although 89% were of a non Goan ethnicity, only 75% had migrated to Goa during their lifetime suggesting that a proportion were born in Goa to long-term migrants. Of the 185 (58%) women who had travelled in the previous year 133 (70%) had travelled to Karnataka, of which 90 (68%) had travelled to destinations in northern Karnataka. The majority of the remaining 30% travelled to Maharashtra and Andhra Pradesh. Nineteen percent of their intimate male partners were resident in another state.

Women experienced high levels of intimate partner violence, sexual violence and violence from others, including the police. Thirty-five percent of women experienced intimate partner violence, 9% experienced sexual violence, 27% were coerced into unsafe sex with a client, and 14% were involved in a police raid over the past year. The majority had some autonomy in decision making. Two thirds had no-one to turn to for support in the past week, one third turned to other sex workers for support. Self harming behaviours and poor mental health were common (see chapter 9 for details).

Table 8-1 Demographic and psychosocial characteristics of 326 female sex workers in Goa

Variable	Number (N=326)	Weighted prevalence % (95% CI)
Socio demographic		
Age, years		
<20	35	8.7 (6.2 to 12.2)
21-25	100	29.0 (24.2 to 34.2)
26-30	79	25.7 (21.0 to 31.0)
31-35	43	13.8 (10.3 to 18.2)
36-40	40	13.0 (9.6 to 17.4)
>40	29	9.9 (6.9 to 14.0)
Ethnicity		
Goa	54	11.2 (8.6 to 14.5)
Karnataka	200	71.7 (66.9 to 76.1)
Andhra Pradesh	37	9.9 (7.2 to 13.4)
Other	35	7.2 (5.1 to 10.0)
Religion		
Hindu	223	72.3 (67.2 to 76.9)
Christian	41	10.0 (7.4 to 13.5)
Muslim	60	17.1 (13.4 to 21.6)
Other	2	0.6 (0.1 to 2.3)
Unable to read or write	255	82.1 (77.6 to 85.8)
Schooling		
None	199	67.1 (61.9 to 72.0)
Incomplete	117	30.9 (26.1 to 36.1)
Complete (12 th standard)	10	2.0 (1.1 to 3.8)
Marital status		
Married	134	40.3 (34.9 to 45.9)
Widowed/separated	101	31.6 (26.5 to 37.1)
Never married	91	28.2 (23.3 to 33.6)
Number of children		
None	72	19.2 (15.3 to 23.9)
One or two	183	57.6 (52.0 to 63.1)
More than two	71	23.2 (18.7 to 28.3)
Currently in debt	170	54.7 (49.1 to 60.3)
Homeownership	125	36.9 (31.6 to 42.5)
Number of dependents		
None	43	11.3 (8.3 to 15.1)
Less than five	222	69.8 (64.4 to 74.6)
Five or more	61	19.0 (14.9 to 23.9)
Duration in Goa		
One year or less	43	11.8 (8.9-15.9)
2-10 years	99	30.0 (25.2-35.4)
More than 10 years	92	33.3 (28.1-39.1)
From birth	92	24.7 (20.3 to 29.7)
Travel out of Goa in the past year	185	57.4 (51.7-62.9)

Violence, autonomy and social support		
1. Violence		
Intimate partner verbal abuse (current)	108	29.7 (24.8 to 34.8)
Intimate partner physical abuse (current)	104	29.8 (25.0 to 35.1)
Any Intimate partner violence (current)	124	35.0 (29.9 to 40.50)
Violence from others (current)	69	18.8 (14.9 to 23.4)
Police raid (Past year)	50	14.0 (10.6 to 18.3)
*Lifetime sexual violence¹⁷	36	8.9 (6.4 to 12.3)
*Childhood sexual abuse	18	4.6 (2.8 to 7.3)
2. Autonomy		
Entrapment (forced to remain in sex-work against her will)	29	9.2 (6.4 to 13.2)
Autonomy in use of money	220	65.1 (59.5 to 70.5)
Politically empowerment (ever voted in elections)	170	55.1 (49.5 to 60.6)
*Coerced unsafe sex with customer	95 ¹⁸	29.7 (24.6 to 35.3)
3. Social support		
Recent lack of emotional support (Past week)	197	59.6 (54.0 to 65.1)
Intimate partner gives support	65	19.5 (15.4 to 24.2)
Family gives support	21	6.4 (4.2 to 9.8)
Other sex workers give support	114	35.1 (29.9 to 40.6)
Substance abuse and mental health		
Alcohol use		
Never	165	50.8 (45.1-56.4)
Less than weekly	23	6.1 (4.0-9.3)
At least weekly	138	43.1 (37.6- 48.8)
Suicide idea in the past 3 months	126	34.7 (29.6 to 40.1)
Suicide plan	95	25.4 (21.0 to 30.4)
Suicide attempt in past 3 months	73	18.7 (14.9 to 23.3)
Deliberate self harm (lifetime)	51	12.8 (9.7 to 16.8)

¹⁷ *Items were collected through the confidential ballot box

¹⁸ N= 295 and exclude women who did not answer yes or no to this question as they did not use condoms.

8.3.3 Working patterns and sexual risk

Table 8.2 shows the incredible diversity and dispersed nature of sex-work in Goa. Forty-four percent of sex workers in Goa were part-time, indirect sex workers. Sex workers engaged in street-based and home-based sex-work, as well as working from 50 different named lodges. Sex workers were dispersed, with more than one third of the women working in more than one establishment; 557 different lodges, establishments, areas and soliciting sites were named, including 57 in states other than Goa.

There were also marked variations in both the number and type of customer. Three quarters had entertained at least one customer in the previous week and 40% had regular paying customers. Median payment per customer was 100Rs (US\$2), however this encompassed a wide range from 10 rupees (US\$0.2) to 5,000 rupees (US\$200). Oral and anal sex were rarely reported; 7% (CI 5 to 10, n=30) and 5% (CI 3 to 8, n=21) respectively. The median age of entry into sex-work was 20 (interquartile range 17-26)

Three quarters had a regular non-paying intimate partner. Only 5% had changed this partner in the past month and 14% had a concurrent relationship with at least one other non-paying partner. One third of their intimate partners were day labourers, 16% worked as drivers of helpers, one in ten were either shopkeepers, in shipping and fishing, tourism, or skilled labour. The remainder were petty criminals (*goondas*), police, farmers and professionals.

8.3.4 Access to prevention technologies and health care:

A total of 74.4% (CI 69.3 to 78.9, n=237) of female sex workers stated that they consistently used condoms with customers, which was similar to the 71.3% (CI; 66.0-76.1, n=233) who reported condom use with their last customer in the secret ballot. In the confidential ballot, one in four of those who used condoms reported a breakage in the past three months, one in three reported being forced by a customer to have sex without condom, and one in seven reported accepting more money in exchange for sex without condoms. Less than 10% used condoms with their intimate non-paying partner. Only one in five reported having received condoms from a non-governmental organisation (NGO) or government. Eight women (2.6% CI 1.3-5.2, n=8) had ever used a female condom. Out of those who used condoms, 49.5% (CI 43.3- 55.6, n=132) used two or more condoms for additional protection.

One in five reported having attended an HIV prevention intervention delivered by a NGO or peer educator in the past three months, and a similar proportion had made changes to their behaviour because of HIV. The main sources of information for HIV were NGOs (32.5%), other sex workers (17.1%), and television (16.9%). Perhaps unsurprisingly, given poor literacy and low rates of school attendance, only 2.8% received information from newspapers and 1.6% from school. More than one third had little or no knowledge about how HIV was transmitted or prevented. More women perceived themselves at risk of HIV from their clients (58.6%), than regular male partners (25.4%) or someone they love (16.9%). Forty percent thought that HIV prevention interventions frightened clients away.

Table 8-2 Work and sexual risk of 326 female sex workers in Goa

Variable	Number ¹⁹ N=326	Weighted prevalence % (95% CI)
1. Sex work		
Time in sex work		
< 1 year	105	29.4 (24.7 to 34.7)
2-10 year	145	42.6 (37.2 to 48.2)
>10 year	76	28 (23 to 33.6)
Ever having worked in Baina red-light area	124	44.8 (39.2 to 50.6)
Income from other source than sex work	140	43.9 (38.4 to 49.6)
Street-based sex-work	77	22.7 (18.4 to 27.8)
Establishment (Bar, lodge, brothel) based sex-work	192	57.8 (52.1 to 63.2)
Home-based sex-work	89	28.0 (23.3 to 33.4)
More than one establishment/ site for sex-work	135	36.7 (31.6 to 42.2)
Start sex-work under age of 16	64	20.6 (16.3 to 25.8)
Number of customers in past week		
Less than one	123	37.1 (28.6 to 46.4)
One to seven	179	52.1 (44.5 to 59.6)
More than eight	24	22.8 (9.7 to 44.9)
At least one customer per day	208	62.6 (56.9 to 67.9)
At least one regular paying customers	140	40.2 (34.5 to 45.7)
2. Sexual risk		
Intimate non-paying male partner		
None	79	24.2 (19.7 to 29.4)
One	200	61.4 (55.8 to 66.8)
More than one	47	14.4 (10.9-18.7)
Place of residence of intimate partner²⁰		
Baina	61	28.7 (23.0 to 35.2)
Goa	128	50.3 (48.8 to 56.7)
Other state or country	58	21.0 (16.4 to 26.5)
Change in intimate partner (past 3 months)	19	5.4 (3.4 to 8.4)
Consistent condom use (with customers)	237	74.4 (69.3 to 78.9)
Consistent condoms use (with intimate partner)	28	8.6 (5.9 to 12.3)
Condom breakage (past three months²¹)	68	21.6 (17.1 to 26.9)
*Unsafe sex with customer²² (for financial award²³)	46	15.3 (11.5 to 20.0)

¹⁹ Weighted percentages calculated by including missing data²⁰ N= 247 that have intimate male partner²¹ N= 275, excluding women that did not answer this question (many had not used a condoms in the past three months)²² *Item form confidential ballot box

*Unsafe sex with customer²⁴ (coerced)	95	29.7 (24.6 to 35.3)
3. Exposure to HIV prevention and sexual/reproductive health		
Source of condom		
Customer bring	154	44.4 (38.9 to 50.0)
Buy	62	18.8 (14.9 to 23.5)
Free from NGO or government	59	21.1 (16.6 to 26.4)
Do not use condoms	51	15.8 (12.2 to 20.3)
Exposure to HIV prevention (lifetime)	111	38.7 (33.3 to 44.4)
Exposure to HIV prevention (past three months)	55	19.2 (15.0 to 24.3)
Make changes to behaviour because of HIV	65	18.3 (14.5 to 23.0)
HIV knowledge score		
0%	100	30.7 (25.8 to 36.1)
1-49%	43	12.0 (8.9 to 16.0)
>=50%	183	57.3 (51.7 to 62.8)
Lifetime HIV test	117	37.2 (31.9 to 42.9)
Lifetime pregnancy	295	91.5 (87.9 to 94.1)
*Lifetime induced abortion	91	25.2 (20.7 to 30.3)
Infertility (current)	47	14.8 (11.2-19.3)
Complaint of vaginal discharge (past three months)	87	24.0 (19.7 to 29.0)
Complaint of lower abdominal pain (past three months)	62	17.6 (13.8 to 22.3)
Complaint of genital ulcer disease (past three months)	24	6.7 (4.5 to 9.9)
Complaint of dysuria (past three months)	43	10.4 (7.6 to 14.0)
Any reproductive tract symptom (past three months)	153	43.9 (38.5 to 49.6)
Free STI treatment from government or non governmental clinic	15	3.9 (2.3 to 6.5)

Sixty-five (46.2% CI 37.9-54.7), sought care from a private practitioner for their STI symptoms, whilst seventy (44.5% CI 36.4-53.0) did not access any care at all. Two thirds chose health care based on the “*way they are treated by the provider*” and one-third because of “*cost*”.

²³ N= 291, excluding women that did not answer this question (some had never used condom)

²⁴ N= 295, exclude women that did not answer this question (most of whom never used a condom)

8.4 Determinants of HIV and STI

8.4.1 Factors associated with STI prior to adjustment

Demographic and psychosocial factors that were associated with STIs in univariate analysis (table 8.3) were age under 20 (OR 4.22; CI 1.92 to 9.30), Goan ethnicity (OR 2.20; CI 1.15 to 4.22), police raid over the past year (OR 2.25; CI 1.14 to 4.46), suicide ideation in the past 3 months (OR 2.25 CI 1.29 to 3.90), and deliberate self harm (OR 2.90; CI 1.46 to 5.75). After adjustment for other factors in the socio-demographic domain all the above factors except suicidal ideation in the past three month remained associated with STIs (table 8.7).

Table 8-3 Demographic and psychosocial factors associated with STI in 309 Goa based FSWs

Variable	n with STI/N total [weighted %]	Univariate odds ration for STI (95% CI)
Socio demographic		
Age, years		p 0.008
<20	17/33 [50.2]	1
21-25	20/96 [19.1]	0.23 (0.10 to 0.57)
26-30	18/75 [21.1]	0.26 (0.11 to 0.66)
31-35	5/40 [12.4]	0.14 (0.04 to 0.47)
>35	15/65 [21.6]	0.27 (0.11 to 0.70)
Ethnicity		p 0.02
Goan	19/53 [35.7]	1
Non Goan	56 /256 [20.1]	0.45 (0.24 to 0.87)
Religion		p 0.2
Non Hindu	30/100 [26.6]	1
Hindu	45/209 [20.1]	0.69 (0.40 to 1.21)
Literacy		0.7
Literate	16/67 [20.3]	1
Not fully literate	59/242 [22.3]	1.13 (0.58 to 2.20)
Schooling		p 0.9
None	45/187 [22.3]	1
Incomplete	28/112 [21.6]	0.96 (0.55 to 1.68)
Complete (12 th standard)	2/10 [16.5]	0.69 (0.14 to 3.43)

Marital status			p 0.1
Never Married	16/85 [15.6]	1	
Married	30/129 [21.5]	1.49 (0.72 to 3.06)	
Widowed/separated	29/95 [28.1]	2.12 (1.01 to 4.45)	
Debt			P 0.3
None	41 /147 [24.3]	1	
Currently in debt	34/162 [19.5]	0.73 (0.43 to 1.26)	
Home owner			P 0.07
No	37/119 [27.6]	1	
Yes	38 /190 [18.6]	0.60 (0.35 to 1.04)	
Number of dependents			P 0.7
None	11/40 [27.0]	1	
Less than five	51/211 [21.5]	0.74 (0.33 to 1.65)	
Five or more	13/58 [20.5]	0.70 (0.26 to 1.85)	
Duration in Goa			p 0.3
One year or less	16/40 [34.1]	1	
2-10 years	20/95 [20.4]	0.49 (0.22 to 1.13)	
More than 10 years	17/85 [18.8]	0.45 (0.19 to 1.05)	
From birth	22/89 [22.3]	0.55 (0.24 to 1.27)	
Travel out of Goa in the past year			p 0.1
No	37/133 [26.4]	1	
Yes	38/176 [18.7]	0.64 (0.38-1.06)	
Violence, autonomy and social support			
1. Violence			
Any intimate partner violence			p 0.16
No	24/127 [16.5]	1	
Yes	31/120 [23.7]	1.58 (0.84 to 2.96)	
Violence from others			p 0.8
No	60/243 [22.3]	1	
Yes	15/66 [20.6]	0.90 (0.45 to 1.78)	
Police raid over past year			p 0.02
No	57/260 [19.8]	1	
Yes	18/49 [35.5]	2.25 (1.14 to 4.46)	
2. Autonomy			
Entrapment			p 0.6
Able to leave SW	70/283 [22.4]	1	
Unable to leave SW	5/26 [17.5]	0.74 (0.25 to 2.14)	
Autonomy in use of money			p 0.08
Has financial autonomy	43/206 [19.0]	1	
No financial autonomy	32/103 [27.3]	1.61 (0.92 to 2.81)	
Political empowerment			P 0.2
Never voted in elections	34/161 [19.2]	1	
Ever voted in elections	41/148 [25.3]	1.42 (0.82 to 2.44)	
3. Social support			
Emotional support (Past week)			p 0.8
Yes	29/124 [21.3]	1	
No	46/185 [22.4]	1.07 (0.61 to 1.86)	
Intimate partner provide support			p 0.17
	10/61 [15.3]	0.58 (0.27 to 1.26)	

Family provide support		p 0.4
	7/20 [29.6]	1.54 (0.57 to 4.15)
Other sex workers provide support		p 0.9
	25/107 [22.3]	1.03 (0.58 to 1.83)
Substance abuse and mental health		
Alcohol use		p 0.5
Never	39/156 [22.8]	1
Less than weekly	8/23 [31.4]	1.54 (0.57 to 4.15)
At least weekly	28/130 [19.5]	0.82 (0.46 to 1.46)
Suicide idea in the past 3 months		p 0.004
No	35/191 [17.1]	1
Yes	40/117 [31.7]	2.25 (1.29 to 3.90)
Suicide plan past 3 months		p 0.08
No	47/221 [19.7]	1
Yes	28/187 [29.4]	1.67 (0.94 to 2.98)
Suicide attempt in past 3 months		p 0.2
No	54/240 [20.8]	1
Yes	21/68 [27.5]	1.45 (0.76 to 2.61)
Deliberate self harm (lifetime)		p 0.002
No	54/263 [19.3]	1
Yes	21/46 [41.0]	2.90 (1.46 to 5.75)
Mental health score	n/a	p 0.7
		0.99 (0.95 to 1.03)

Work and sexual behaviour factors associated with a reduced likelihood of finding a curable STI in univariate analysis (table 8.4) were ever having worked in Baina (OR 0.38 CI 0.20-0.71), having an intimate regular male partner (OR 0.44 CI 0.24-0.79), lifetime exposure to a NGO delivered HIV prevention intervention (OR 0.46 CI 0.25-0.87), higher HIV knowledge scores (OR 0.94 CI 0.91-0.98). Childhood sexual abuse (OR 4.12; CI 1.44-11.81), and street-based sex-work (OR 2.13 CI 1.76-3.86) were associated with a higher likelihood of finding a curable STI.

After adjustment for socio-demographic factors in the base model all the above factors remained associated with STIs. Lack of symptoms in the past three months was also found to be associated with STI (OR 2.36 CI 1.20 to 4.63).

Table 8-4 Work and sexual behaviour factors associated with STI in 309 FSWs in Goa

Variable	N with STI/N total [weighted %]	Univariate odds ratio for STIs (95% CI)
1. Sex work		
Time in sex work p 0.17		
< 1 year	70/102 [29.4]	1
2-10 year	34/136 [22.6]	0.77 (0.42 to 1.41)
>10 year	11/71 [14.9]	0.46 (0.21 to 1.03)
Association with Baina p 0.003		
Never worked in Baina red-light area	59/194 [28.7]	1
Ever worked in Baina red-light area	16/115 [13.3]	0.38 (0.20 to 0.71)
Income other than sex work p 0.3		
No other source of income	48/176 [25.3]	1
Other source of income	27/133 [18.9]	0.73 (0.42 to 1.27)
Street based sex work p 0.01		
No	51/236 [18.7]	1
Yes	24/73 [32.9]	2.13 (1.76 to 3.86)
Bar, Lodge, brothel-based sex work p 0.4		
No	32/129 [24.2]	1
Yes	43/180 [20.3]	0.80 (0.46 to 1.40)
Home based sex work p 0.4		
No	58/224 [23.3]	1
Yes	17/81 [18.5]	0.74 (0.40 to 1.41)
Number of establishments p 0.4		
One	40/179 [20.6]	1
More than one	35/129 [24.3]	1.23 (0.72 to 2.13)
Age starting sex work p 0.3		
Over the age of 16	57/248 [20.5]	1
Under the age of 16	17/59 [26.8]	1.43 (0.73 to 2.79)
Number of customers in past week p 0.06		
Less than one	20/115 [16.0]	1
One to seven	46/172 [24.4]	1.70 (0.93 to 3.12)
More than eight	9/22 [37.2]	3.12 (1.13 to 8.63)
Average no. of customers per day p 0.3		
Less than one customer per day	22/112 [18.9]	1
At least one customer per day	53/197 [23.8]	1.35 (0.75-2.93)
Number of regular customers p 0.07		
None	37/176 [18.4]	1
At least one regular paying customers	38/133 [27.2]	1.66 (0.96 to 2.86)
Payment per sex act (per 100 rupee sex act) p 0.4		
		1.02 (0.97 to 1.07)
2. Sexual risk		
Intimate non-paying male partner p 0.02		
None	28/75 [32.7]	1
One	40/187 [19.2]	0.47 (0.25 to 0.86)
More than one	7/47 [14.2]	0.33 (0.12 to 0.85)

Change in intimate male partner (past 3 months)		p 0.07
No	67/291 [20.9]	1
Yes	8/18 [40.7]	2.60 (0.94 to 7.14)
Condom use with customers		p 0.4
Inconsistent	22/84 [25.1]	1
Consistent	53/225 [20.9]	0.79 (0.43 to 1.42)
Condom use with intimate partner		p 0.7
Inconsistent	70/285 [22.2]	1
Consistent	5/24 [19.1]	0.83 (0.30 to 2.44)
*Condom breakage (past 3 month) ²⁵		p 0.4
No	21/67 [28.2]	1
Yes	43/193 [20.0]	0.63 (0.33 to 1.22)
Never use	11/49 [22.6]	0.74 (0.31 to 1.77)
*Unsafe sex with customer (financial award)		p 0.4
No	58/231 [21.9]	1
Yes	10/44 [22.8]	1.05 (0.45 to 2.32)
*Unsafe sex with customer (Coerced)		p 0.5
No	45/192 [20.7]	1
Yes	23/87 [24.4]	1.24 (0.67 to 2.27)
*Lifetime sexual violence		P 0.07
No	63/274 [20.7]	1
Yes	12/35 [34.8]	2.05 (0.93 to 4.51)
*Childhood sexual abuse		p 0.009
No	67/293 [20.6]	1
Yes	8/16 [51.8]	4.12 (1.44 to 11.81)
3. Exposure to HIV prevention and sexual health services		
Source of condom		p 0.3
Customer bring	38/146 [23.2]	1
Buy	18/66 [28.4]	1.30 (0.65 to 2.60)
Free from NGO or government	8/54 [12.8]	0.48 (0.20 to 1.16)
Do not use condoms	11/49 [22.9]	0.98 (0.45 to 2.13)
Exposure to HIV prevention (lifetime)		p 0.02
No	58/206 [26.6]	1
Yes	17/103 [14.4]	0.46 (0.25 to 0.87)
Exposure to HIV prevention (past three months)		p 0.2
No	66/256 [23.4]	1
Yes	9/52 [15.8]	0.61 (0.28 to 1.36)
Make changes to behaviour due to HIV		p 0.5
No	57/248 [21.2]	1
Yes	18/61 [25.3]	1.26 (0.65 to 2.41)
HIV knowledge score		p 0.002
		0.94 (0.91 to 0.98)

²⁵ *Item collected from the confidential ballot

Lifetime HIV test			p 0.05
No	54/119 [25.5]	1	
Yes	21/110 [15.8]	0.55 (0.30 to 1.00)	
Pregnancy			p 0.1
Never pregnant	65/279 [20.8]	1	
Ever pregnant	10/29 [34.7]	2.02 (0.86 to 4.75)	
*Lifetime induced abortion			p 0.5
No	23/84 [24.9]	1	
Yes	52/225 [21.0]	0.80 (0.44 to 1.46)	
Current infertility			p 0.5
No	66/263 [22.6]	1	
Yes	9/46 [18.3]	0.77 (0.34 to 1.73)	
Treatment from free STI clinic (public or NGO)			p 0.18
No	74/295 [22.6]	1	
Yes	1/14 [6.6]	0.24 (0.03 to 2.91)	
Complaint of vaginal discharge (past three months)			p 0.7
No	56/226 [22.4]	1	
Yes	19/83 [20.6]	0.90 (0.48 to 1.67)	
Complaint lower abdominal pain (past three months)			p 0.7
No	63/253 [22.4]	1	
Yes	12/56 [19.9]	0.86 (0.41 to 1.81)	
Complaint genital ulcer disease (past three months)			p 0.2
No	67/287 [21.2]	1	
Yes	8/22 [33.6]	1.81 (0.71 to 5.00)	
Complaint of dysuria (past three months)			p 0.9
No	65/270 [21.8]	1	
Yes	10/39 [23.0]	1.07 (0.48 to 2.39)	
Any reproductive tract symptom (past three months)			p 0.2
No	31/144 [18.7]	1	
Yes	44/165 [24.5]	1.41 (0.81 to 2.44)	

8.4.2 Factors associated with HIV prior to adjustment

Demographic and psychosocial factors found to be associated with HIV in univariate analysis (table 8.5) were being Hindu (OR 2.54, CI 1.33 to 4.86), being widowed or separated (OR 2.50, 1.32 to 4.73), migration to Goa since birth (OR 2.34, CI 1.11 to 4.64) and being involved in a police raid in the past year (OR 2.23, 1.14 to 4.39).

Factors associated with a lower likelihood of finding HIV were having social support (OR 0.52, CI 0.31 to 0.89) and turning to other sex workers for support (OR 0.54, CI 0.30 to 0.98).

Factors that remained associated with HIV after adjustment for other socio-demographic factors were being Hindu, being involved in a police raid, and lack of social support (table 8.8).

Table 8-5 Demographic and psychosocial factors associated with HIV in 325 FSWs from Goa

Variable	n with HIV/ N total [weighted %]	Univariate Odds ratio for HIV (95% CI)
Socio demographic		
Age, years		P 0.9
<20	5/34 [17.3]	1
21-25	25/100 [27.1]	1.78 (0.60 to 5.34)
26-30	18/79 [25.9]	1.70 (0.54 to 5.20)
31-35	11/43 [26.4]	1.72 (0.51 to 5.81)
>35	18/69 [26.5]	1.73 (0.56 to 5.39)
Ethnicity		P 0.2
Goan	9/53 [18.2]	1
Non Goan	68/272 [26.7]	1.63 (0.75 to 3.55)
Religion		P 0.004
Non Hindu	14/103 [14.5]	1
Hindu	63/222 [30.0]	2.54 (1.33 to 4.86)
Literacy		p 0.7
Literate	16/70 [27.7]	1
Not fully literate	61/255 [25.3]	0.89 (0.46 to 1.70)
Schooling		p 0.3
None	53/199 [27.9]	1
Incomplete	24/116 [22.7]	0.76 (0.43 to 1.34)
Complete (12 th standard)	0/10 [0]	n/a
Marital status		p 0.01
Married	22/134 [17.4]	1
Widowed/separated	69/ 32 [34.5]	2.5 (1.32 to 4.73)
Never married	23/90 [27.8]	1.83 (0.92 to 3.63)
Debt		p 0.6
No debt	39/155 [27.4]	1
Currently in debt	38/170 [24.4]	0.85 (0.50 to 1.45)

Home owner			p 0.3
Yes	23/124 [22.1]	1	
No	54/201 [27.9]	1.36 (0.77 to 2.41)	
Number of dependents			p 0.17
None	8/42 [21.5]	1	
Less than five	60/222 [28.9]	1.49 (0.63 to 3.50)	
Five or more	9/61 [16.6]	0.73 (0.25 to 2.15)	
Duration in Goa			p 0.03
One year or less	11/41 [32.2]	1	
2-10 years	23/99 [22.6]	0.61 (0.26 to 1.44)	
More than 10 years	30/ 94 [34.1]	1.09 (0.47 to 2.50)	
From birth	13/91 [15.0]	0.37 (0.15 to 0.95)	
Travel out of Goa in the past year			p 1
No	34/140 [25.8]	1	
Yes	43/ 185 [25.7]	1.00 (0.59 to 1.72)	
Violence, autonomy and social support			
1. Violence			
Any intimate partner violence			p 0.2
No	31/135 [24.6]	1	
Yes	21/124 [17.8]	0.67 (0.35 to 1.26)	
Violence from others			p 0.3
No	64/256 [26.9]	1	
Yes	13/69 [20.7]	0.72 (0.36 to 1.42)	
Police raid (Past year)			p 0.02
No	60/275 [23.3]	1	
Yes	17/50 [40.5]	2.23 (1.14 to 4.39)	
*Lifetime sexual violence²⁶			p 0.6
No	70/282 [26.7]	1	
Yes	7/36 [22.4]	0.79 (0.32 to 1.94)	
*Childhood sexual abuse			p 0.4
No	72/307 [25.3]	1	
Yes	5/18 [34.7]	1.57 (0.53 to 4.63)	
2. Autonomy			
Entrapment			p 0.4
Able to leave sex work	69/296 [25.0]	1	
Unable to leave sex work	8/29 [32.6]	1.45 (0.60 to 3.50)	
Autonomy in use of money			p 0.13
Has financial autonomy	46/219 [22.8]	1	
No financial autonomy	31/106 [31.2]	1.53 (0.89 to 2.65)	
Political empowerment			p 0.2
Ever voted in elections	40/170 [25.2]	1	
Never voted in elections	37/155 [26.4]	1.06 (0.63 to 1.80)	
3. Social support			
Recent emotional support			p 0.02
No social support in past week	39/129 [33.2]	1	
Has social support in past week	38/196 [20.6]	0.52 (0.31 to 0.89)	

²⁶ *Items with star collected through the confidential booth

Intimate partner provides support			p 0.4
No	60/260 [24.7]		1
Yes	17/65 [30.0]		1.31 (0.69 to 2.49)
Family provides support			p 0.5
No	71/303 [25.3]		1
Yes	6/22 [31.9]		1.38 (0.50 to 3.82)
Other sex workers provide support			p 0.04
No	58/211 [29.6]		1
Yes	19/114 [18.5]		0.54 (0.30 to 0.98)
Substance abuse and mental health			
Alcohol use			p 0.2
Never	34/164 [22.4]		1
Less than weekly	3/23 [17.0]		0.61 (0.18 to 2.76)
At least weekly	40/138 [30.9]		1.55 (0.90 to 2.68)
Suicide idea in the past 3 months			p 0.7
No	50/199 [26.6]		1
Yes	27/125 [24.3]		0.88 (0.51 to 1.54)
Suicide plan in the past 3 months			p 0.4
No	53/230 [24.6]		1
Yes	24/94 [29.2]		1.26 (0.71 to 2.25)
Suicide attempt in past 3 months			p 0.5
No	63/252 [26.6]		1
Yes	14/72 [22.2]		0.78 (0.40 to 1.53)
Deliberate self harm			p 0.16
No	62/274 [24.5]		1
Yes	15/50 [34.8]		1.65 (0.82 to 3.30)
Mental Health score			p 0.1
			1.03 (0.99 to 1.07)

Work and behavioural factors associated with HIV (table 8.6) in univariate analysis were more than one year duration in sex work (OR 2.82 CI 1.45 to 5.51), ever having worked in Baina (OR 2.83 CI 1.65 to 4.86), brothel and lodge-based sex work (OR 1.81 CI 1.03 to 3.17), daily customers (OR 2.52 CI 1.36 to 4.67), consistent condom use with customers (OR 3.24 CI 1.56 to 6.73), lifetime exposure to HIV prevention (OR 2.07 CI 1.21 to 3.55), life time HIV test (OR 1.79 (1.04 to 3.06), complaint of lower abdominal pain (OR 2.00 CI 1.06 to 3.77), genital ulcer disease (OR 3.28 (1.34 to 8.04), dysuria in the past three months (OR 2.75 CI 1.36 to 5.57), HSV-2 (OR 2.58 CI 1.43 to 4.65) and TPHA (OR 2.10 CI 1.19 to 3.71). Factors associated with lower likelihood of finding HIV are working in more than one establishment (OR 0.55 CI

0.31 to 0.97), US\$10 increase in payment for sexual act (OR 0.82 CI 0.68 to 0.98), and having a regular intimate partner (OR 0.53 (0.30 to 0.95).

After adjustment for socio-demographic factors the following factors remained associated with HIV, duration of sex work, ever having worked in Baina, brothel or lodge-based sex work, home-based sex work, consistent condom use with customers, HSV-2, genital ulcer disease and dysuria.

Table 8-6 Work and sexual behaviour factors associated with HIV in 325 FSWs in Goa

Variable	n with HIV/ N total [weighted %]	Univariate Odds ratio for HIV (95% CI)
1. Sex work		
Time in sex work		
< 1 year	13/104 [13.6]	1
2-10 year	39/145 [28.2]	2.50 (1.23 to 5.07)
>10 year	25/76 [34.7]	3.38 (1.56 to 7.31)
Association with Baina		
Never worked in Baina red-light area	32/200 [16.9]	1
Ever worked in Baina red-light area	45/125 [36.6]	2.83 (1.65 to 4.86)
Income other than sex work		
No other source of income	48/185 [28.6]	1
Other source of income	29/140 [22.1]	0.71 (0.41 to 1.22)
Street based sex work		
No	62/248 [27.3]	1
Yes	15/77 [20.4]	0.68 (0.36 to 1.30)
Bar, lodge, brothel based sex work		
No	24/133 [19.4]	1
Yes	53/192 [30.8]	1.81 (1.03 to 3.17)
Home based sex work		
No	61/237 [28.0]	1
Yes	16/88 [19.7]	0.63 (0.33 to 1.19)
Number of establishments		
One	54/190 [29.7]	1
More than one	23/134 [18.9]	0.55 (0.31 to 0.97)
Age start sex work		
Over the age of 16	61/260 [25.6]	1
Under the age of 16	16/63 [27.0]	1.08 (0.55 to 2.09)

Number of customers in past week		p 0.3
Less than one	26/123 [22.4]	1
One to seven	48/178 [29.0]	1.42 (0.81 to 2.49)
More than eight	3/24 [15.6]	0.64 (0.17 to 2.37)
Average no. of customers per day		p 0.003
Less than one customer per day	17/118 [15.6]	1
At least one customer per day	60/207 [31.8]	2.52 (1.36 to 4.67)
Number of regular customers		p 0.05
None	52/186 [29.8]	1
At least one regular paying customers	25/139 [19.7]	0.58 (0.33 to 1.01)
Payment per sex act (per 100 rupee sex act)		p 0.05 0.82 (0.68 to 0.98)
2. Sexual risk		
Intimate non-paying male partner		p 0.01
None	25/79 [34.5]	1
One	48/199 [25.8]	0.63 (0.35 to 1.15)
More than one	4/47 [8.7]	0.17 (0.05 to 0.55)
Change in intimate male partner (past 3 months)		p 0.6
No	73/306 [26.0]	1
Yes	4/19 [20.7]	0.74 (0.23 to 2.41)
Condom use with customers		p 0.002
Inconsistent	10/88 [11.9]	1
Consistent	67/237 [30.5]	3.24 (1.56 to 6.73)
Condom use with intimate partner		p 0.7
Inconsistent	70/297 [25.4]	1
Consistent	7/28 [28.9]	1.19 (0.47 to 3.01)
*Condom breakage²⁷ (past three months²⁸)		P 0.2
No	65/257 [27.2]	1
Yes	12/68 [19.2]	0.64 (0.31 to 1.30)
*Unsafe sex with customer (financial award²⁹)		P 1.0
No	63/244 [27.9]	1
Yes	11/46 [27.5]	0.98 (0.46 to 2.10)
*Unsafe sex with customer³⁰ (coerced)		P 0.4
No	54/200 [29.2]	1
Yes	21/94 [24.4]	0.78 (0.43 to 1.42)
3. Exposure to HIV prevention and sexual/reproductive health services		
Source of condom		p <0.001
Customer bring	22/153 [16.8]	1
Buy	27/62 [46.0]	4.21 (2.09 to 8.49)
Free from NGO or government	22/59 [36.6]	2.85 (1.38 to 5.86)
Do not use condoms	6/51 [12.0]	0.66 (0.25 to 1.80)

²⁷ *Items collected through confidential ballot

²⁸ N= 275, excluding women that did not use condoms

²⁹ N= 291, excluding women that did not answer this question because never use condoms

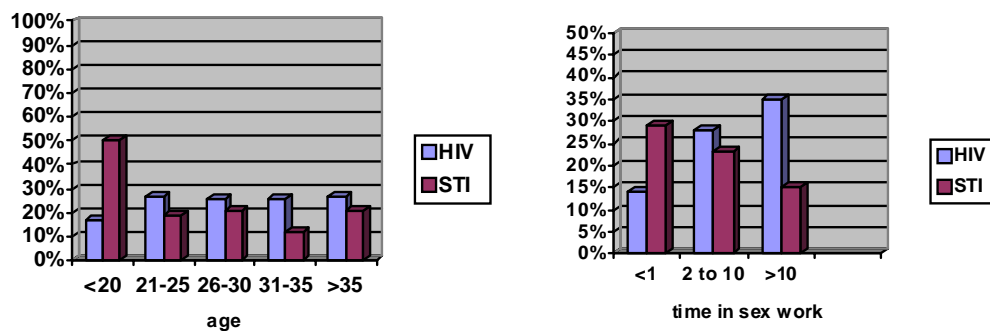
³⁰ N= 295, exclude women that did not answer this question as never use condoms

Exposure to HIV prevention (lifelong)		p 0.008
No	41/214 [20.2]	1
Yes	36/111 [34.4]	2.07 (1.21 to 3.55)
Exposure to HIV prevention (three months)		p 0.02
No	57/270 [22.6]	1
Yes	20/55 [38.9]	2.18 (1.15 to 4.15)
Make changes to behaviour because of HIV		p 0.6
No	62/260 [25.1]	1
Yes	15/65 [28.5]	1.19 (0.62 to 2.31)
HIV knowledge score		p 0.3 1.02 (0.98 to 1.06)
Lifetime HIV test		p 0.04
No	43/298 [21.5]	1
Yes	34/117 [32.8]	1.79 (1.04 to 3.06)
Lifetime pregnancy		p 0.3
No	73/295 [26.6]	1
Yes	4/29 [17.0]	0.57 (0.19 to 1.72)
*Lifetime induced abortion		p 0.9
No	22/91 [25.1]	1
Yes	55/234 [25.9]	1.04 (0.58 to 1.88)
Lifetime infertility		p 0.4
No	63/278 [24.7]	1
Yes	14/47 [31.4]	1.40 (0.69 to 2.82)
Seeks treatment from free STI clinic (public or NGO)		p 0.4
No	75/310 [26.1]	1
Yes	2/15 [16.1]	0.55 (0.12 to 2.60)
Complaint of vaginal discharge (past three months)		p 0.7
No	59/237 [26.3]	1
Yes	18/88 [24.0]	0.89 (0.48 to 1.64)
Complaint of lower abdominal pain (past three months)		p 0.03
No	57/263 [23.2]	1
Yes	20/62 [37.7]	2.00 (1.06 to 3.77)
Complaint of genital ulcer disease (past three months)		p 0.009
No	67/301 [23.9]	1
Yes	10/24 [50.8]	3.28 (1.34 to 8.04)
Complaint of dysuria (past three months)		p 0.005
No	61/283 [23.4]	1
Yes	16/42 [45.7]	2.75 (1.36 to 5.57)

No reproductive tract symptom (three months)		p 0.1
No	40/157 [30.6]	1
Yes	37/173 [21.9]	0.64 (0.38 to 1.09)
HSV-2		p 0.002
No	20/139 [16.0]	1
Yes	56/181 [33.1]	2.58 (1.43-4.65)
Any curable STI		p 0.8
No	53/234 [24.2]	1
Yes	17/75 [25.9]	1.10 (0.58-2.08)
TPHA		p 0.01
No	48/241 [21.3]	1
Yes	29/84 [36.3]	2.10 (1.19 -3.71)

8.4.3 Factors associated with STI and HIV after adjustment for socio-demographic factors and final model

Figure 8-1 HIV and STI prevalence segregated by age and time in sex work for FSWs in Goa



The diagrammatic representation of the prevalence of curable STIs and HIV by age shows that women under the age of 20 had a high prevalence of bacterial STIs suggesting high risk sexual behaviour. The prevalence of HIV on the other hand seemed to rapidly rise to a plateau level by the time the female sex workers reached the age of twenty. Similarly the prevalence of STIs, and thus higher risk sexual behaviour, was highest in those who had recently started sex-work with the prevalence of HIV, on the other hand, rising with duration in sex-work.

The final model shows that after simultaneous adjustment for the factors from the base model and the factors from other domains ($p < 0.2$), the factors that remained independently associated with prevalent curable sexually transmitted infections (table 8.7) were youth, Goan ethnicity, poor school attendance, lack of financial autonomy, deliberate self harm, childhood sexual abuse, working on the streets, and having regular customers. Having a regular intimate male partner, greater knowledge about HIV transmission and prevention, and seeking treatment from free and dedicated STI services were associated with lower likelihood of having a STI. Women found to have bacterial STIs were less likely to report reproductive tract symptoms. There were no significant interactions between indicators in the final model.

Table 8-7 Factors associated with Sexually Transmitted Infections in 309 FSWs in Goa

Variable ³¹	Adjusted odds ratio ³² (95%CI) Adjusted for base model	Adjusted odds ratio ³³ (95% CI) Final model
I Demographic and psychosocial factors from baseline model		
Age, years	p 0.005	p<0.001
<20	1	1
21-25	0.18 (0.07 to 0.50)	0.13 (0.04 to 0.40)
26-30	0.23 (0.08 to 0.63)	0.14 (0.05 to 0.41)
31-35	0.12 (0.04 to 0.42)	0.05 (0.01 to 0.19)
>36	0.20 (0.07 to 0.57)	0.07 (0.02 to 0.23)
Non-Goan ethnicity	p 0.03 0.39 (0.17-0.91)	p 0.003 0.23 (0.08 to 0.61)
Schooling	p 0.03	p 0.007
None	1	1
Incomplete	0.50 (0.23 to 1.09)	0.33 (0.14 to 0.80)
Complete	0.07 (0.01 to 0.53)	0.06 (0.01 to 0.40)
Home owner	p 0.16 0.41 (0.34 to 1.19)	p 0.1 0.58 (0.30 to 1.14)
No financial autonomy	p 0.09 1.70 (0.93 to 3.13)	p 0.004 2.62 (1.36 to 5.04)
Police raid (Since demolition)	p 0.04 2.31 (1.03 to 5.19)	P 0.21 1.61 (0.75 to 3.46)
Deliberate self harm	p 0.009 2.88 (1.31 to 6.34)	p 0.002 3.73 (1.63 to 8.56)
II Sex work, sexual risk and reproductive health		
Having an intimate non-paying male partner	p 0.02 0.46 (0.24 to 0.89)	p 0.02 0.43 (0.21 to 0.88)
Change in intimate partner over the past three months	p 0.16 1.97 (0.77 to 5.02)	
Time in sex work	p 0.25	
< 1 year	1	
2-10 years	0.79 (0.40 to 1.57)	
>10 years	0.45 (0.18 to 1.16)	
Income from source other than sex work	p 0.5 0.81 (0.44 to 1.49)	
Street based sex work	p < 0.001 3.35 (1.72 to 6.52)	p 0.006 2.96 (1.37 to 6.38)
Lodge/ bar or brothel based sex work	p 0.15 0.62 (0.33 to 1.19)	

³¹ Only variables that were entered into the final model are listed in table 8.7 and 8.8. There are therefore differences in the variables in these two tables

³² Adjusted for underlying factors from base model i.e. age, ethnicity, schooling, home ownership, autonomy in the use of money, police raid and deliberate self-harm.

³³ Weighted adjusted odds ratio of the final model reported here.

Home based sex work	p 0.34 0.70 (0.34 to 1.46)	
Number of customers/week	p 0.12	p 0.21
Less than one	1	1
One to seven	1.35 (0.71 to 2.58)	1.58 (0.77 to 3.23)
More than seven	3.11 (1.05 to 9.20)	3.22 (0.79 to 13.21)
At least one regular paying customers	p 0.05 1.85 (1.00 to 3.41)	p 0.007 2.46 (1.28 to 4.73)
Consistent condom use with customers	p 0.5 0.78 (0.41 to 1.51)	
Payment per sex act with customer (per 100 rupees rise)	p 0.7 1.02 (0.94 to 1.10)	
*Childhood sexual abuse³⁴	p 0.02 3.35 (1.22 to 9.17)	p 0.01 3.79 (1.37 to 10.45)
*Lifetime experience of non-consensual/forced sex	p 0.6 1.59 (0.25 to 9.96)	
HIV knowledge score	p <0.001 0.92 (0.89 to 0.96)	0.01 0.94 (0.90 to 0.98)
Exposure to HIV prevention (lifetime)	p 0.004 0.38 (0.19 to 0.73)	
Seeks treatment in free STI clinic (Public & non governmental)	p 0.08 0.10 (0.01 to 1.35)	p 0.02 0.13 (0.02 to 0.71)
No reproductive tract symptoms (three months)	p 0.01 2.36 (1.20 to 4.63)	p 0.005 2.99 (1.40 to 6.42)

The final model shows that after simultaneous adjustment for the factors from the base model and the factors from other domains ($p < 0.2$), the factors that remained independently associated with HIV (table 8.8) are being Hindu, recent arrival in Goa, brothel and lodge-based sex-work, and the complaint of dysuria in the past three months. Those with HIV infection were more likely to have social support in the past week and less likely to have a current intimate non-paying male partner. There were no significant interactions between indicators in the final model.

³⁴ *Items collected through confidential ballot

Table 8-8 Factors associated with HIV in 325 female sex workers in Goa

Variable ³⁵	Adjusted Odds ratio ³⁶ Adjusted for base model (95% CI)	Adjusted OR ³⁷ Final model (95% CI)
I Demographic and psychosocial factors from base model		
Age, years	p 0.8	P 1
<20	1	1
21-25	1.60 (0.47 to 5.47)	0.90 (0.21 to 3.85)
26-30	1.84 (0.50 to 6.74)	0.92 (0.21 to 4.10)
31-35	1.95 (0.48 to 8.03)	0.81 (0.14 to 4.62)
>36	2.13 (0.57 to 7.93)	1.18 (0.24 to 5.76)
Religion	p 0.001	P 0.002
Hindu	2.94 (1.54 to 5.62)	3.31 (1.53 to 7.13)
Number of dependents	p 0.06	P 0.06
None	1	1
Less than five	1.32 (0.51 to 3.38)	1.71 (0.62 to 4.73)
Five or more	0.51 (0.16 to 1.61)	0.62 (0.18 to 2.25)
Duration in Goa	p 0.09	P 0.03
One year or less	1	1
2-10 years	0.46 (0.19 to 1.13)	0.27 (0.09 to 0.85)
More than 10 years	0.66 (0.27 to 1.61)	0.33 (0.11 to 0.99)
Since birth	0.32 (0.11 to 0.92)	0.21 (0.07 to 0.66)
Lack of social support (Past week)	p 0.02 0.49 (0.27 to 0.94)	P 0.04 0.50 (0.26 to 0.95)
Police raid (Since demolition)	p 0.006 3.03 (1.39 to 6.63)	P 0.08 2.17 (0.92 to 5.11)
Deliberate self harm (Lifetime)	p 0.07 2.15 (0.93 to 4.98)	P 0.3 1.66 (0.57 to 4.82)
II Sex work, sexual risk and reproductive health		
Having an intimate non-paying male partner	p 0.09 0.56 (0.29-1.10)	P 0.04 0.47 (0.22-0.97)
Duration in sex work	p 0.03	P 0.07
<1 year	1	1
2-10 years	2.80 (1.27-6.15)	2.56 (1.14-5.75)
> 10 years	2.72 (1.08-6.87)	2.19 (0.88-5.47)
Income from source other than sex work	p 0.7 0.83 (0.48-1.61)	
Street based sex work	p 0.4 0.74 (0.35-1.55)	
Lodge, bar brothel based sex work	p 0.02 2.04 (1.12-3.73)	P 0.04 2.01 (1.02-3.95)

³⁵ Only variables that were entered into the final model are listed in table 8.7 and 8.8. There are therefore difference in the variables in these two tables

³⁶ Adjusted to demographic and psychosocial factors i.e. age, religion, number of dependents, migrant status, social support, experience of a police raid in the past year, and deliberate self harm

³⁷ Weighted adjusted odds ratio of the final model reported here.

Home based sex work	p 0.03 0.46 (0.23-0.92)	
More than one establishment/ site for sex work	p 0.1 0.57 (0.29-1.11)	p 0.08 0.51 (0.24-1.09)
Number of customers/week	p 0.4	
Less than one	1	
One to seven	1.26 (0.69-2.19)	
More than seven	0.45 (0.09-2.19)	
At least one regular customers	p 0.1 0.63 (0.35-1.14)	
Consistent condom use with customer³⁸	P 0.003 3.04 (1.45-6.31)	
Payment per sex act with customer (per 100 rupee increase)	p 0.08 0.85 (0.71-1.02)	p 0.1 0.81 (0.62-1.06)
HIV knowledge score	p 0.3 1.02 (0.98-1.06)	
Exposure to HIV prevention (lifetime)	p 0.04 1.89 (1.03-3.46)	
Lifetime HIV test	p 0.16 1.53 (0.84-2.76)	
HSV-2	p 0.02 2.05 (1.10-3.82)	
Any curable STI	p 0.8 0.93 (0.46-1.89)	
Genital ulcer disease (Three months)	p 0.01 3.21 (1.24-8.32)	p 0.08 2.60 (0.88-7.64)
Dysuria (Three months)	p 0.001 3.95 (1.74-8.95)	p 0.002 5.58 (1.92-16.17)

³⁸ Consistent condom use adjusted for the other factors in the model is 1.93 (0.80-4.65) p 0.15

8.5 Comparing FSWs who ever worked in the red-light area with those that never worked in the red-light area

Of the 326 female sex workers recruited 125 [44.8% (CI; 39.1 to 50.5)] had ever worked in Baina and 201 [55.3% (CI; 49.5 to 60.9)] had never worked in Baina. 96 [47.9% (CI; 40.9 to 55.0)] of the non-Baina sex workers had started sex work since the demolition.

Table 8.9 compares the characteristics of female sex workers who had ever worked in Baina to those who never worked in Baina. Female sex workers who had ever worked in Baina were more likely to be of non-Goan ethnicity and have migrated to Goa from another State. They were less likely to experience gender-based violence and report suicide attempts, but more likely to be economically disadvantaged than their non-Baina counterparts. Ex-Baina sex workers on the other hand were more likely to be Hindu, and never married.

Table 8-9 Characteristics associated with ever compared with never having worked in the Baina red-light area

Variable	Non Baina FSW N [weighted % (95% CI)]³⁹	Ex- Baina FSW N [weighted % (95% CI)]	P value
Total number	201 [55.3 (49.5 to 60.9)]	125 [44.7 (39.1 to 50.5)]	
Age over 25	117 [60.5 (53.3 to 67.2)]	74 [64.6 (55.9 to 72.5)]	0.5
Non-Goan ethnicity	150 [81.1 (75.6 to 85.6)]	122 [98.3 (94.9 to 99.5)]	<0.001
Religion			
Hindu	122 [63.2 (56.1 to 69.7)]	101 [84.5 (77.5 to 89.5)]	
Christian	30 [12.6 (8.8 to 17.7)]	11 [7.0 (3.8 to 12.3)]	0.005
Muslim	47 [24.2 (18.6 to 31.0)]	13 [8.6 (5.0 to 14.5)]	
Not fully literate	150 [78.8 (72.7 to 83.8)]	105 [85.8 (78.7 to 90.8)]	0.1
Marital status			
Married	108 [58.5 (51.4 to 65.2)]	26 [17.6 (12.1 to 25.0)]	
Widowed / separated	56 [27.4 (21.5 to 34.1)]	45 [36.6 (28.4 to 45.7)]	<0.001
Never married	37 [14.1 (10.2 to 19.3)]	54 [45.8 (36.9 to 54.8)]	
Migrated to Goa (Since birth)	131 [69.8 (63.2 to 75.6)]	103 [82.0 (73.9 to 88.0)]	0.02
Support dependents	167 [84.8 (79.2 to 89.1)]	116 [93.6 (87.9 to 96.7)]	0.02
Debt	90 [46.4 (39.4 to 53.6)]	80 [65.0 (56.1 to 73.0)]	0.002
Entrapment (Not free to leave SW)	18 [8.7 (5.5 to 13.6)]	11 [9.9 (5.5 to 17.1)]	0.7
Autonomy (In use of money)	150 [74.9 (68.2 to 80.6)]	70 [53.1 (44.1 to 62)]	<0.001
Political empowerment	91 [45.6 (38.7 to 52.8)]	79 [66.8 (58.1 to 74.5)]	<0.001
Violent regular male partner	97 [45.6 (40.5 to 54.7)]	27 [19.5 (13.5 to 27.4)]	<0.001

³⁹ 95% CI = 95% confidence interval

*Lifetime sexual violence⁴⁰	31 [13.3 (9.4 to 18.7)]	5 [3.4 (1.4 to 8.2)]	0.004
Police raid in past year	32 [14.4 (10.2 to 19.9)]	18 [13.5 (8.5 to 20.8)]	0.8
No emotional support past week	138 [69.6 (62.7 to 75.7)]	59 [47.4 (38.5 to 56.4)]	0.001
Suicidal attempt (Past 3months)	59 [25.5 (20.0 to 32.0)]	14 [10.3 (6.1 to 16.9)]	<0.001

The sex workers who had never worked in Baina were much more likely to have started sex work in the year since the demolition (table 8.10). Nearly half of non-Baina sex workers compared with 7% of ex-Baina sex workers had started sex work since the demolition. Non-Baina sex workers were more likely to be part-time, street-based and home-based sex workers. In contrast more than 80% of ex-Baina sex workers were brothel or lodge based. Non-Baina sex workers were more likely to work in more than one place, have fewer customers and those that they have are more likely to be regular customers. Finally one third of ex-Baina sex workers compared with 10% of non-Baina sex workers had started sex-work before the age of 16, possibly reflecting the higher proportion of *devadasi* sex workers amongst the former.

⁴⁰ *Items collected through confidential ballot

Table 8-10 Sex work related factors associated with ever compared with never having worked in the Baina red-light area.

Variable	Non Baina FSW N [weighted % (95% CI)]	Ex- Baina FSW N [weighted % (95% CI)]	P value
Duration SW			
Less than one year	96 [47.9 (40.9 to 55.0)]	9 [6.8 (3.5 to 12.8)]	
One to ten years	86 [42.2 (35.4 to 49.4)]	59 [42.9 (34.4 to 51.9)]	<0.001
More than ten years	19 [9.9 (6.3 to 15.1)]	57 [50.2 (41.3 to 59.2)]	
Source of income other than sex work			
Street based sex work	72 [28.5 (31.7 to 45.7)]	5 [3.2 (1.3 to 7.7)]	<0.001
Home based sex work	69 [36.4 (29.7-43.5)]	20 [17.7 (11.7 to 25.9)]	<0.001
Lodge bar, brothel based sex work	88 [38.7 (32.1 to 45.6)]	104 [81.3 (73.0 to 87.5)]	<0.001
Start sex-work (under 16 years old)	23 [9.8 (6.4 to 14.8)]	41 [34.0 (26.0 to 43.1)]	<0.001
Daily clients (At least one client per day)	114 [55.1 (47.9 to 62.1)]	94 [71.9 (62.9 to 79.5)]	0.004
At least one regular customer	102 [50.1 (43.0 to 57.2)]	38 [28.1 (20.8 to 36.7)]	<0.001
Work in more than one establishment/ place	101 [70.3 (61.3 to 78.0)]	34 [29.7 (22.0 to 38.8)]	<0.001

After adjustment for potential confounding factors such as, age, ethnicity, religion, marital status, travel in the past year, duration in sex work, number of regular and non regular customers, having a regular intimate male partner, socio-economic indicators (debt, home ownership and number of dependents, and measures of autonomy (in use of money, political empowerment and entrapment), and alcohol use, ex-Baina-sex workers were three times less likely to have curable STIs, 20 times more likely to have had exposure to HIV prevention and 100 times more likely report consistent use of condoms with clients (table 8.11).. After further adjustment for behavioural factors

potentially on the explanatory pathway, i.e. condom use with paying and non-paying male partners and exposure to HIV prevention interventions, ex-Baina-SWs were still less likely to have a bacterial STI, adjusted OR 0.30 (0.19-0.94).

Table 8-11 HIV, STIs and sexual behaviour outcomes independently associated with FSWs who have ever worked in Goa's red-light area Baina compared to those who never worked in Baina.

Variable	Non-Baina – SW Weighted% (95% CI)	Baina-SW Weighted % (95% CI)	Odds Ratio (95% CI)	P Value	Adjusted OR ⁴¹ (95% CI)	P Value
HIV	16.9 (12.1 to 23.1)	36.6 (28.4 to 45.4)	2.83 (1.65 to 4.86)	<0.001	1.95 (0.85 to 4.56)	0.1
STI presence (Chlamydia, gonorrhoea or trichomonas)	26.3 (20.4 to 31.2)	13.3 (8.2 to 20.9)	0.43 (0.23 to 0.94)	0.03	0.27 (0.10 to 0.73)	0.01
Trichomonas	14.1 (9.8 to 19.8)	2.5 (0.8 to 7.6)	0.16 (0.04 to 0.57)	0.004	0.33 (0.13 to 0.87)	0.03
Always use condoms with clients	54.1 (46.9 to 61.1)	99.2 (94.8 to 99.9)	110.9 (15 to 818.8)	<0.001	105 ⁴² (7 to 1497)	0.001
Ever having an HIV session from an NGO	10.0 (96.6 to 15.1)	74.1 (65.7 to 81)	13.3 (6.1 to 29.2)	<0.001	21.2 (7.3 to 60.9)	<0.001

⁴¹ After adjusting for age, ethnicity, religion, marital status travel in the past year, duration in sex work, number of regular and non regular customers, having a regular non-paying male sexual partner, socioeconomic indicators (debt, home ownership and number of dependents) and measures of autonomy (in use of money, political empowerment and entrapment).

⁴² In addition to above factors adjusted for alcohol use

Although the prevalence of HIV in ex-Baina-SWs was 36.6% compared to 16.9% in non-Baina-SWs, after adjustment for potential confounding factors such as, age, ethnicity, religion, marital status, travel in the past year, duration in sex work, number of regular and non regular customers, having a regular intimate male partner, socio-economic indicators (debt, home ownership and number of dependents, and measures of autonomy (in use of money, political empowerment and entrapment) ex-Baina-sex workers were no more likely to have prevalent HIV than non-Baina sex workers (adjusted OR 1.95 (0.85-4.56). By looking at the relative effect of each of the potential confounding factors in building the multivariate model, it became apparent that three factors exerted the greatest effect: duration in sex work, number of clients and having a regular client.

8.6 Summary points

- A heterogeneous and dispersed sex work emerged from the demolition
- Female sex workers in Goa are a vulnerable core group, with high levels of bacterial STIs and HIV
- Societal factors and in particular gender disadvantage were associated with greater sexual risk
- Female sex workers that access free and dedicated STI services and HIV prevention are less likely to have bacterial STIs
- Young, recently initiated, dispersed street and home-based sex workers were more likely to be engaged in higher risk sexual activity

8.7 Conclusion

Following the demolition of the red-light area, sex workers in Goa have become a dispersed and heterogeneous group, with high levels of treatable bacterial STIs and HIV, and limited access to services. Given that those who accessed free sexual health services and had good HIV knowledge were at lower risk of bacterial STIs it is paramount that successful interventions are rapidly scaled up. Tackling structural determinants of sexual risk, including both underlying societal factors and more proximal factors relating to working conditions, is integral to HIV prevention. Women under the age of 20 and recent entrants to sex-work are particularly vulnerable to higher risk sexual behaviour and interventions targeting this group are urgently needed to prevent them from becoming infected with HIV early in their life as a sex worker.

9 Suicidal behaviour amongst the female sex workers in Goa, India

9.1 Introduction

In the previous chapters we have described the organisation of sex-work, the epidemiology of viral and bacterial STIs and HIV amongst sex workers, and the risk environment within which sex-work takes place in Goa. In this chapter we will explore suicidal behaviour and its determinants amongst the female sex workers who participated in the survey.

Suicide amongst young women is a public health priority in India. Rates of suicide are five-fold higher than in the developed world (Aaron et al. 2004; Eddleston & Konradsen 2007) with particularly high rates of suicide in young women (Maselko & Patel 2008; Pillai et al 2008; Vijayakumar et al. 2005). Female sex workers (FSWS) in India are a traditionally stigmatised group, with high prevalence of HIV, and levels of stigma and violence that relate to the context of their work (Blanchard et al. 2005; Chandrasekaran et al. 2006). Yet, there is virtually no information on suicide and its determinants in female sex workers from low and middle-income countries (Hong & Li 2007).

Many of the structural factors that determine sexual health risk are also implicated in suicidal behaviours. For example, gender-disadvantage, including gender based violence, lack of autonomy, child marriage, limited sexual choices, poor reproductive health, and social isolation, are seen as important contributing factors to the high rates of suicide seen

in women in Asia (Aaron et al 2004; Phillips et al. 2002a; Phillips et al 2002b; Vijayakumar et al 2005). In addition to potential relationship between the aetiology of suicidal behaviours and sexual risk behaviours, self-harming behaviours could themselves adversely impact upon female sex workers acceptance and participation in HIV care and prevention programmes and thus programme equity and outcomes. Therefore understanding the epidemiology of suicidal behaviours in female sex workers is not only important in order to guide health care planning, but may also inform the implementation of behavioural interventions and HIV treatment programmes. It is for this reason that I include these findings in this thesis.

The hypothesis that I will explore in this chapter is that, gender-disadvantage; sex-work, and health factors; together with factors indicative of social disadvantage are distal determinants of female sex workers vulnerability to suicidal behaviours (Hong et al. 2007; Maselko & Patel 2008; Patel et al. 2006; Pillai et al 2008), the effects of which would be mediated through poor mental health (Vijayakumar et al 2005).

In this chapter I describe the burden of suicidal behaviours in the cross-sectional sample of female sex workers described in the previous chapter. I explore the association of socio-demographic factors, type of sex-work, sexual health, and gender disadvantage, with and without measures of poor mental health, on suicide attempts in the past three months.

9.2 Mental health and self harming behaviours

Suicidal and self harming behaviours were common amongst the female sex workers. The prevalence of suicidal ideation in the previous 3 months was 34.9% (CI 29.8 to 40.3, n=126), suicide plan 25.6% (CI 21.1 to 30.6, n=95), and suicidal attempt 18.7% (CI; 14.9 to 23.3, n=73). The prevalence of suicide attempts in the past three months in women under the age of twenty was 41.5% (n=17). The prevalence of deliberate self harm was 12.8 % (CI 9.7-16.8, n=51); this frequently took the form of cutting the forearms to relieve feeling pain and distress. Twelve percent [12.3 (CI 11.4 to 13.2)] had severe mental disorder according to their k10 score. Just over half of the women used alcohol regularly and 45% reported regularly chewing tobacco (*gutka*). Less than 10% smoked tobacco and there were no reports of using narcotics or psychotropic substances.

9.3 Determinants of suicidal behaviour

Several socio-demographic factors, such as age, ethnicity, attending school, number of children, and duration in Goa were associated with suicide attempt in the past three months (Table 9.1). After adjustment for other socioeconomic factors, the following factors were independently associated with lower suicide risk: being of Karnataka (migrant) ethnicity compared with Goan (^{adj}OR 0.26; CI 0.11 to 0.62); and having at least one child (^{adj}OR 0.36; CI 0.17 to 0.75). Age, ethnicity, religion and number of children remained in the model.

Table 9-1 Association between socio-demographic factors and suicide attempt in a cross sectional survey of 325 FSWs in Goa

Factor	Number & weighted % of the sample No (wt %)	Prevalence of suicide attempts 3m. No (wt %)	Univariate OR (95% CI)	Adjusted Odds ratio (95% CI) Base model
All	325 (100%)	73 (18.7)		
Age, years			p 0.01	p 0.4
<20	35 (8.6)	17 (41.5)	1	1
21-25	100 (29.0)	22 (18.5)	0.32 (0.13 to 0.76)	0.44 (0.17 to 1.15)
26-30	78 (25.5)	11 (10.8)	0.17 (0.07 to 0.45)	0.29 (0.10 to 0.86)
31-35	43 (13.8)	10 (21.1)	0.38 (0.14 to 1.04)	0.75 (0.23 to 2.51)
>=36	69 (22.9)	13 (17.7)	0.30 (0.12 to 0.77)	0.63 (0.20 to 2.05)
Ethnicity			p <0.001	p 0.004
Goan	54 (11.2)	23 (39.7)	1	1
Karnataka	200 (72.0)	28 (13.3)	0.23 (0.12 to 0.46)	0.26 (0.11 to 0.62)
Other	71 (16.8)	22 (28.2)	0.60 (0.28 to 1.27)	0.62 (0.25 to 1.57)
Religion			p 0.01	p 0.2
Non Hindu	102 (27.5)	41 (27.4)	1	1
Hindu	223 (72.6)	32 (15.5)	0.48 (0.28 to 0.85)	0.66 (0.34 to 1.26)
Literacy			p 0.12	
Literate	71 (18.1)	21 (25.4)	1	
Not fully literate	254 (81.9)	52 (17.3)	0.61 (0.33 to 1.14)	
Schooling			p 0.01	
None	252 (67.3)	33 (15.1)	1	
Any	73 (32.7)	40 (26.3)	2.01 (1.16 to 3.48)	
Marital status			p 0.5	
Never married	91 (28.4)	24 (20.2)	1	
Married	134 (40.3)	30 (20.5)	1.02 (0.53 to 1.95)	
Separated / widowed	101 (31.3)	19 (15.2)	0.70 (0.35 to 2.00)	
In debt			P 0.5	
No	156 (45.4)	39 (20.3)	1	
Yes	169 (54.6)	34 (17.4)	0.83 (0.48 to 1.43)	
Home ownership			0.16	
Yes	124 (36.8)	35 (22.7)	1	
No	201 (63.2)	38 (16.5)	0.67 (0.39 to 1.17)	
Dependents			p 0.09	
No	43 (11.3)	29 (28.9)	1	
Yes	282 (88.7)	14 (17.5)	0.52 (0.25 to 1.09)	
No. of children			p < 0.001	p 0.006
None	72 (19.3)	30 (37.6)	1	1
One or more	254 (80.7)	43 (14.2)	0.28 (0.15 to 0.50)	0.36 (0.17 to 0.75)

Duration in Goa				P 0.01
One year or less	42 (11.6)	16 (31.1)	1	
2-10 years	99 (30.1)	14 (13.5)	0.35 (0.15 to 0.83)	
More than 10 years	92 (33.5)	13 (12.9)	0.33 (0.14 to 0.80)	
From birth	92 (24.8)	30 (27.2)	0.83 (0.37 to 1.83)	

Table 9.2 describes the association between sex-work factors and suicide attempts in the past three months after adjusting for socioeconomic factors. Ever having worked in the Baina red-light area was associated with a lower likelihood of suicide attempts. Having more and regular customers were associated with greater likelihood of suicide attempts.

Domain specific multivariate analysis showed that after adjusting for socioeconomic factors and other sex-work factors, having regular customers, ^{adj}OR 2.55 (1.34 to 4.85) and having worked in the Baina red-light area, ^{adj}OR 0.42 (0.18 to 1.00) were associated with suicide attempt.

Table 9-2 Association between sex work factors and suicide attempt in a cross sectional survey of 325 FSWs in Goa

Variable	Number & weighted % of the sample No (wt %)	Prevalence of suicide attempts 3m No (wt %)	Adjusted OR (95% CI) ⁴³
Time in sex work			p 0.13
< 1 year	105 (29.6)	28 (22.8)	1
2-10 years	144 (42.4)	37 (21.9)	1.02 (0.50 to 2.08)
>10 years	76 (28.0)	8 (9.6)	0.43 (0.16 to 1.11)
Having ever worked in the Baina red-light area	124 (44.6)	14 (10.3)	p 0.01 0.37 (0.16 to 0.84)
Income from source other than sex work	140 (44.1)	30 (18.7)	p 0.69 1.29 (0.67 to 2.48)
Street based sex work	77 (22.8)	15 (17.9)	p 0.7 1.13 (0.53 to 2.39)
Lodge bar or brothel based sex work	191 (57.6)	46 (19.8)	p 0.7 0.86 (0.41 to 1.81)
Home based sex work	89 (28.1)	21 (19.9)	p 0.4 1.38 (0.67 to 2.84)
Number of customers/week			p 0.03
Less than one	123 (38.4)	20 (13.1)	1
One to seven	179 (56.4)	43 (20.5)	1.84 (0.96 to 3.51)
More than seven	23 (5.2)	10 (41.5)	4.27 (1.30 to 14.07)
One or more regular customer	139 (40.1)	47 (29.5)	p 0.001 2.93 (1.57 to 5.48)
Consistent condom use with customers	236 (74.2)	47 (16.5)	p 0.3 0.56 (0.28 to 1.13)
Income from customer (per \$2.5 increase in payment)			p 0.2 1.05 (0.97 to 1.14)
Started sex work at age 16 or below	64 (20.8)	17 (21.4)	p 0.8 1.09 (0.49 to 2.43)
No regular non paying male partner	78 (24)	16 (19.3)	p 0.7 0.86 (0.42 to 1.78)
Change in regular partner over the past three months	19 (5.4)	5 (22.2)	p 1.0 1.02 (0.27 to 3.90)

⁴³ Adjusted for base line factors: i.e. age ethnicity religion and number of children

Table 9.3 describes the relationship between gender disadvantage and suicidal attempts in the past three months after adjusting for socioeconomic factors. Both physical and verbal intimate partner violence, violence from other people and sexual violence were strongly associated with suicide attempt. After further adjustment for other factors in this domain, multivariate analysis found that intimate partner violence ^{adj}OR 2.89 (1.55 to 5.37), violence from others ^{adj}OR 2.68 (1.37 to 5.25) and entrapment ^{adj}OR 2.68 (0.99 to 7.22) were associated with suicide attempts.

Table 9-3 Association between autonomy, social support, violence and suicide attempt in a cross sectional survey of 325 FSWs in Goa

Variable	Number & weighted % of the sample No (wt %)	Prevalence of suicide attempts 3m No (wt %)	Adjusted OR (95% CI) ⁴⁴
Autonomy			
Political empowerment (Ever vote in election)	169 (55.0)	33 (33.6)	P 0.1 1.01 (0.51 to 2.05)
Entrapment (Not free to leave sex work)	296 (90.7)	63 (28.1)	P 0.05 2.54 (1.01 to 6.44)
No financial autonomy	106 (35.0)	25 (19.0)	P 0.2 1.45 (0.77 to 2.75)
*Coerced unsafe sex with custome⁴⁵r	95 (26.9)	33 (30.3)	P 0.07 1.85 (0.96 to 3.55)
Social Support			
Recent lack of emotional support	196 (60.0)	50 (21.5)	P 0.1 1.67 (0.90 to 3.14)
Turn to intimate partner for support	65 (19.5)	12 (14.9)	P 0.3 0.69 (0.33 to 1.42)
Turn to family for support	21 (6.2)	3 (10.2)	P 0.2 0.43 (0.12 to 1.57)
Turn to other FSWs for support	114 (35.2)	27 (20.2)	P 0.6 1.21 (0.64 to 2.31)
Violence			
Police raid (Past year)	50 (14.0)	18 (30.8)	P 0.07 1.99 (0.95 to 4.18)
Intimate partner verbal abuse			P 0.001

⁴⁴ Adjusted for base line factors: i.e. age ethnicity religion and number of children

⁴⁵ *Items collected through confidential ballot

(Current)	108 (29.7)	40 (33.2)	2.99 (1.63 to 5.49)
Intimate partner physical abuse			P 0.001
(Current)	104 (29.8)	38 (31.8)	3.00 (1.60 to 5.62)
Any intimate partner violence			P 0.001
(Current)	124 (35.1)	43 (30.5)	3.13 (1.59 to 6.17)
Violence from others			P 0.003
(Current)	69 (18.9)	29 (35.9)	2.69 (1.41 to 5.11)
*Lifetime sexual violence			P 0.02
	36 (8.9)	18 (46.9)	2.88 (1.17 to 7.13)
*Childhood sexual abuse			P 0.2
	18 (4.6)	7 (41)	2.21 (0.58 to 8.39)

Table 9.4 describes the relationship between health indicators and suicide attempts in the past three months after adjusting for socioeconomic factors. Having exposure to HIV prevention interventions was associated with lower likelihood of suicide, but there was no association with any diagnosed sexually transmitted infections. Domain specific multivariate analysis also found that after further adjustment for other health related factors exposure to HIV prevention in previous 3 months remained associated with less likelihood of suicidal behaviours.

Table 9.4 Association between health related factors and suicidal behaviour in a cross sectional survey of 325 FSWs in Goa

Variable	Number & weighted % of the sample No (wt %)	Prevalence of suicide attempts 3m No (wt %)	Adjusted OR (95% CI) ⁴⁶
Sexual health			
HIV knowledge score			P 0.9 1.0 (0.96 to 1.04)
Lifetime exposure to sexual risk reduction interventions	110 (38.5)	17 (12.4)	P 0.07 0.54 (0.27 to 1.05)
Three month exposure to sexual risk reduction interventions	55 (19.3)	28 (16.3)	P 0.006 0.25 (0.10 to 0.68)
*Lifetime induced abortions⁴⁷	90 (24.9)	28 (16.3)	P 0.6 0.84 (0.45 to 1.59)
Infertility over past year			P 0.09

⁴⁶ Adjusted for base line factors: i.e. age ethnicity religion and number of children

⁴⁷ *Items collected through confidential ballot

	47 (14.8)	15 (29.8)	2.00 (0.91 to 4.41)
Presence of chlamydia, trichomonas or gonorrhoea			P 0.6
	75 (22.0)	25 (22.9)	1.17 (0.59- to 2.32)
HIV			P 0.9
	77 (25.8)	14 (16.0)	0.95 (0.46 to 1.93)
HSV-2			P 0.9
	180 (57.1)	39 (18.2)	0.97 (0.53 to 1.78)
Substance use			
Alcohol use			P 0.16
Never	137 (42.9)	33 (21.2)	1
Less than weekly	23 (6.2)	9 (31.0)	1.23 (0.43 to 3.50)
At least weekly	165 (50.9)	31 (15.2)	0.57 (0.30 to 1.11)
Gutka (chew tobacco)			P 0.9
Never	165 (47.6)	43 (31.2)	1
Less than weekly	21 (6.7)	5 (19.1)	1.41 (0.37 to 5.33)
At least weekly	139 (45.7)	25 (16.2)	1.07 (0.55 to 2.09)
Smoke			P 0.3
Never	290 (91.5)	58 (16.9)	1
Less than weekly	10 (2.4)	4 (27.3)	1.09 (0.26 to 4.58)
At least weekly	25 (6.1)	11 (43.0)	1.97 (0.68 to 5.67)

The final model (table 9.5) shows that after simultaneous adjustment for the factors from the base model and the factors from other domains ($p < 0.2$), intimate partner violence, violence from others, entrapment, and having regular customers, are independently associated with suicide attempts. Being of Karnataka ethnicity, having exposure to HIV prevention services in the past three months, and having at least one child were associated with lower probability of suicide attempts. After inclusion of mental health indicators into the model, we observed that having a higher (i.e. poor) mental health score was independently associated with suicide attempts. Inclusion of mental health did not effect the direction or magnitude of the distal determinants of suicide. There were no significant interactions between indicators in the final model.

Table 9.5 Multivariate analysis of the determinants of self-reported suicide attempt in the past three months

Variable ⁴⁸	Adjusted OR of final model ⁴⁹	P	Adjusted OR ⁵⁰ of final model including proxy measures of mental health	P
Age, years		0.1		0.07
<20	1		1	
21-25	0.47 (0.16 to 1.37)		0.36 (0.12 to 1.09)	
26-30	0.28 (0.08 to 0.97)		0.25 (0.07 to 0.87)	
31-35	0.95 (0.23 to 3.93)		0.81 (0.19 to 3.47)	
>=36	0.65 (0.18 to 2.31)		0.67 (0.20 to 2.29)	
Ethnicity Goan		0.02		0.01
Karnataka	1		1	
Other	0.41 (0.18 to 0.93)		0.47 (0.20 to 1.07)	
	1.13 (0.45 to 2.85)		1.04 (0.37 to 2.93)	
Hindu	0.74 (0.36 to 1.51)	0.4	0.81 (0.39 to 1.69)	0.6
At least one child	0.41 (0.17 to 0.96)	0.04	0.39 (0.17 to 0.91)	0.03
Intimate partner physical abuse	2.81 (1.45 to 5.45)	0.002	2.53 (1.29 to 4.98)	0.007
Violence from others	2.29 (1.16 to 4.54)	0.02	2.08 (1.05 to 4.12)	0.04
Entrapment (Not free to leave sex work)	2.48 (1.01 to 6.08)	0.047	2.41 (0.97 to 6.01)	0.06
One or more regular customers	2.70 (1.40 to 5.23)	0.003	3.08 (1.52 to 6.26)	0.002
At least one customer per week	1.85 (0.93 to 3.69)	0.08	1.62 (0.79 to 3.43)	0.2
Exposure to sexual risk reduction counselling past 3 months	0.29 (0.10 to 0.88)	0.03	0.30 (0.10 to 0.87)	0.03
Measure of poor mental health			1.06 (1.01 to 1.11)	0.02

⁴⁸ Only variable that remain in the model after multivariate logistic regression are reported in this table

⁴⁹ Adjusted for age, ethnicity, religion, number of children, time in sex work, ever work in Baina, number of customers per week, number of regular customers, payment per customer, entrapment, lack of emotional support, police raid, intimate partner physical violence, intimate partner verbal violence, violence from others, lifetime sexual violence, coerced unsafe sex, recent exposure to HIV prevention, infertility, and alcohol use.

⁵⁰ Adjusted for above plus k10 mental health score

9.4 Summary points

- Suicidal behaviours were very common, particularly in young women.
- Gender disadvantage - notably violence, entrapment and childlessness -, type of sex work and poor mental health were associated with suicide attempts.
- Sex workers who had attended a sexual risk-reduction session in the past three months were three times less likely to have attempted suicide in the same period.

9.5 Conclusion

Suicidal behaviours were very common in this marginalised and disadvantaged group of women. Both structural factors relating to gender and context of sex work, and, individual factors, such as poor mental health were independently associated with suicide. The study findings indicate that interventions to promote the health of female sex workers must prioritise mental health and suicide prevention, alongside the existing focus on HIV prevention. In order to reduce self-harm, the findings point to the need for a multi-pronged approach, which includes community mobilisation that organises, empowers, and provides the means for women to collectively confront violence (Pronyk et al. 2006) and improves access to mental health interventions for depression. The huge scale-up of HIV prevention interventions in female sex workers, and the seemingly protective effect of being in contact with HIV prevention services, implies that sexual health services may be the most appropriate vehicle to deliver quality mental health services to female sex workers.

10 Discussion

10.1 Key findings

10.1.1 Summary

Interventions targeting female sex workers are the key to controlling India's HIV/AIDS epidemic. Despite India's pioneering work on the effectiveness of collective action and community mobilisation on HIV prevention in female sex workers (Blankenship et al. 2008; Halli et al. 2006b; Jana et al. 1998; Reza-Paul et al. 2008) the policy environment of India continues to also permit events such as the Baina demolition or the closure of the dance bars in Mumbai (Prayas 2005; Research Centre for women's studies 2005). The detailed account of dismantling a red-light area given here suggested that sex-work was adaptive to changing circumstances. A concentrated, visible, area-bound and relatively homogeneous sex trade rapidly evolved into a clandestine, hidden, heterogeneous, and dispersed form. The social context of sex-work that emerged from this disruption was higher risk and less conducive to HIV prevention. In the short term, fear, insecurity and economic need de-prioritised health and in particular sexual health for female sex workers. Economic necessity and unfamiliar territory weakened their negotiating position. Populist rhetoric espoused by media and politicians, portraying the demolition as a means to rid Goa of evil, crime and HIV, eroded the sex workers trust and confidence in HIV prevention services. In the longer term, sex-work became dispersed and fragmented, very heterogeneous, mobile, and clandestine. Although, the overall numbers of female sex workers dropped in the immediate aftermath of the demolition,

soon new female sex workers, working in new ways, began to fill the vacuum. Ultimately, community mobilisation of female sex workers, a key to the successful sex worker interventions advocated by National AIDS Control Organisation (anon 2007; Reza-Paul et al 2008), has become more difficult, and the new entrants into sex-work have become harder to reach by the disrupted HIV prevention services.

When compared with other settings in India, the prevalence of sexually transmitted infections (STIs) and HIV in female sex workers in Goa was high (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). This study provides further evidence suggesting that structural factors and in particular those mediated through gender were strongly associated with sexual risk taking and the presence of sexually transmitted infections (STIs). The results also suggest that the type of sex-work and the context of sex-work impacts upon sexual risk. For example women who had never worked in Baina red-light area were more likely to have a curable STI compared to those who had ever worked in the brothel based sex work of Baina red-light area. Moreover, exposure to HIV prevention interventions reduced the likelihood of finding a curable STI.

Interventions to improve sexual health and HIV prevention for sex workers in Goa will require active engagement with structural factors, e.g. the legal and policy environment that impedes community mobilisation and promotes gender disadvantage. The shape of the desired intervention that emerged from this study was a complex and multifaceted intervention tackling amongst other things, gender-based violence, literacy, child-care,

and police violence. This intervention would have to be delivered through peer referral networks and community mobilisation.

The ability to reach a large number of hitherto unreached sex workers using a chain referral system like respondent driven sampling and the remarkable level of participation in the research process suggests that a peer-driven intervention is both feasible and desirable. The results, however, raise several structural constraints that need to be modified in order to replicate the effective interventions from elsewhere in India (Blankenship et al 1998; Reza-Paul et al 2008) within Goa. These structural constraints are the coercive environment surrounding sex-work; difficulty in sustaining the intensity of outreach worker contact time that the research project could afford in order to reach the women through peer referral; and the barriers to securing sustainable funding for the non-health related aspects of the intervention (particularly around gender and child-support), and STI treatment outside of public sector.

Finally, this study replicates the findings from elsewhere in India that the highest risk period for an individual female sex worker may be in the first six months to one year after initiation into sex work (Indian Council of Medical Research & Family Health International 2007). Targeted interventions may still have the desired public health effect through preventing onwards transmission of HIV, regardless of when they reach the female sex worker. However, to protect female sex workers from contracting HIV, we need to find ways to deliver interventions to female sex workers soon after initiation.

I will discuss the key findings in more detail under four sub-sections. Firstly the structural factors that impact upon the risk environment for female sex workers in Goa (10.1.2), secondly the epidemiology of HIV and STIs in female sex workers in Goa (10.1.3), thirdly sex-work in Goa in the aftermath of the demolition (10.1.4), and fourthly the health care needs of the sex workers (10.1.5).

10.1.2 Risk environment structure and agency

As described earlier, the evidence that a range of psychosocial and community-led processes underlie an individual's ability to access and adopt safer sexual behaviours has been growing (Blanchard et al. 2005; Blanchard et al. 2007; Campbell 2000; Kerrigan et al. 2003). Structural factors have in particular been implicated in the vulnerability of core groups to HIV (Parker et al 2000; Shahmanesh et al. 2008). Describing and understanding the upstream contextual factors determining female sex workers sexual risk, allows interventions to be tailored to alter the 'risk environment'. This evidence-based approach is likely to have contributed to the successes of the *Avahan* programme and other targeted interventions in the recent declines in HIV in the four high prevalence southern states of India (Moses et al. 2008; Reza-Paul et al 2008). The programme in Karnataka illustrates this approach well. First a comprehensive situation assessment was conducted to determine the nature, location and size of the sex worker population, and define the risk environment. On the basis of this assessment, preventative interventions for female sex workers were tailored to the local context. The core elements of the intervention were 1) individual/cognitive interventions for behavioural risk-reduction delivered by peer educators, 2) improved access to regular STI treatment, 3) structural

interventions upstream to create an enabling environment and 4) community mobilisation (Moses et al. 2008).

Structural factors are by their very nature context specific, for example, in northern Karnataka, traditional *devadasi* sex workers were found to experience less violence and stigma, and were less likely to be controlled by pimps and brothel owners. Consequently collectivisation of the female sex workers became a more appropriate strategy to scale up the interventions than one which targeted brothel-keepers or other gatekeeper (Blanchard et al. 2005; O'Neil et al. 2004). Evidence-based analysis of the risk environment has been the cornerstone of work to understand the structural factors that may explain the heterogeneity of the HIV epidemic in India and thus clues to its containment (Becker et al. 2007; Blanchard et al. 2007; Munro et al. 2008). One of the effects of the *Avahan* intervention in Mysore was the doubling of the average payment per client, and a corresponding reduction in client numbers. This reminds us that complex interventions may influence sexual risk in different and unexpected ways (Reza-Paul et al. 2008).

In this section I will discuss the structural factors that have important implications for HIV prevention interventions targeting female sex workers in Goa.

10.1.2.1 Socio-demographic particularities of Goa-based sex workers

The socio-demographic profile of Goa-based sex workers portrays a disadvantaged and vulnerable group of women. They were young women who had often started sex-work

before they reached the age of twenty. Compared to female sex workers surveyed in the Integrated Biological and Behavioural Assessment (IBBA), Goa based sex workers were younger; 38% under the age of 25 in Goa compared to 18% in Andhra Pradesh, Karnataka, Maharashtra, and Tamil Nadu (International Institute for Population Science (IIPS) & Macro International 2007; Ramesh et al 2008). Nearly half of the sex workers in this study started sex-work under the age of twenty compared with one in five in the IBBA (Ramesh et al. 2008).

The levels of poor literacy and school attendance, though similar to other female sex workers were higher than the average in women in India and much higher than the average in Goa (International Institute for Population Science (IIPS) & Macro International 2007; Ramesh et al. 2008). Female sex workers in Goa were also economically vulnerable, and the vast majority were in debt and supporting dependents.

Sex-work in Goa was dominated by non-ethnic Goans. The main migration link was with northern Karnataka. Not only were two thirds from northern Karnataka, but also most of their annual travel was to northern Karnataka. Many of the women's intimate partners resided outside of Goa. The qualitative data suggested ongoing links with home villages, particularly for weddings, births and deaths. The overwhelming migrant nature of sex-work was more similar to the large metropolitan sex-work of the red-light areas of Pune, Mumbai, Thane, Yevtamil, than the sex-work dominant in northern Karnataka and Andhra Pradesh (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008).

Intimate partner violence is extremely common in India. The National Family Health Survey (NFHS-3) found that 37% of women had experienced intimate partner physical or sexual violence (International Institute for Population Science (IIPS) & Macro International 2007). A population-based cohort study of women in Goa found a lifetime experience of verbal, physical and sexual abuse of 15% (Maselko & Patel 2008; Patel et al. 2006b). The prevalence of intimate partner violence amongst the sex workers in this study, although close to the national average, was higher than rural women in Goa. Moreover, female sex workers differed from other women in their experience of violence from the wider community i.e. police, clients, pimps, brothel owners, and community members. In contrast the female sex workers seemed to have greater financial autonomy than the average for women in India, suggesting some degree of autonomy, or ‘economic power’, was gained by their ability to earn (Blankenship et al. 2008). Sixty five percent of the sex workers in our study reported that they had financial autonomy compared to 45% of women in NFHS-3 (International Institute for Population Science (IIPS) & Macro International 2007).

10.1.2.2 Structural determinants of risk

As discussed in the introduction, by using hierarchical conceptual frameworks, that define levels of “risk causation” e.g. societal (super-structural), community (structural), institutional (infrastructural), and individual (Sweat & Denison 1995), in analysis we gain some insight into the determinants of risk in sex workers in Goa.

Both the qualitative and quantitative study suggested structural factors indicative of gender disadvantage contributed to entry into sex-work and increased sexual risk. Youth and illiteracy, indebtedness and support of dependents, migrant status and exposure to violence, limited access to HIV preventative and STI treatment services, were associated with female sex workers' sexual risk. These were similar to factors found to be associated with suicidal behaviours. The importance of structural/environmental determinants of sexual risk corroborates findings from neighbouring Karnataka (Blanchard et al. 2007; Halli et al. 2006; O'Neil et al. 2004). It also adds to the growing body of evidence linking intimate partner violence and gender disadvantage with HIV and sexual risk (Pronyk et al. 2006; Silverman et al. 2006).

10.1.2.3 Risk environment and agency

Acknowledging the role of structural factors in sexual behaviour change has led to a realisation that interventions need to alter the “risk environments” in order to enable the individual to adopt safer sexual behaviours (Desmond et al. 2005; Gupta et al. 2008; Wight et al. 2006). This enablement has often been described in terms of “empowerment” and “agency”. As discussed earlier empowerment is a process of politicisation, wherein a sex worker moves from consciousness, to knowledge to action. Ultimately the goal of empowerment is to move beyond just group identity to group agency. For female sex workers this has taken the form of collectivisation or community mobilisation (Blankenship et al 2008; Halli et al. 2006; Jana et al. 2004).

The effectiveness of collectivisation in Sonagachi and more recently the widespread community mobilisation of sex workers in Karnataka, Andhra Pradesh and Tamil Nadu have suggested that community mobilisation of sex workers can lead to gradual shifts in socially acceptable behaviours and thus improve HIV prevention (Blankenship et al. 2008; Halli et al. 2006; Jana et al. 2004; Moses et al. 2008; Reza-Paul et al. 2008). However, the very conditions of marginalisation and violence described in this study constitute important barriers to empowerment (Asthana & Oostvogels 1996). It is therefore not surprising that a controlled trial of structural interventions in female sex workers conducted in the Dominican Republic suggested that the policy milieu may be instrumental in allowing community mobilisation to become an effective reality (Kerrigan et al. 2006). That is to say that for individual behaviour change to be implemented through community mobilisation, there need also be changes at a societal level.

Using the same analogy the Baina demolition was a negative structural intervention, a catastrophic societal event that fragmented female sex workers collective identity and agency. The process of the demolition disengaged women and made them feel powerless. The women were rendered voiceless; with decisions regarding their lives being made in fora to which they had no access, using languages (English, Konkani, and written) with which they could not engage. They felt they were made a scapegoat for the HIV epidemic in spite of their engagement with the government's HIV prevention programme. The disruption of their social context, the forced dispersion, and the heightened animosity towards sex-work jeopardised the very collective identity (Campbell 2000; Cornish & Ghosh 2007), which has been associated with the successes

in reducing HIV in West Bengal and Tamil Nadu (Chandrasekaran et al. 2006) and successfully increased coverage of sex workers in Karnataka (Halli et al. 2006; Moses et al. 2008; Reza-Paul et al. 2008; Steen et al. 2006a). The violence of the demolition became the overriding violence in their lives, and all other violations, including HIV, became secondary (Downe 1997).

How did the forces of abolition and probation of sex-work, in direct contravention to the policies advocated by India's National AIDS Control Programme (NACP), prevail over advocates of harm reduction in Goa? By taking a closer look at the socio-political forces at play in Goa we can understand some of the barriers to empowerment of female sex workers and assess how these abolitionist forces fare in relation to female sex worker's agency. Here I would like to draw out three threads that converged to enable the events of June 2004 to occur. Firstly, the legal framework that conflates sex work with trafficking and thus inadvertently supports probation. Under the auspices of the Immoral Trafficking Prevention Act (ITPA), brothels are illegal; and the high court judgment that instructed the government of Goa to demolish the brothels was acting within the remit of this act. Secondly, sections of the social reform movements and women's movement in India oppose sex-work, which they interpret as sexual exploitation of women. Notably, it was a female counsellor and a social activist that brought her concerns about sex-work in Baina to the attention of the high court and started a process which eventually culminated in the judgement to demolish Baina. Following the high court judgment only a minority of the non-governmental organisations opposed the demolition on the grounds of women's right to be engaged in sex-work. The majority saw this as a means to secure the

rehabilitation of the female sex workers. Thirdly, the religious fundamentalists oppose sex-work as inherently immoral. This combined with the fact that the majority of Baina sex workers were migrants from other states, provided the newly elected BJP government with the populist anti-prostitute and anti-migrant rhetoric to implement the high court order with full impetus.

The convergence of these forces can be seen in other settings too. There was a similar mixed response to the closure of the Mumbai dance halls with some women's groups supporting and others opposing it (Prayas 2005; Research Centre for women's studies 2005). Similarly the proposed amendments to immoral trafficking prevention act of India, which aims to penalise clients, have been introduced by the ministry of family and social welfare, supported by the ministry of home affairs and opposed by the ministry of health. Both of the abolitionist discourses, religious or social reformist, converge at the point that they strip the female sex worker of any agency, whether through stigmatising her as engaged in an immoral profession, or, depicting her as a victim of trafficking.

There has been much attention paid to the role of stigma and its impact on self-esteem and agency in marginalised populations (Campbell 2000; Cornish & Ghosh 2007). There are suggestions from studies in northern Karnataka, and our unpublished data, that traditional sex workers, whose sex-work has a degree of social sanction, seem to experience less stigma and violence from the community (Blanchard et al. 2005; O'Neil et al. 2004). The vocal animosity of the media, the church, politicians and neighbouring communities preceding the demolition heightened the stigma and outsidersness the women

felt. The police harassment and systematic hounding of sex workers out of Goa that continued following the demolition compounded the marginalisation and outsiderhood. Bama sex workers were forced to take on alternate identities, for example to don the traditional attire of the family woman - the sari.

In contrast with the simplistic narratives of the abolitionists, i.e. the prostitute as a fallen woman or a victim of evil traffickers, the actual life narratives described here portray a far more complex interplay between life conditions, events and choices. Throughout the study we see that female sex workers express their agency through small and individual actions (Campbell 2000; Cornish & Ghosh 2007). Even following the demolition they continued to adapt to the increasingly hostile and high-risk environment. In part they engaged with the research because it provided them with an arena to vocalise their needs and aspirations. This flexibility shows a degree of agency that a purely structural analysis of the post-demolition risk environment would not explain (Asthana & Oostvogels 1996; Cornish & Ghosh 2007). In keeping with other work that suggests the creative force that agency brings, (Corbin 1990; Hershatter 1992; Walkowitz 1980; Campbell 2000), this study describes a more dynamic relationship between the sex worker and her environment.

10.1.3 Sexually transmitted infections and HIV

The prevalence of sexually transmitted infections (STIs), HIV and re-infection rates were very high. Curable STIs were five times more common in the study participants compared with rural women in Goa (Patel et al. 2006c). Overall, using the Integrated

Biological and Behavioural Assessment (IBBA), conducted in the six high prevalence states in 2005-6, as a comparison, both HIV and STI prevalence in female sex workers in Goa were amongst the highest recorded in India (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). The overall prevalence of HIV in Goa was double the average HIV national prevalence in female sex workers and was closer to the prevalence recorded in areas with brothel and lodge-based sex-work such as, Belgaum, Kolhapur, Yevtamel and Pune (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008).

The HIV epidemic in India is extremely heterogeneous. This is reflected in the core group prevalence of HIV, where marked clustering has been noted not just at a state and district level, but even between villages (Blanchard et al. 2007; Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). Movement between Goa and the neighbouring districts in Karnataka and Maharashtra, termed the 'corridor of mobility', is very high, and this may partly explain the similarly high prevalence of HIV in Goa female sex workers and those of Kolhapur in Maharashtra and Belgaum in Karnataka compared to other districts within these states (Ramesh et al. 2008). What is perhaps more surprising is that, although in general Goa performs better than other states for most health indicators, the prevalence of curable STIs found in the sex workers in this study is so much higher than female sex workers in the neighbouring districts of Karnataka and Maharashtra and elsewhere in South India. In fact it more closely resembles the street and non-brothel based sex workers of Mumbai, Thane and Pune (Indian Council of Medical Research & Family Health International 2007).

This can be partly explained by the lower exposure to HIV prevention experienced by non-Baina based female sex workers of Goa compared to similarly dispersed female sex workers in South India. For example some contact with a non governmental organisation (NGO) or HIV prevention service was documented by between 70 and 90% of sex workers in Karnataka, Tamil Nadu and Andhra Pradesh (Indian Council of Medical Research & Family Health International 2007) compared with 40% of the female sex workers in this study. The much lower exposure to HIV prevention services in dispersed and non-Baina sex workers in Goa resembles more closely the larger urban centres such as Chennai and Mumbai as well as street-based and non-brothel based female sex workers of Maharashtra (Indian Council of Medical Research & Family Health International 2007).

An alternative explanation would be that following the demolition there was an abrupt disruption of STI services which was coupled with the influx of new sex workers. The evidence from targeted STI intervention studies suggests that provision of regular STI treatment, whether presumptive or regular screening rapidly reduces the prevalence of curable STIs in high risk groups (Cowan et al. 2005; Ghys et al. 2001; Kaul et al. 2004; Shahmanesh et al 2008; Steen & Dallabetta 2003). More recently evaluation of the programmes in Karnataka, India has corroborated this finding with adjusted odds ratio of chlamydia, gonorrhoea and trichomonas of 0.5, 0.4 and 0.3 respectively, following introduction of the *Avahan* intervention (Reza-Paul et al. 2008). Moreover, the evaluation of a STI treatment voucher programme for sex workers in Nicaragua,

suggested that reductions in STI prevalence were only sustained if the intervals between voucher distributions were less than six months (McKay et al. 2006). The fragility of STI control suggests that the sudden withdrawal of regular, free and accessible STI treatment through the demolition could explain the particularly high STIs prevalence found in Goa-based sex workers post-demolition.

The differences in STI prevalence in this study compared to the IBBA is unlikely to be explained by differences in data collection. The IBBA was conducted at more or less the same time as our survey, with representative samples of female sex workers, using similar sample sizes, similar biological sample collection and laboratory assays with similar sensitivity and specificity.

The presence of a treatable bacterial STI is a marker of recent sexual risk. Several structural factors, suggesting gender disadvantage, were independently associated with having a bacterial STI, namely youth, lack of schooling, childhood sexual abuse, deliberate-self-harm, and lack of financial autonomy. Street-based sex workers and those who had regular customers were particularly vulnerable (Indian Council of Medical Research & Family Health International 2007; Ramesh et al 2008). Our ethnographic study suggests there were additional pressures to forgo condom use with the “more intimate” regular customers. Moreover, female sex workers with regular customers were more likely to be part-time, work from home, and use mobile phones, suggesting a more marginalised group devoid of peer support and collective identity.

Those who demonstrated greater knowledge of HIV prevention and who accessed free and dedicated STI services had lower likelihood of having an STI; suggesting that sexual risk reduction interventions were effective in either reducing high-risk behaviour or improving recognition and treatment of STIs. This mirrors the finding in Mysore, where *Avahan* programme exposure was found to be strongly associated with both condom use and STI reductions in the 400 female sex workers who participated in a cross-sectional survey conducted 30 months after the base-line survey (Reza-Paul et al. 2008). The reduced probability of STIs among women who had exposure to HIV prevention interventions could be explained through a number of mechanisms. Firstly, HIV prevention is often done in groups and involves a degree of collectivisation that can be protective of women's sexual health. Secondly, sex workers that access services may be a "different type" of sex worker, i.e. more empowered, more health conscious and less disadvantaged. The paradoxical association between no symptoms and presence of an STI may be explained by the fact that women with symptoms were more likely to have visited a health care provider and thus receive an antibiotic.

Non-Goan sex workers were less likely to have bacterial STIs. Non-Goan sex workers from Karnataka follow the *devadasi* tradition, i.e. being dedicated to the temples as young girls. Studies from Karnataka (Blanchard et al. 2005) and this study suggest that *devadasi* women have a more cohesive identity and are less likely to experience violence from customers and police. This is attributed to the widely held belief that *devadasi* women are protected by the goddess *Yellamma* and should not be harmed. Goan sex workers in contrast are extremely stigmatised and live under the daily threat of disclosure and exclusion from their communities. Moreover, many of the non-Goan sex workers

had practised in Baina red-light area prior to the demolition and self-identified as sex workers, and were part of a larger network of independent sex workers. They may also have been exposed to the extensive HIV prevention interventions in their native Karnataka. Goan sex workers who had entered sex work since the demolition of the red-light area, on the other hand, worked in isolation though mobile phones, and were less likely to be professional or networked. The qualitative data, also, suggested that male clients were less likely to insist on condom use with Goan sex workers, whom they perceived as less likely to carry HIV.

A survey of a representative sample of 10,000 female sex workers from the four high prevalence states in the south of India found a similar magnitude of association between brothel and lodge-based sex-work and prevalent HIV as in this study (Ramesh et al. Blanchard 2008). Several studies from India have noted the higher prevalence of HIV in widowed/separated and unmarried women compared with currently married women (Ramesh et al. 2008). This difference was also observed in this study. In addition, we found that women with intimate non-paying partner were less likely to have HIV, suggesting that either, women with HIV have lost their partners to HIV, or, that having an intimate partner is a measure of social capital or other residual differences that we have not measured in this survey.

Recent migrants were more likely to have HIV. This, as in other settings, probably reflects the higher prevalence in northern Karnataka, their place of origin. Similarly, the association with being Hindu may be consequent to the prevalence of HIV in

uncircumcised partners in the women's non-paying sexual networks (Reynolds et al. 2004). Condom use with non-paying sexual partners was, as in many settings, extremely low (Reza-Paul et al. 2008). Understanding these sexual networks, within which sex workers engage in unprotected sex, may identify more vulnerable sub-groups to target for both HIV prevention and treatment programmes. Devising alternative strategies for HIV prevention with the non-paying intimate partner, such as the female condom and/or voluntary testing and counselling, need to be implemented and evaluated as a matter of urgency.

Age stratified HIV prevalence data from the IBBA suggests that women become infected with HIV within the early stages of their entry into sex work (Indian Council of Medical Research & Family Health International 2007). Our study suggested a similar picture, with HIV prevalence increasing from less than 10% in women who have been in sex-work for less than a year, to 30% in those that have been in sex-work for more than one year. This mirrored the prevalence of HIV by age which increased rapidly to a plateau at age 20. The prevalence of curable STIs, a marker of recent sexual risk, is a mirror image of HIV, with young women under the age of 20 and those who had recently started sex work having the highest rates of curable STIs; 50% and 30% respectively. This suggests that currently targeted interventions though effective at reducing onward transmission to the general public are failing the sex workers themselves. If we hope to reduce the sex workers risk of acquiring HIV we have to reach sex workers within the first six to twelve months following initiation. Moreover, any social change, e.g. the shift from brothel based to non-brothel based sex work that increases the turnover of sex workers, may

reduce the proportion of sex workers with HIV, at any given time, but may paradoxically increase the absolute number of women who are at risk of contracting HIV through sex-work.

10.1.4 Sex work in the aftermath of the demolition: dispersed versus concentrated

Post-demolition, sex-work in Goa evolved from one in which the majority were red-light area brothel-based sex workers to, one in which many of the non-brothel based types of sex work that already existed in other parts of south India began to dominate the sex-work scene. In addition sex-work was now practised over a far wider geographical area and involved a much larger number of sites and establishments. The heterogeneous sex work that emerged from the demolition consisted of street-based sex workers soliciting in railway stations, bus-stops and municipal parks; sex workers working 10-14 day contracts in lodges throughout Goa; women working from home and through mobile phones; sex workers on short-term contracts to male ‘pimps’ and confined to flats; female construction workers and women residing in urban slums subsidising their meagre income with transactional sex; and the survivors of the Baina demolition continuing to operate from the neighbouring slums.

Sex workers in Goa shared many features with sex-work elsewhere in south India. The proportion ever married were amongst the lowest, whilst having a regular non-paying partner was amongst the highest compared to sex workers in south India (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). Regular

clients and home or street-based sex-work were less common than reported elsewhere in south India. However if the ex-Baina sex workers were excluded from this analysis, a picture more similar to non-brothel based sex-work in India emerges, i.e. one in which the women work from home or solicit in public spaces, have more regular clients, and fewer occasional clients. Taking the women in this study as a whole, lifetime HIV testing and consistent condom use was similar to elsewhere in India (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008). However, if we only look at the non-Baina sex workers, a different picture emerges; one of lower HIV knowledge and lower consistent condom use (Indian Council of Medical Research & Family Health International 2007; Ramesh et al. 2008).

In contrast with the IBBA, this study found that the homogeneous ex-red-light area based female sex workers were at lower risk of curable STIs than the heterogeneous dispersed female sex workers that materialised after the demolition (Indian Council of Medical Research & Family Health International 2007). Part-time, dispersed, home and street-based female sex workers filled the void left by the demolition. These non-Baina sex workers were more likely to have curable STIs, a biological marker of recent sexual risk. This finding was in keeping with their lower likelihood of reporting consistent condom use with clients (Shahmanesh et al. 2008) and supports the hypothesis that the non-Baina-sex workers were more likely to engage in high-risk behaviour. Although this may partly be explained by lack of exposure to HIV prevention interventions, the persistence of higher odds of curable STIs even after adjusting for behavioural and knowledge indicators, suggests that more proximal determinants, such as the type of sex work, their

greater experience of sexual and intimate partner violence and their social isolation and lack of collective identity may also play a part.

Ex-Baina sex workers were more likely to have HIV, although this difference was not statistically significant after adjustment for confounding. The three potential confounding factors that had the greatest independent effect on HIV prevalence in the multivariate model were duration in sex work, number of clients and having a regular client. This suggests that the higher prevalence of HIV in ex-Baina-SWs may be explained by their longer duration in sex-work, greater number of clients, and perhaps reduced condom use with regular clients. Ex-Baina-SWs were also more likely to have migrated from the higher prevalence areas of northern Karnataka, which was an independent risk factor for HIV.

The only data on HIV prevalence in female sex workers in Goa available for comparison was that collected during the annual sentinel surveillance. On face value this would seem to suggest that our findings of a post-demolition HIV prevalence of 26% in FSWs is lower than the 30-50% reported in the pre-demolition sentinel surveillance. However, anecdotal reports from the non-governmental organisations and ex-Baina sex workers suggested that sentinel surveillance data was a convenience sample collected from higher risk sex workers, i.e. older and better known Baina based sex workers and those who were attending public sector sexual health clinics for syphilis testing. Moreover, the HIV prevalence of 36.6% that we found in ex-Baina sex workers is close to that recorded in the pre-demolition sentinel surveillance and as explained above seems to be partly

explained with greater lifetime risk of exposure to HIV, i.e. longer duration in sex work and higher client numbers.

The increased risk of STIs among dispersed sex workers, which is likely due to the disruption of HIV prevention services, is of a similar magnitude to the reductions recorded in successful sex-work interventions (Shahmanesh et al. 2008), including recent studies from Karnataka (Reza-Paul et al. 2008). Similarly, the successes of interventions to reduce structural vulnerability to HIV, e.g. Thai 100% condom use and Sonagachi empowerment model (Hananberg et al. 1994; Jana et al. 2004; Rojanapithayakorn & Hananberg 1996), support the finding that less mobilised, street and home-based sex workers, working in divided and clandestine conditions would likely be more vulnerable.

10.1.5 Health care needs

One of the key findings in this study corroborates findings elsewhere that private health care was most widely used. In fact less than one in ten women reported having accessed a free public or non-governmental organisation (NGO) sexual health service in their lifetime with the majority evenly split between accessing no services and accessing private health care. This suggests that sex workers health seeking behaviour is similar to the general population of India (Hawkes & Santhya 2002; International Institute for Population Science (IIPS) & Macro International 2007). Concern about the quality of care and respectful treatment were the main reasons women gave for selecting private health care. The disruption of both government and non-governmental STI clinics following the demolitions were further barriers to access care. Stigma was another factor

that impacted upon sex worker's seeking treatment for their STIs. Stigma was one of the barriers to accessing care from stand-alone STI services clinics, which they feared would identify them as sex workers. Stigma also impacted upon their accessing of public health services, where they felt discriminated against as migrants and sex workers. In its extreme manifestation this led to the tragic deaths of the ex-Baina sex workers who preferred to travel back to their home states rather than access public health services in Goa (Scambler & Paoli 2008).

Access to HIV prevention technologies and overall HIV knowledge compared unfavourably with elsewhere in India and in particular with neighbouring Karnataka. Although consistent condom use with clients was high, rates of breakage, and non-use due to the use of force and financial inducement were also high. The systematic review of HIV prevention in sex workers found that much of the evidence for the efficacy of condoms in HIV prevention have been collected from programmes with high access to free or subsidised condoms (Shahmanesh et al. 2008). It is therefore of particular concern to see that two decades into the epidemic only one in five sex workers in the study reported having access to free condoms. As with most other settings condom use with intimate partners was negligible (Reza-Paul et al. 2008).

One in four women had aborted an unintended pregnancy and the use of reliable contraception was very low (Wayal, unpublished Masters Dissertation). Moreover, there was no relation between access to HIV prevention services and contraceptive use. This suggests that the separation between two vertical programmes, sexual and reproductive

health and HIV prevention, has prevented even simple sexual health messages from permeating the targeted HIV prevention interventions in Goa (Wayal, *ibid*). One of the clear messages that we received from the sex workers during the dissemination was that they wanted a greater integration of sexual health services with maternal and child health services.

The prevalence of suicidal behaviours, particularly in young women in this study, was remarkably high. Suicide is a leading cause of death in young women in India (Aaron et al. 2004; Vijayakumar et al. 2005). A prospective cohort of 2,494 women in Goa found a 0.8% annual incidence of attempted suicide (Maselko & Patel 2008). A cross-sectional study of 3,662 young people in Goa found that 6% of 16-24 year old women had contemplated suicide in the past three months (Pillai et al. 2008). This study reports on a particularly disadvantaged group of women who have traditionally been excluded from mainstream health policies and services. A Chinese study in a comparable population, found 14% of FSWs had contemplated and 8% had attempted suicide in the preceding six months (Hong et al. 2007).

The finding of this study suggests that the key factors associated with suicide amongst female sex workers were gender disadvantage i.e. violence, entrapment and childlessness, and a more socially isolated working environment. The similarity between factors associated with both sexual risk and suicidal behaviours were striking. This suggests that interventions to modify these risks may have impact upon multiple health outcomes. Moreover, the seemingly protective effect of exposure to HIV prevention interventions

on suicidal behaviours suggests that the scaled up HIV prevention interventions could become a vehicle for the provision of mental health services.

Although access to HIV testing was moderately good, women were not accessing care. The HIV interventions that targeted the female sex workers in Goa were primarily concerned with HIV prevention. There was little HIV care and treatment provided. Antiretroviral therapy was almost exclusively available through the public sector. This created a barrier for the female sex workers to access HIV treatment. Another potential barrier that was not fully explored in this study was the ways in which participating in an antiretroviral programme would inadvertently disclose their HIV status and thus lead to a loss of income. One final aspect that emerged from the illness narratives of sex workers who knew their diagnosis was the acceptance of HIV as an inevitable and to some extent deserving consequence of sex work.

10.2 Strengths and limitations

The strength of this study is that we have a representative sample of female sex workers including different networks and types, many of whom had never accessed services, either because they had not been in sex-work for long or they had not been visible to services. We used standardized and field-tested tools for the diagnosis of self-harming behaviours, socio-demographic, health, and gender disadvantage indicators, which were culturally appropriate and validated (Cowan et al. 2005; Furukawa et al. 2003; Kessler et al. 2002; Kessler et al. 2003; Morison et al. 2001; Patel et al. 2005; Patel et al. 2006a).

The rest of the questions were informed by the qualitative data, translated and extensively field-tested.

10.2.1 Bias

A dedicated team, familiar with sex work, conducted this study. The researchers were actively engaged in advocacy. The community advisory board sought refuge in our community centre, and we provided material support post-demolition. This lack of ‘distance’ may have resulted in interviewer bias. Similarly, our association with HIV prevention may have resulted in social desirability bias. Nevertheless, the fact that we could collect these rich data is testimony to these relationships. Furthermore, behavioural data collected through the survey were consistent with data collected through qualitative methods, informal confidential voting interview, and biological markers (Gregson et al. 2002; Gregson et al. 2004).

The long duration of recruitment reflects the difficulties of reaching this hidden population in the coercive environment following the demolition. Although this could theoretically lead to temporal changes in behaviour over time, we did not find any evidence to suggest this. Female sex workers were constantly adapting to the changing post-demolition environment. This may have led to some misclassification bias in the typology of sex work.

Formative work showed dried blood spots to be more acceptable and feasible to collect than whole blood. However, this may have led to misclassification bias. Whereas the

HIV kits used have been validated for dried blood spots, this was not the case for Focus HSV-2 kit. Although it is reassuring that, when compared against HSV-2 testing in serum, sensitivity and specificity analysis of DBS using 32 samples was 91% and 100% respectively; this is a small sample and must be viewed with caution. The use of the BED detuned assay for incident HIV can misclassify late infection as early, therefore the HIV incidence reported here must also be interpreted with caution (Centre for Disease Control 2007; UNAIDS 2006).

In order to reduce selection bias we used chain sampling, where an approximate probability of recruitment can be calculated for each participant and then inverted to form weights, for an approximately unbiased analysis. However, although we are confident that the majority of networks are represented in the final sample, this is not a true probability sample survey. In particular bias may arise in our analysis if the selection of network members for recruitment is based on factors related to outcome measures. For instance if women were more likely to refer someone they thought to be high risk for an STI or HIV, otherwise known as assortative referral.

10.2.2 Confounding

We have compared Baina with non-Baina sex workers. The speed with which events unfolded meant that quantitative pre-demolition data were unavailable for comparison. As recruitment started soon after the demolition, it was likely that the Baina sex workers would approximate to the sex workers working in Baina prior to the demolition whilst the non-Baina sex workers would represent the types of dispersed sex-work that dominate the

sex trade following the demolition, some of whom may have been present before. It remains possible, however, that the Baina-sex workers who continued to practice in Goa are different to those who left.

Although we included all the factors associated with STIs and HIV in the literature there is always the possibility of residual confounding by unknown variables or variables that have not been measured.

10.2.3 Chance

This was a cross-sectional study and the direction of effect is unclear. Some of the associations may be equally explained by reverse causality, for example the association between HIV and dysuria could be equally explained by, an increased risk of acquiring HIV in the presence of genital infections as an increase in symptomatic infections in the presence of HIV. The reduced likelihood of finding HIV in women with intimate male partners could be because women with intimate partners have greater social capital, or, it could be an artefact of their intimate partner having died of HIV.

We constructed hypothesis-driven conceptual hierarchical frameworks for analysis that were derived from the literature. This would reduce the likelihood of finding spurious associations by chance. Despite placing a very high p value (0.2) for inclusion of variables, the use of stepwise multivariate analysis at each level of the conceptual framework may still have resulted in the dropping of an important variable due to chance.

There is also a risk, that by imposing a hierarchy on exposure variables we inadvertently lose an important distal exposure that is completely mediated by a proximal variable.

The weights were defined based on several factors, one of which was the number of female sex workers from which the respondents recruits were recruited from; i.e. the respondent's network size (Magnani et al. 2005). Although we piloted this question extensively to ensure that we were measuring what we purport to measure, we have no independent means to verify the accuracy of self-reported network size. Furthermore the full complexity of the respondent driven sample is not reflected in the standard errors, and so without boot strapping, the confidence intervals and p-values should be viewed as approximate (Salganik 2006).

10.2.4 Challenges

Conducting research in turbulent times such as a demolition brings particular challenges from adapting to continuously changing circumstances to engaging with hidden and distrustful study participants.

Even prior to the eviction Baina was a complex setting with a multitude of interest groups jostling for dominance. With the threat of the demolition and then the loss of income and uncertainty following the demolition came a heightened sense of competition and worsening of erstwhile ethnic and class tensions. These manifested themselves in distrust of educated researchers and NGO workers and thus greater barriers to the communication across class and caste boundaries. The heightened ethnic identity led to greater

allegiance to organisations and researchers that were perceived to be of the same ethnicity.

The researchers on the other hand felt a mixture of anger, impotence and guilt as they realised that they were unable to prevent the events that unfolded. The demolition was an emotionally charged time in which research staff felt alienated from their families and friends who, frequently agreed with the demolition. Moreover, advocacy on behalf of the sex workers often brought the research staff into direct confrontation with government and law enforcement agencies. This occasional confrontation with the law enforcement agencies and criminal elements continued as the success of the mapping drew the researchers deeper into the nexus between prostitution and organised crime. There was also suspicion of research funded by foreign agencies.

Mapping is an arduous task and placed huge physical demands on the staff that spent hours walking up and down in the dust and heat. They were required to map the same area at different times of day and night in order to observe sex-work that may occur in the evenings or early mornings. Constant harassment and fear of arrests and fines meant that women, particularly ex-Baina women, were constantly relocating making it hard to recruit seeds from some of the more mobile networks. Post-demolition, raids elsewhere in Goa increased. Consequently, pimps and other mediators of the sex trade were also very suspicious of the research team. Breaking into the northern tourist belt, where better-paid contract girls worked was therefore particularly challenging. Intermittent

police raids constrained mapping and set back the research as key informants cultivated over months went to jail or vanished.

Other studies have observed that recruiting female sex workers using respondent driven sampling is slower compared to injection drug users (Malekinejad et al. 2008). In our study we found that following a referral, the process of recruitment was a protracted process of gaining informed consent and finding a time and a place that was agreeable to the respondent. Often the respondent would then miss the appointment because she had a customer, or was drunk, or got into a fight, or just didn't feel like it. Other factors that contributed to the success or failure of recruitment were the role of peers. Networks where the seed was enthusiastic and positive about the study recruitment flowed easily from wave to wave, whilst recruitment in networks where one of the respondents was antagonistic towards the study was much slower.

Heterogeneous sex workers were recruited over a large geographic area and in very diverse settings. This created both logistical and coordinating challenges. Private areas for interviews and sample taking had to be identified in each setting; survey tools and kits needed to be available at these settings; unique numbers had to be distributed; samples had to be taken and returned to the central collection spot for transport to the laboratory; interviewers with the required linguistic ability had to be available; and all of this had to be supervised for quality control and training. Yet, these precise and carefully coordinated plans were overthrown daily by the reality and violence of the women's

lives. Much of the researcher's time was taken up by tackling the fallout of intimate partner violence, fighting with peers, and unintended pregnancy among the women.

10.3 Implications for HIV prevention

As discussed in the introductory chapters the evidence suggests supports 'highly active HIV prevention', i.e. utilising the potential synergistic effect of combining interventions situated at the level of society (structural), community (participation and empowerment) and the individual (cognitive, behavioural and biological). Consequently, I have situated the implications of this study for HIV prevention amongst female sex workers within this tripartite framework.

In keeping with the evidence we found a relationship between HIV knowledge and recent sexual risk (Shahmanesh et al. 2008). However, effective interventions to improve individual sex workers cognition of sexual risk have often been implemented in clearly demarcated areas; either red-light areas or well-defined public spaces where sex workers solicit. Our study indicated that structural factors such as the dispersion and the clandestine sex-work that emerged following the demolition of the red-light area created important barriers to the delivery of individual cognitive and behavioural interventions to female sex workers. While reversing the demolition of Baina red-light area is not feasible, there are good examples of effective community level interventions that may help overcome the structural barriers, for example collectivisation (Halli et al. 2006), wherein empowered female sex workers develop and deliver interventions themselves, or peer-delivered interventions, which have reached the majority of female sex workers in

parts of Karnataka (Moses et al. 2008; Reza-Paul et al. 2008; Steen et al. 2006). Although feasibility of effective collectivisation of disempowered and non-professional sex workers is in doubt (Asthana & Oostvogels 1996), our success at reaching some of the most hidden networks through respondent driven sampling is encouraging for peer-driven interventions.

One of the biological interventions suggested as part of ‘highly active HIV prevention’ is reducing the burden of curable STIs. Unfortunately achieving this in our study population through syndromic management is constrained by the absence of relationship between symptoms and STIs as well as high STI re-infection rates. A combined approach of providing presumptive treatment for curable STIs followed by regular algorithm driven screening has been advocated for female sex workers and seems to have been effective in the neighbouring areas of northern Karnataka (Reza-Paul et al. 2008). However, again the challenge remains how to deliver treatment to such geographically dispersed women. One possibility is to utilise respondent driven sampling type vouchers and incentives to refer cases to a mixture of public, private and non-governmental accredited services. An alternative approach might be to again implement the intervention through community mobilisation and delegate treatment delivery to experienced peers or out-reach workers.

Although the effectiveness of tackling structural factors on HIV risk is yet to be proven in a randomised controlled trial (Pronyk et al. 2006), our study suggests that interventions to empower women in managing their finances, and tackling violence from intimate

partners and society warrants further evaluation. Given the close relationship between risk factors for sexual risk taking and suicide, structural interventions may improve outcomes in more than one health condition. This logic can be extended to healthcare delivery as well. Clearly sex workers are faced with a range of health issues. Expanding targeted interventions to deliver services beyond a narrow STI and HIV focus, for example sexual and reproductive health services; mother and child services; HIV care; and mental health services, may make the services more acceptable, and also improve health outcome of sex workers and their families.

Out of the process of dissemination to the sex workers there emerged an intervention that was multifaceted and included interventions at societal, community and individual level. It included provision of mental health services, literacy programmes, skill building, financial management, legal support, childcare, psychological support and community centres. Although STI treatment and sexual health services were identified as a core need, there were concerns about the stigmatising nature of stand-alone services as well as moral concerns about free treatment available for the individual sex workers whilst her dependents remain uncared for. Consequently a picture emerged of sexual health services nested within private practice, mother and child clinics as well as stand-alone government and NGO clinics. One in four sex workers already had HIV and there was a well-articulated mistrust of public sector treatment. This suggested that integrating HIV testing and antiretroviral treatment into outreach services would improve access and acceptability of both HIV and STI services.

There remain structural barriers to community mobilisation and implementing peer-driven intervention in the context of Goa. It took 5,000 hours and eleven researchers to recruit 326 women. The dispersion and diversity of sex-work suggests needing a multitude of different community-based approaches tailored to different settings. For example collectivisation, drop-in centres, out reach clinics and peer-driven interventions would be effective for the street-based sex workers of the main urban settings and the sex workers living in and around Baina. On the other hand a community-based intervention for all the long and short-term migrants in the slums would be better suited for the 'family women'. The mobile phone sex workers and female construction workers would be best accessed using a peer driven intervention delivery, with the health care provided through vouchers for private clinics. The lodge-based women and short-term contract women can only be reached through interventions that target the gatekeepers, with STI care delivered within the lodges and flats.

Clearly this intervention will need to be responsive, with large number of peers and outreach workers representing all the major ethnicities and languages. There will need to be concurrent interventions at a societal level, involving active advocacy with the police and communities to reduce the sex workers fear and harassment. There needs to be an ongoing effort to challenge the prohibitionist approach to sex-work in all its manifestations, nationally, internationally and locally. There needs to be an active engagement with the brokers and recruiters into sex-work to ensure that interventions are delivered to women as soon as they enter the sex trade. There will need to be sustainable funding for the non-STI and HIV aspects of the intervention.

10.4 Concluding remarks

This study provides further evidence for structural and gender-based determinants of HIV and STIs. Following the demolition of the red-light area, sex workers in Goa became a dispersed and heterogeneous group, with high levels of treatable bacterial STIs and HIV, suicidal behaviours and limited access to services. Given that those who accessed free STI services and had good HIV knowledge were at lower risk of bacterial STIs it is paramount that successful interventions are rapidly scaled up. In order to reduce self-harm, our findings point to the need for a multi-pronged approach which includes community mobilisation that organises, empowers, and provides the means for women to collectively confront violence and improves access to quality mental health services. Passing intervention delivery to empowered sex workers will likely raise the expectation that the underlying factors that increase their vulnerability to HIV, STIs and self harm are also tackled. The challenge will be to move beyond tokenistic stakeholder involvement and secure sustainable funding for multifaceted individual and structural interventions.

Abolitionist or ambiguous approaches to sex-work both worsen the stigma and exclusion that female sex workers experience. Policy and legislation that either criminalises nearly 1% of the India's adult female population or renders them invisible victims without agency further marginalises and disempowers this group. Instead, we need to support legislative or policy changes that support sex workers agency; policy that creates an enabling and safer risk environment within which sex-work occurs; an environment that encourages sex workers to organise and collectively bargain for their rights, and improved and safer terms and conditions of work.

11 References

Chapter 2

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Chapter 3

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12 Appendix

12.1 Publications

1. Targeting commercial sex-workers in Goa, India: Time for a strategic rethink? M Shahmanesh, S Wayal, *The Lancet* 2004; 364 (9442) : 1297-9
2. Effectiveness of Interventions for the prevention of HIV and Other sexually transmitted infections in female sex workers in resource poor settings: A systematic review. M Shahmanesh, V Patel D Mabey, FM Cowan, *Tropical Medicine and International Health* 2008, 13 (5): 659-79
3. Towards evidence based HIV prevention: The burden and determinants of HIV and sexually transmitted infections in a population based sample of female sex workers in Goa. M Shahmanesh, FM Cowan, S Wayal, A Copas, V Patel, D Mabey, *Sexually Transmitted Infections*
4. Beyond HIV prevention: The suicidal behaviours of female sex workers in Goa. M Shahmanesh, S Wayal, FM Cowan, D Mabey, A Copas, V Patel, *American Journal of Public health* (in press)
5. HIV prevention while bulldozers roll: A study exploring the effect of the demolition of Goa's red-light area. M Shahmanesh, S Wayal, G Andrews, V Patel, FM Cowan, G Hart. *Social Science and Medicine* (resubmitted following invitation to respond to reviewers comments)
6. A study comparing sexually transmitted infections and HIV amongst red-light area and dispersed sex workers following the demolition of the red-light area. M Shahmanesh, S Wayal, A Copas, V Patel, D Mabey, FM Cowan, *JAIDS* (resubmitted following invitation to respond to reviewers comments)

where adult men and women more commonly report a history of extramarital sexual contact.⁴

The recognition that the trajectory of the HIV epidemic in India is distinct from some African countries is no justification for complacency, because a 1% increase in the HIV prevalence in adults would result in an additional 5 million infected people. The annual budget for the National AIDS Control Programme has doubled over the past 3 years to Rs4700 billion in 2004–05. A 2002 pilot programme of offering antenatal counselling, testing, and antiretroviral treatment to prevent mother-to-child transmission in 11 sites has now been expanded to 225 antenatal clinics, and is the largest national antenatal screening programme in the world. A recently started programme to provide highly-active antiretroviral therapy to 100 000 HIV-infected patients in India is supported by a Rs2000 billion investment. A recently constituted National Parliamentary Forum has generated strong political support for additional HIV programmes, including a large school-based adolescent education programme and a national campaign to raise awareness about sexually transmitted diseases and treatments. Although more effort and resources are needed, the Indian Government's response reflects a sincere, intensive, and long-term commitment to effective HIV prevention and care. These efforts show that India is not complacent about the problem of HIV/AIDS. In fact, eradication of poliomyelitis and HIV/AIDS prevention are the most highly visible public-health programmes in India.

The accuracy of HIV-infection estimates and projections, based on seroprevalence data, limited surveillance coverage, and invalidated presumptions will always be considered questionable. With the same raw data collected by the governmental surveillance programme, different groups have produced widely varying estimates. HIV estimates could be enhanced by expansion of national surveillance and prevention programmes to reach vulnerable populations in rural and low-prevalence areas, as well as the addition of programmes designed to measure HIV incidence in population groups at risk. Although the

Increase in HIV infections in India is following an Indian rather than an African trajectory, the epidemic continues to demand a serious and sustained national commitment. India has many experienced, dedicated, and tireless governmental and non-governmental HIV-prevention and treatment advocates, health professionals, and researchers who will continue to ensure that this will not happen, and that the national response to the HIV epidemic will remain a top public-health priority.

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Targeting commercial sex-workers in Goa, India: time for a strategic rethink?

At 0700 h, June 14, 2004, bulldozers shattered our dream of an evidence-based participatory intervention for HIV prevention with sex-workers in Goa, India.⁵ Under the pretext of a High Court order to rehabilitate commercial sex-workers (CSWs), the government of Goa demolished the red-light area of Baira. The demolition occurred during the monsoon rains and the government provided no rehabilitation or relief for the thousands of people it rendered

homeless. A day's work demolished a decade of HIV prevention and made the newly homeless, destitute women even more vulnerable to HIV.

After a decade of HIV prevention efforts by non-governmental organisations (NGOs), CSWs regularly turned to peer educators and NGOs for condoms and treatment of sexually transmitted infections (STIs). The CSWs' active participation invigorated the HIV prevention programme.

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The authorities not only failed to appreciate these efforts, but they ignored us when we reported that confining of the red-light area before the demolition had forced women to seek clients elsewhere. Those women reported rape, multiple partners, reduced ability to negotiate condom use, increased violence, and police raids. Condom distribution fell significantly, probably increasing their vulnerability to HIV. The authorities also ignored reports who warned that destroying the red-light area would spread sex-work over a poorly defined area, isolating the CSWs and exposing them to violence and infection. As anticipated, the government's effort to eradicate prostitution has made it nearly impossible to provide HIV prevention services to CSWs.

Was the eviction a result of the government's anti-migrant ideology (most CSWs had migrated from other States—eg, Karnataka and Andhra Pradesh) or an anti-prostitution ideology? Or did the government evolve those sentiments to justify to the public an illegal and inhuman demolition? Motivation aside, it was startling that this event occurred in a country that boasts an internationally acclaimed model of success: the empowered and collectivised CSWs of Sonagachi.¹²

The demolition brought back vivid memories of the first author's involvement in HIV prevention efforts in Burma, where sex-work is illegal and the penalty of 10 years of hard labour almost invariably leads to death. There, our programme's access to clandestine brothels was sporadic, coverage was poor and the HIV epidemic was unchecked.

There is mounting evidence that intervening with CSWs prevents HIV spread. Using mathematical models, researchers have shown the effectiveness of targeting people with a high rate of sex-partner exchange in the early phases of an HIV epidemic.¹³ Investigators have also shown the effectiveness of various HIV prevention strategies in many

published experimental and quasi-experimental studies of sex-workers.¹⁴ A recent randomised trial found that rates of HIV dropped 400–500% in both study arms after women changed their HIV risk-taking habits.¹⁵ Thailand focused on sex-work in its countrywide intervention,¹⁶ and it is one of the few countries to see success in slowing the tide of HIV. Despite overwhelming evidence, only a handful of countries have implemented national interventions in the 10 years since the first reports were published about the successful programmes in Zaire.¹⁷

We must answer some fundamental questions in HIV prevention strategies. Can we continue to develop effective interventions and see them not used on a large scale because of political and legal barriers? The commercial interest vested in the intertwined tourist and sex industries might have prompted Thailand's success. Can public health afford to remain hostage to such political or economic whims? Is it ethical to collect data that blames the spread of HIV on people with a high rate of sex-partner exchange without implementing the resulting intervention? Our community advisory board's futile attempt to seek refuge in our research centre during the demolition exemplifies researchers' inability to protect participants in the face of governmental antagonism.

Instead of endlessly perfecting interventions in a tiny fraction of CSWs, HIV/STI prevention efforts must have unfettered access to all CSWs to succeed. To do that we must demand international political and legal standards to protect the human rights of sex-workers. These rights include the ability to self-organise and work without fear of violence and arrest, and access to HIV/STI care and prevention. Such rights might be established if access to HIV prevention and treatment funding becomes contingent on adherence to them.

Following this line of reasoning, clinicians, epidemiologists, and academics would be forced to venture into the enchanted territory of legislation for commercial sex. That would mean developing interventions that attend to such diverse issues as economics, migration, and gender inequalities, and their intersection with policy.¹⁸ Despite logistical difficulties, we must evaluate the effect on the HIV epidemic of interventions that address economic injustice and gender inequalities.¹⁹ Perhaps we can start with large-scale trials of the effect of changing policy on the spread of HIV in commercial sex.

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Smart bombs versus blunderbusses: high-dose chemotherapy for breast cancer

Perhaps no treatment in medical history had as meteoric a rise, or as humiliating a fall from grace, as high-dose chemotherapy for breast cancer. The concept was simple. Conventional-dose chemotherapy produced modest benefits for patients with metastatic or high-risk early-stage disease.¹ So perhaps very high doses would produce better results. Supportive laboratory data showed a meaningful dose-response relation for chemotherapeutic drugs, and advances in haematopoietic support technology—eg, marrow autografting—helped such dose escalation. The results of early non-randomised trials were encouraging. Complete remissions (some durable) were often reported, prompting speculation that high-dose chemotherapy might cure a few patients with metastases. In addition, up to 70% of patients who underwent such treatment after the discovery of heavy axillary involvement at primary surgery (a group with a very poor prognosis) achieved prolonged remission. However, the treatment was toxic (treatment-related death rates were as high as 10-20% in early studies), and, by the standards of the time, expensive. The replacement of marrow by support with peripheral blood progenitors resulted in reduced mortality, shortened stays in hospital, and reduced costs.

Understandably, desperate patients and their frustrated oncologists embraced this approach with enthusiasm, and advocacy of high-dose therapy assumed a strident quality. Carping oncologists and patients saw themselves as doing battle against cost-constraining bureaucrats, and usually won. High-dose chemotherapy rapidly and inappropriately became a new standard, not on the basis of data but on that of judicial opinion.² Soon, breast cancer was the most common indication for autografting in the USA.

Hulchli is, however, no substitute for data, as became apparent when reports of early randomised trials were uniformly negative.³ Although there were concerns with the design, power, and conduct of some of these trials, enthusi-

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Effectiveness of interventions for the prevention of HIV and other sexually transmitted infections in female sex workers in resource poor setting: a systematic review

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Summary

OBJECTIVE To systematically review the evidence for effectiveness of HIV and sexually transmitted infection (STI) prevention interventions in female sex workers in resource poor settings.

METHODS Published and unpublished studies were identified through electronic databases (Cochrane database, Medline, Embase, and Web of Science), hand searching and contacting experts. Randomized-controlled trials and quasi-experimental studies were included if they were conducted in female sex workers from low and middle income settings; if the exposure was described; if the outcome was externally measurable; if it was after the discovery of HIV, and if follow-up was longer than 6 months. A priori criteria were used to extract data. Meta-analysis was not performed due to the heterogeneity of studies.

RESULTS Twenty-eight interventions were included. Despite methodological limitations, the evidence suggested that combining sexual risk reduction, condom promotion and improved access to STI treatment reduces HIV and STI acquisition in sex workers receiving the intervention. Strong evidence that regular STI screening or periodic treatment of STIs confers additional protection against HIV was lacking. It appears that structural interventions, policy change or empowerment of sex workers, reduce the prevalence of STIs and HIV.

CONCLUSION Rigorous evaluation of HIV/STI prevention interventions in sex workers is challenging. There is some evidence for the efficacy of multi-component interventions, and/or structural interventions. The effect of these interventions on the wider population has rarely been evaluated.

Keywords HIV prevention, female sex workers, evaluation, resource poor settings, sexually transmitted infections, interventions

Introduction

The HIV epidemic continues to spread; 95% of the estimated 33 million people living with HIV reside in resource poor countries (UNAIDS 2007). Several systematic reviews have studied the effectiveness of HIV prevention strategies at both an individual and population level. One concluded that well designed condom promotion interventions targeting core-groups (groups with high rates of partner exchange) are effective (Merson *et al.* 2000). A Cochrane review of sexually transmitted infection (STI) control concluded that, with the exception of the trial of syndromic management of STIs in Myanmar (Croskettle *et al.* 1995), there is limited evidence from randomized controlled trials (RCT) for STI control as an effective HIV prevention strategy (Sengani *et al.* 2004). A systematic review of STI prevention interventions found that just over

half of 41 interventions identified were effective at reducing STIs (Manhart & Holmes 2005). Authors of a systematic review of structural facilitators and barriers to HIV prevention suggest the need to address macro-social determinants of risk, such as economic policy, migration, gender inequality and sex work legislation (Packer *et al.* 2000).

Mathematical models suggest that targeting core-groups, such as sex workers (SWs), is an effective way to reduce HIV transmission, particularly in the early and accelerated phase of the epidemic (Aral & Blanchard 2002; Boily *et al.* 2002). Given the scale of sex work, with incomes equivalent to 2–14% of Southeast Asia's gross domestic product (Lin 1998), there is an urgent need to identify which interventions are effective in reducing HIV in SWs.

Two important position papers have sought to summarize key strategies for HIV prevention in SWs. One approached HIV as an occupational hazard, advocating

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Two important position papers have sought to summarize key strategies for HIV prevention in SWs. One approached HIV as an occupational hazard, advocating

harm reduction strategies such as empowering SWs to use condoms and removing structural barriers to safety (Rekart 2005). The other examined strategies to provide STI treatment for SWs and concluded that, using presumptive periodic treatment (PPT) with single dose antibiotics, followed by regular algorithm-driven screening, was likely to be the most effective strategy (Stein & Dallabetta 2003). The effectiveness of either – harm reduction or STI treatment as an HIV prevention intervention – for SWs has not been systematically assessed. This paper presents the findings of a systematic review of the evidence for the effectiveness of HIV and STI prevention interventions, in female SWs, in resource poor settings.

Materials and methods

Inclusion criteria

Any intervention which intended to prevent HIV and STIs through targeting female SWs in resource poor settings, and which was evaluated in an experimental (RCT) or quasi-experimental (controlled but without randomly assigned control groups, or, time-series) study was eligible for inclusion. Study participants were limited to female SWs, defined as women who exchange sex for money or other gifts and commodities. Studies were only included if they reported at least one outcome measure that could be externally validated (Peterman *et al.* 2000; Zaslaman 2005). This included biological outcomes (HIV incidence and/or STI incidence/prevalence), or measurable health outcomes (e.g. condom disposal, health service utilisation). Studies were excluded if they targeted male and transgender SWs, were conducted prior to the advent of HIV, were based in rich industrial countries, if the focus was harm reduction for injection drug use (IDU), the intervention was not adequately described, or if the duration was less than 6 months.

Search strategy

Databases searched are listed in Table 1. Medline and Embase were searched using the Key Mesh terms and text

words (in *italics*): (*Prostitution OR prostitution* OR sex work**) AND (*HIV OR HIV infection OR HIV seroprevalence OR HIV OR sexually transmitted disease OR sexually transmitted infection*). The text words were used to search the other databases. A key non-indexed journal 'Research for Sex Work' (<http://www.researchforsexwork.org>) and references of review articles and selected studies were hand searched. Web sites of agencies involved in HIV-prevention (UNAIDS, Family Health International and Population Council) and conference abstracts (through Gateway, National Library of Medicine) were searched. First authors and experts in the field were contacted to obtain information on unpublished work, forthcoming manuscripts and research in progress. Unpublished studies and studies published in non-English languages journals were considered for inclusion.

Review methods

Titles and abstracts were entered into Reference Manager: Professional Version 10 (ISI ResearchSoft, Philadelphia, USA) and screened in three stages using a ten-item checklist (Figure 1). Data from studies that met the inclusion criteria were extracted using a data collection form. Heterogeneity of interventions precluded a summary statistic of effectiveness. Instead, the qualitative results were summarized in tables categorized by main intervention focus and outcome. The interventions are classified according to the conceptual framework presented in Figure 2. The order in which the studies are reported in the tables reflects methodological vigour.

Results

Intervention characteristics

Of 6788 articles and 1318 abstracts (including duplicates) identified across databases, 1272 were related to HIV and STIs in female SWs in resource poor settings. Hand-searching references and journals, searching websites and conferences and contact with experts identified a further 22 studies. The flow chart (Figure 1) shows that from the

Database	Years searched	Date last search performed	Number of articles identified
Cochrane controlled trial register and Cochrane database of systematic reviews	1998–2006	July 2006	41
Embase	1980–2006	June 2006	1912
Medline	1966–2006	June 2006	2175
Web of Science	1984–2006	July 2006	2660

Table 1 Databases and years searched

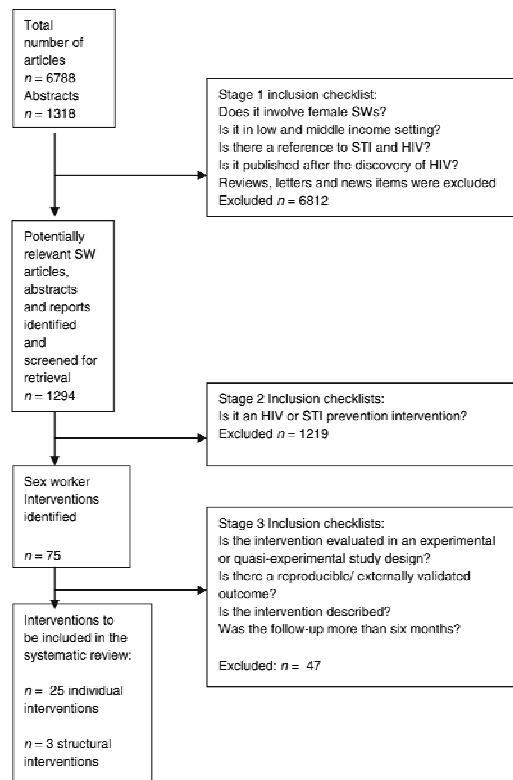


Figure 1 Flow chart: Selection of interventions for the systematic review.

relevant articles located, 26 published and two unpublished studies met the inclusion criteria.

Study populations

Twenty-five studies were conducted with SWs; one with couples (transactional and non-transactional sex partners) visiting a motel; two studied interventions with high-risk

women associated with mines and truck stops. Four studies evaluated the effect on clients.

Study settings

Sixteen (57%) of the studies were in Africa and the remainder were in Asia ($n = 8$) and Latin America ($n = 5$). Eleven (39%) were in dedicated SWs clinics; the remainder

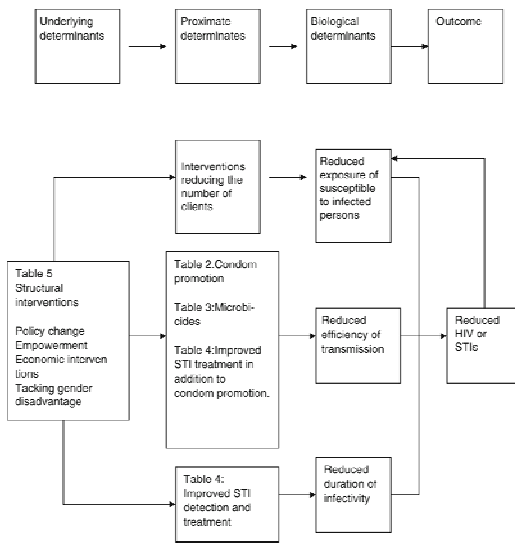


Figure 2 Conceptual framework for examining the interventions to prevent HIV and sexually transmitted infections in settings.

were conducted in hotels ($n = 7$), communities ($n = 7$), schools ($n = 1$) or truck stops ($n = 1$).

Study design

Eleven studies (39%) were RCTs, three of which were cluster-RCTs. Seventeen (61%) were quasi-experimental including uncontrolled before-and-after studies ($n = 11$), studies with a non-randomised control arm ($n = 3$), or a combination of both ($n = 3$).

Interventions evaluated

Seven studies (25%) evaluated interventions to increase condom use. Four (14%) evaluated the efficacy of the vaginal microbicide nonoxonyl-9 (N-9). Fourteen (50%) evaluated a combination of a behavioural intervention and STI treatment, six of which were able to separate out the effectiveness of adding the STI treatment component. Three (11%) structural interventions were multifaceted, with improved STI care and an enabling atmosphere for

risk reduction either through community mobilisation or political/legal sanction.

Outcomes

Twenty-six (93%) studies assessed changes in incidents or prevalent HIV or STIs, of which 12 measured HIV incidence. Other outcomes were verifiable measures of condom use such as provision, disposal or use with simulated clients ($n = 4$), and service utilisation ($n = 2$).

Summary of findings

There were only two RCTs which examined the effect of behavioural interventions combined with condom promotion (Table 2). In Madagascar, the addition of clinic based risk-reduction counselling to community based peer-counselling reduced incident STIs corresponding to increased self-reported condom use (Pelabara *et al.* 2005). An RCT in Nicaragua found that condoms placed in the rooms or handed to clients were more likely to be used than if made

available at reception. Paradoxically, condoms were less likely to be used in the presence of educational material in the rooms (Egger *et al.* 2000).

Two non-random-cluster-CT looked at the impact of peer education and condom provision in brothel-based SWs in India (Bhawe *et al.* 1995) and Singapore (Archibald *et al.* 1994; Wong *et al.* 1998, 2004). They found reductions in incident HIV and STIs (India) and gonorrhoea (Singapore), which corresponded to increased condom use. Another non-random-cluster-CT compared three risk reduction sessions per 6 months to one and found a lower STI risk in the intervention arm that was not sustained over time (Ford *et al.* 2000a,b, 2002).

As for female controlled methods (Tables 2 and 3), one cluster-RCT with only 25% follow-up in Thailand (Fontana *et al.* 1998) and one longitudinal study in Madagascar (Hartzell Hoek *et al.* 2007) examined the effect of adding female condoms to ongoing programmes. Both found a shift to female condom use, which only corresponded to a decrease in STI prevalence in Madagascar. Four placebo-controlled-RCTs examined different doses of the vaginal microbicide N-9 delivered in a variety of ways (Kreiss *et al.* 1992; Riddley *et al.* 1998; Richardson *et al.* 2001; Van Damme *et al.* 2002). They showed either no effect or an increased risk of HIV.

Treatment of bacterial sexually transmitted infections combined with behavioural interventions

Three RCTs (Table 4) tested the effectiveness of different STI treatment strategies for SWs, in two of which the primary outcome was incident HIV. The groups in Nairobi (Fosck *et al.* 2000; Kaul *et al.* 2002, 2004) and Benin/Ghana (Lobbe *et al.* 2003) looked at the effect of PPT while the group in Cote d'Ivoire (Ghys *et al.* 2001) tested regular screening for STIs. Neither the Cote d'Ivoire nor the Nairobi studies found a difference in HIV incidence between the arms. In Cote d'Ivoire the follow-up was less than 50%. The study of PPT in Nairobi was the only one that reported significant reductions in bacterial STIs in the intervention arm.

A quasi-experimental study of PPT in South Africa found reductions in STIs in SWs after the introduction of the intervention and an inverse relationship between distance from intervention and genital ulcer disease in miners (Steen *et al.* 2000). Only one of three women were followed-up over the 9 months. An intervention in Nicaragua found that STI treatment vouchers, redeemable at quality approved clinics led to significant drops in STIs in the SWs. This intervention, which in effect provided presumptive treatment to half of the known SWs, showed more substantial reductions in prevalence of STIs if the rounds of voucher

distribution were less than 6 months apart (Borghesi *et al.* 2005; Coeter *et al.* 2005; McKay *et al.* 2006). A cluster-RCT of STI delivery systems found that high-risk women at truck-stops preferred dedicated outreach clinics to primary health care centres (Nyamaryakung'e *et al.* 1997).

Four cohort studies examined the effect of regular STI screening, peer education and condom promotion. In Zaire (Laga *et al.* 1994) and Nairobi (Ngugi *et al.* 1988, 1996) they examined the effect on incident HIV while in Peru (Sanchez *et al.* 2003) and China (Ma *et al.* 2002) the primary outcome was incident STIs. Only the Chinese cohort reported the loss to follow-up, which was 50%. All interventions showed an increase in self reported condom use that corresponded with a reduction in incident HIV and/or STIs.

Four studies from Cote d'Ivoire (Ghys *et al.* 2002), Benin (Alary *et al.* 2002), Bolivia (Levine *et al.* 1998) and South Africa (Williams *et al.* 2003) compared the situation before and after introducing similar combinations of peer education, condom promotion and regular STI care. In South Africa this was part of a larger intervention that also targeted miners and youth. Only Cote d'Ivoire and Bolivia reported their response rates, which were 98% and 80% respectively. Bacterial STI prevalence dropped in all sites except for South Africa where it paradoxically rose despite increased condom use.

Structural interventions

The best described structural intervention has been the Thai 100% condom programme (Hansenberg *et al.* 1994; Rojanapithayakorn & Hansenberg 1996; Visuvanattana *et al.* 1995; Table 5). The countrywide, government led project improved access to affordable STI treatment, and increased condom use through changing social norms and imposing sanctions on dissident sex work establishments. Although there is no control group, various indicators suggest an impact, namely increased condom supply, an 80% reduction in the five major STIs in men (Hansenberg *et al.* 1994), and a tenfold decrease in STI incidence in new military recruits (Nelson *et al.* 1996; Celentano *et al.* 1998). The same magnitude of effect could not be demonstrated in SWs (Kilbourne *et al.* 1998, 1999).

Another well-described structural intervention was the empowerment of SWs in the Sonagachi red-light area (Table 6). Politicised and empowered SWs created an environment conducive to condom use and improved STI care through collective bargaining with structures of power (police, brokers and brothel-owners). Again without a control arm, the impact of the intervention cannot be quantified; however, HIV prevalence among the SWs of Sonagachi remains in single figures compared with

Table 3. Behavioural interventions and condom promotion

Place Year	Study design (Outcome)	Population sample	Duration (Months and follow-ups %)	Intervention	Measures*
India 1991-1993 (Bhavo et al. 1995)	Cluster non-random - CT Incident HIV Syphilis Hep B Ag	N = 2 areas in red-light district n = 541 SW & 37 brothel owners	6 months 1/97%	(B) IEC, peer risk reduction counselling, condom promotion (C) No intervention	HIV incidence (I) 0.02/100 SW (C) 0.16/100 SW HIV incidence RR 0.22 (P = 0.002)
Sexually transmitted infection Madagascar 2001 (Friedman et al. 2005)	Single blind RCT Incident STIs	N = 1000 SW Stratified by city	6 months 1/90	(B) Clinic-based + community-based peer risk reduction counselling (C) Community-based counselling only	Aggregate STIs OR 0.7 (0.5-0.9) Contraception OR 0.7 (0.3-1.0) Chlamydia OR 0.7 (0.5-1.0) Trichomonas OR 0.8 (0.6-1.2)
India 1991-1993 (Bhavo et al. 1995)	Cluster non-random - CT Incident HIV Syphilis Hep B Ag	N = 2 areas in red-light district n = 541 SW & 37 brothel owners	6 months 1/97%	(D) IEC, peer risk reduction counselling, condom promotion (E) No intervention	Syphilis RR 0.36 (p 0.002) Hep B Ag RR 0.27 (0.001)
Singapore 1994-2002 (Awhithead et al. 1994; Wong et al. 1998; Wong et al. 2004)	Before and after study Contraception use	N = 2737 mid SW and 1986 new SW	8 years 100/60	(D) Peer risk reduction counselling, IEC material, and dispensation of condoms with high STI rates (E) None (each area mandatory STI screen)	Contraception reduced from >80-85/1000 women visits to <5/1000 women visits Contraception RR 0.11-0.17
Bali 1992-1994 (Foad et al. 2006; Ford et al. 2002)	Cluster non-random controlled trial STI incidence	N = 7 n = 1566 SWs	24 months 1/31% men over per 6 months	(F) Three risk reduction sessions in 6 months (G) One risk reduction session in 6 months (H) Peer counselling and condom promotion in both arms	Contraception OR 0.53 (0.33-0.82) Chlamydia OR 0.63 (0.40-0.99) Trichomonas OR 0.51 (0.46-1.01) STIs reduced in both arms and the difference between high and low effort areas declined over time.

Table 2 (Continued)

Place Year	Study design Outcome	Population Sample	Duration Recourse rate/follow-up (%)	Interventions	Results*†
Thailand, 1994-1997 (Panichas et al., 1998)	Cluster RCT Incidence STI	Recruited N = 71 Brothels n = 548 SWs	24 weeks 7/26	(I) Addition of female condoms (C) Male condom	Adjusted STI RR 0.76 (0.50-1.16) Female condom were used 12% of the time Adjusted STI RR CR 0.7 (0.58-0.86) Female condom accounting for 20% of the final condom use.
Madagascar 2001-2003 (Petraitis et al., 2007)	Before and after study Incidence STI	Research clinic N = 1200	18 months 7/42%	Addition of female condom to ongoing risk reduction counselling and male condom promotion	In recent Condition adjusted CR 1.3 (1.09-1.73) To compare Condition with CR 1.3 (1.03-1.6) Presence of IEC material Condition adjusted CR 1.19 (0.84-0.98)
Guatemala district Nizenzapa 1990 (Rogge et al., 2000)	Cluster RCT with Parallel design Used condoms obtained from rooms	N = 19 brothels n = 6463 couples	24 days per month 53/48%	A, [I,] Condoms were placed in the rooms [II,] Condoms were handed to couples as they requested [C] Condoms available on demand at reception B, [I] IEC supplied in rooms [C] No IEC in room	

SW, sex workers STI, sexually transmitted infection RCT, randomised controlled trial IEC, information and education campaigns I, intervention arms C, control arms CR, crude risk ratio RR, adjusted risk ratio IR, risk ratio with 95% CI, confidence interval
*Where possible RR are calculated from data presented in the papers. Unless otherwise stated RR and CR are the 95% confidence intervals.
†Numbers in brackets following OR and RR are the 95% confidence intervals.
‡Percentage of all the couples approached who agreed to participate/percentage of couples distributed that was received.

Table 2 Vaginal microbicides

Place Year	Study design Outcome	Participant Sample	Duration Response rate/ follow up (%)	Intervention	Results
Incident HIV Kenya, Côte d'Ivoire, South Africa & Thailand 1996–2000 (Van Damme et al. 2002) Cameroon 1994–1996 (Raddy et al. 1998)	Triple blind RCT Incident HIV	FTI elixirs and truck spray N = 763 SW	48 weeks 76/68	(I) 52.5 mg tenofovir-9 vaginal gel (C) identical placebo	HIV incidence ^{adjRR} 1.5 (1.0–2.2) HIV incidence ^{adjRR} 2.5 (2.1–3.2) HIV incidence RR 1.0 (0.7–1.5)
	Genital lesions Desable blind RCT Incident HIV	N = 1170 50%	21 months 65/73	(I) 70 mg nonoxonol-9 film (C) identical placebo	
	Genital lesions Un-blinded RCT Incident HIV	Research office N = 138 SWs	14–17 months 100/84	(I) 1000 mg nonoxonol-9 vaginal sponge (C) non-identical placebo	HIV incidence ^{adjRR} 1.6 (0.9–2.8) Genital lesions RR 3.2 (<i>P</i> < 0.001).
	Lesions Desable blind RCT Incident HIV	Research cohort N = 278	19 months 1/69	(I) 52.5 mg nonoxonol-9 gel (C) placebo	HIV incidence RR 0.75 (0.37–1.53)
Sexually transmitted infections Kenya, Côte d'Ivoire, South Africa & Thailand 1996–2000 (Van Damme et al. 2002) Cameroon 1994–1996 (Raddy et al. 1998)	Triple blind RCT Incident HIV	FTI elixirs and truck spray N = 763 SW	48 weeks 76/68	(I) 52.5 mg tenofovir-9 vaginal gel (C) identical placebo	Genital lesions ^{adjRR} 1.2 (0.9–1.6) Chlamydia ^{adjRR} 1.2 (0.9–1.6)
	Genital lesions Desable blind RCT Incident HIV	N = 1170 50%	21 months 65/73	(I) 70 mg nonoxonol-9 film (C) identical placebo	Genital lesions RR 1.1 (0.8–1.4) Chlamydia RR 0.9 (0.7–1.3)
	Genital lesions Un-blinded RCT Incident HIV	Research office N = 138 SWs	14–17 months 100/84	(I) 1000 mg nonoxonol-9 vaginal sponge (C) non-identical placebo	Genital lesions ^{adjRR} 0.5 (<i>P</i> < 0.001)
	Lesions Desable blind RCT Incident HIV	Research cohort N = 278	19 months 1/69	(I) 52.5 mg nonoxonol-9 gel (C) placebo	Genital lesions RR 1.8 (1.0–3.1) Chlamydia RR 1.4 (0.8–2.1) Trichomonas RR 0.9 (0.5–1.3)

SW, sex workers; FTI, sexually transmitted infection; RCT, randomized controlled trial; IHC, information and education campaign; I, intervention arms; C, control arms; OR, odds ratio; ^{adjRR}, adjusted odds ratio; RR, risk ratio; ^{adjRR}, adjusted risk ratio.

Table 4 STI seropositivity and seroconversion explained with condom penetration

Phase Year	Study design	Population Setting	Duration Response rate/follow-up (%)	Intervention	Results
Incident HIV Cote d'Ivoire 1994-1997 [Clyne et al. 2001]	RCT Incident HIV Incident STI	SW clinic N = 342	42 months 45/92	(I) Monthly genital examination, microscopy & treatment	HIV incidence (I) 3.3/100 PY (C) 8.5/100 PY (P = 0.5) HIV incidence RR 0.62 (0.5) HIV seroconversion in BCTH areas RR 0.42 (0.14-0.96). Women attending 80% of scheduled clinic visits less likely to seroconvert P = 0.04 HIV incidence (I) 9/100 PY & (C) 3.3/100 PY HIV incidence RR 1.2 (0.6-2.5)
				(C) Examination and treatment early when symptomatic	
				(C) Peer education & condom promotion both arms	
Kenya 1998-2002 [Samb et al. 2000a, Kaul et al. 2002, 2004]	Double blind placebo controlled RCT Incident HIV Incident STI	N = 466 SWs	969 person years 89/73	(I) Monthly seropositive treatment with 1 g azithromycin (C) Placebo (Peer education & condom promotion both arms)	HIV incidence rates dropped from 11.7/100 PY to 4.4/100 PY HIV incidence RR 0.4 (P 0.003) HIV incidence in irregular compared with regular clinic attendees RR 6.2 Regular condom use was associated with reduced incident HIV OR 0.34 (0.13-0.82) Condom use (I) 78%, (C) 64% and (C) 52%
				(I) Monthly seropositive treatment with 1 g azithromycin	
				(C) Peer education & condom promotion	
Zaire 1988-1991 [Lajoie et al. 1994]	Longitudinal cohort: Incident HIV Incident STI	Dedicated SW clinic N = 531	36 months 7/0	(I) Peer education, condom promotion, 6 monthly group risk reduction counselling, and individual counselling (C) No above without individual counselling (C) Recent records before any intervention (Intervention groups also received periodic STI screening or treatment when symptomatic)	No significant difference between STI incidence
				(I) Peer education, condom promotion, 6 monthly group risk reduction counselling, and individual counselling	
				(C) No above without individual counselling	
Kenya 1985-1986 [Njogu et al. 1988, 1990]	Longitudinal cohort & Cohort (1985) N = 195; Non-random CT (11) N = 91 SW Incident HIV (12) N = 67 SW Incident STI (C) New seropositive (1986) N = 203	N = 466 SWs	1-23 months 7/7	(I) Monthly genital examination, microscopy & treatment (C) Examination and treatment early when symptomatic (Peer education & condom promotion both arms)	No significant difference between STI incidence
				(I) Monthly genital examination, microscopy & treatment	
				(C) Examination and treatment early when symptomatic	

Table 4 (Continued)

Place Year	Study design Outcome	Population Setting	Duration Response rate/follow-up (%)	Interventions	Results
Kenya 1994-2002 (Frank et al. 2000, Kasli et al. 2002, 2004)	Double blind placebo controlled RCT Incident HIV	N = 466 SWs	969 person years 88/73	(D) Monthly presumptive treatment with 1 g zalcitabine (Z) Placebo (Peer education & condom promotion both arms)	Contraception RR 0.44 (0.31-0.61) Chlamydia RR 0.38 (0.26 to 0.57) Trichomonas RR 0.56 (0.40-0.78) No significant reduction in the incidence of syphilis Contraception RR 0.28 (P = 0.39) Chlamydia RR 1.9 (P = 0.27) No significant difference in STI incidence in clients There was a drop in gonorrhoea in both groups after treatment.
Kenya and Ghana 2001-2002 (Tabbo et al. 2003)	Double blind placebo controlled RCT Incident STI	18 clinics N = 206 clients N = 252 SW, N = 1073 clients Individual randomisation N = 141 SW	9 months 1/80	(E) Presumptive periodic treatment with zalcitabine 1 g five times a day Ciprofloxacin 500 mg given once and then twice, Cycle repeated (C) placebo (Peer education & condom promotion both arms)	Contraception RR 0.44 (P < 0.001) Chlamydia RR 0.17 (P < 0.001) Mucosa Gonorrhoea & Chlamydia RR 0.6 (P < 0.001) Gonorrhoea RR 0.23 (P < 0.001) Increase in condom use with zalcitabine plus client with a genital ulcer and decrease in seroprevalence (P for trend 0.002)
South Africa 1996-1997 (Speer et al. 2000)	Before and after study of SWs and urban Non-random control group design from intervention Prevalence of STIs	Mabala SW clinic N = 407 SWs N = 608 & N = 928 clients	9 months 1/32	(F) Monthly presumptive periodic treatment 1 g zalcitabine to SWs (Condom negotiation & IRC)	Contraception RR 0.44 (P < 0.001) Gonorrhoea RR 0.17 (P < 0.001) Mucosa Gonorrhoea & Chlamydia RR 0.6 (P < 0.001) Gonorrhoea RR 0.23 (P < 0.001) Increase in condom use with zalcitabine plus client with a genital ulcer and decrease in seroprevalence (P for trend 0.002)
Nigeria 1995-2004 (Bohali et al. 2005, Gertzel et al. 2005, Mckay et al. 2006)	Observational study of five truck repair sites, sex-stable service provision STI prevalence	Community based N = 1500 SW	9 years 50% seroprevalence 1/10	(D) 50000 regulars distributed for free STI treatment at designated clinics. The package consists of presumptive treatment with zalcitabine 1 g, screening for syphilis, trichomonas, gonorrhoea, bacterial vaginosis and cervical cytology	Annual drop Gonorrhoea (5%), Trichomonas (5%), & syphilis (16%) Optimal gap for vaccine distribution at months

Table 4 (Continued)

Place Year	Study design Outcome	Population Setting	Duration Response time/follow-up (%)	Intervention	Results
Zaire 1986-1991 (Laga <i>et al.</i> 1994)	Longitudinal cohort incident HIV incident STI	Dedicated SW clinic N = 531	36 months 1/1	Monthly STD screen & treat; 2 monthly voluntary counselling and HIV testing & risk reduction counselling Peer education & condom promotion (1) Peer education, condom promotion, 6 weekly group risk reduction counselling, and individual counselling. (2) As above without individual counselling. (3) Repeat visits before any intervention (intervention groups also received periodic STI screening or serostatus when symptomatic) Risk reduction counselling, condom promotion and monthly STI screen and treat	Incidence of all STI's except chlamydia decreases over 3 years ($P < 0.01$)
Kenya 1985-1986 (Pitso <i>et al.</i> 1988, 1990)	Longitudinal cohort & Non-random CT incident HIV incident STI	Cohort (1985) N = 955; (1.1) N = 91 SW (1.2) N = 67 SW (1986) N = 295	1-23 months 1/1	Peer education, condom promotion, 6 weekly group risk reduction counselling, and individual counselling. (2) As above without individual counselling. (3) Repeat visits before any intervention (intervention groups also received periodic STI screening or serostatus when symptomatic) Risk reduction counselling, condom promotion and monthly STI screen and treat	Annual gonorrhoea rate women RR 0.23 ($P < 0.001$) Decline in men attending STI clinic in intervention site compared to non-intervention site ($P < 0.001$)
Peru 1994-1997 (Serdan <i>et al.</i> 2003)	Longitudinal cohort incident STI	N = 917 SW	22 months 95/7	Risk reduction counselling 2 monthly STI screen and treat	Chlamydia ^a OR 0.47 (0.28-0.79) Gonorrhoea ^a OR 1.16 (0.61-2.3) Trichomonas ^a OR 0.19 (0.09-0.37) Gonorrhoea RR 0.3 (0.11-0.75) Trichomonas RR 0.14 (0.04-0.45) Chlamydia RR 0.24 (0.14-0.4)
China 1996-1999 (Ma <i>et al.</i> 2002)	Longitudinal cohort incident STI	N = 966	6 months 1/53	Peer education & IBC & condom promotion Voluntary counselling and HIV testing & STI care Peer education & IBC & condom promotion Monthly STI screen & treat	Gonorrhoea RR 0.3 ($P < 0.001$) Syphilis RR 0.1 ($P < 0.001$) AIDS ^a OR 0.24 (0.09-0.56) Gonorrhoea ^a OR 0.47 (0.38-0.65)
Cote d'Ivoire 1991-1997 (Gips <i>et al.</i> 2002)	Before & after repeat cross-sections HIV Prevalence STI Prevalence	Community based N = 5218	6 years 50/na	Peer education & IBC & condom promotion Voluntary counselling and HIV testing & STI care Peer education & IBC & condom promotion Monthly STI screen & treat	Gonorrhoea RR 0.3 ($P < 0.001$) Syphilis RR 0.1 ($P < 0.001$) AIDS ^a OR 0.24 (0.09-0.56) Gonorrhoea ^a OR 0.47 (0.38-0.65)
Bhutan 1993-1999 (Alley <i>et al.</i> 2002)	Before & after repeat cross-sections HIV Prevalence STI Prevalence	N = 374 N = 365 N = 591	6 years 1/na	Peer education & IBC & condom promotion Monthly STI screen & treat	Gonorrhoea RR 0.3 ($P < 0.001$) Syphilis RR 0.1 ($P < 0.001$) AIDS ^a OR 0.24 (0.09-0.56) Gonorrhoea ^a OR 0.47 (0.38-0.65)

Table 4 (Continued)

Place Year	Study design Outcome	Population Setting	Duration Response rate/follow-up (%)	Intervention	Results
Bahria, 1992-1994 (Lofgren <i>et al.</i> , 1996)	Before & after Repeat cross-sections STI prevalence	Prostitution based N = 508	3 years 100%	Periodic STI screen & treat Condom promotion Clinic based individual counselling Out reach workers Community level Intervention from SW, Mitz workers & youth, Condom promotion (with health care workers in syndicate STI management) Monthly prophylactic prescriptions with antibiotogram	Gonorrhoea RR 0.6 (<i>P</i> < 0.001) Syphilis RR 0.4 (0.02) Genital ulcer disease RR 0.1 (<i>P</i> < 0.006) MFWs Chlamydia =OR 4.23 (<i>P</i> < 0.001), Gonorrhoea 2.51 (<i>P</i> < 0.001), Syphilis (RPR) 1.57 (<i>P</i> = 0.02) Men Chlamydia =4 OR 3.34 (<i>P</i> < 0.001) Women Chlamydia =11 OR 1.88 (<i>P</i> < 0.001) Syphilis =1OR 2.06 (<i>P</i> < 0.001) Condom distribution increased three fold
South Africa 1996-2000 (Williams <i>et al.</i> , 2003)	Before & after cross-sections STI prevalence	SW N = 121 & N = 83 Stratified random sample of men, women & minors N = 189 & N = 769	3 years 75%	Different STI treatment delivery: (1) Primary Health Care workers led outreach clinic visits per week (2) Primary Health Clinic with STI drugs (3) Outreach but outreach clinic every 3 months (4) Primary Health clinic without STI drugs (standard of care)	Interventions (1) 1.43 vs/standard Interventions (2) 1 vs/standard Interventions (3) 1.23 vs/standard Control 0.4 visits/woman
Service upgrade Tanzania 1993-1994 (Nyarumbezi <i>et al.</i> , 1997)	Cluster RCT Service affiliation	N = 7 truck stops n = 330 high risk women	12 months 75%		

SW, sex workers; STI, sexually transmitted infections; RCT, randomised controlled trial; RR, risk ratio; =OR, adjusted risk ratio; P, adjusted risk ratio.

Table 8 Structural interventions (Thailand)

Country, Year	Primary intervention	Study population	Study design	Outcome variables	Results
Thailand (Hoenberg et al. 1994), Ratanakphrayan & Hoenberg 1996), 1989-1994	100% condom program Government led supply of condoms to SW establishments Sanctions for brothels fail to adhere to 100% condom Large scale media campaign targeting male clients to use condoms with SW. Increased number of STI clinics Free weekly STI tests for SW	County wide	HIV surveillance data from blood donors, pregnant women, SWs, male STI clinic attendees, 21-year-old army conscripts Random on the SW establishments from male STI clinic attendees and annual field surveys STI data from STI clinics and hospital out patients Condoms purchased by the government and distributed Condoms sold to vendors Before and after %-uptake Participation in intervention Before and after behaviour data Ratio of untreated clients w/o condom	Condom use in commercial sex establishment increased from 14 to 94%. Condoms supplied Condoms for 70% of SW clients for 50% (1992) Five major STDs decreased by 79% in men	
Thailand (Vitaravorn et al. 1995) 1985-1992	Pilot for 100% condom program Supranat peer-educator Condom promotion Model brothel Encourage peer pressure amongst brothel owners Supply free condoms Cost benefit for brothel owners	500 brothel based sex workers in Chiang Mai	Comparing two Cohorts sex assembly surveys HIV incidence STD incidence Sexual behaviour	Participation up to 100% of identified female SWs No decline in clients or net income Before intervention 40% reduced sex without condom After 50% reduced stimulated client after 2 months and around 80% after one year	
Thailand (Solano et al. 1996) Chertanan et al. 1998) 1991-1995	100% condom program 100% condom program STD treatment at baseline Incident STDs treated	2417 and 1669 military conscripts in the south of Thailand (random 19-43 year olds as selected by lottery) 90% contraceptive penetration in the analysis 70% followed up 24 months	Cohort study - before and after intervention HIV incidence STD incidence	10 fold decrease in STD incidence between 1991 before and 1992 cohort from 17/1000 yr to 1.6/1000 yr ($P < 0.0001$) HIV incidence from 2.48/1000 yr to 0.55/1000 yr RR 0.22 ($P < 0.0001$) Brothel visits down from half to 1/3 Inequalities condom use with SWs down from 14% to 2.5% ($P < 0.0001$) aOR for incident HIV brothel based c.f. non-brothel based 7.3 (CI 2.5 to 21.9) ($P < 0.01$) Brothel based higher HIV incidence throughout	
Thailand (Kirima et al. 1998, 1999) 1991-1994	100% condom use program;	Brothel based female sex workers over 16 and The estimate N = 500 14% loss to FU			

SW, sex worker; aOR, adjusted risk ratio; STD, sexually transmitted infection.

Table 4 Sexual interventions (Saugachi)

Country, Year	Primary intervention	Study population	Study design	Results
India, Calcutta (Chakrabarty <i>et al.</i> , 1994; Das <i>et al.</i> , 1994; Jais <i>et al.</i> , 1994, 1998, 2004; Pal <i>et al.</i> , 1994; Jais & Singh 1995), 1991-2000	Saugachi (red-light area wide) project: (i) Homevisits through self-organization of SWs (ii) Defolting and seeking needs, help, advice, child immunization, literacy and HIV prevention (iii) Collective bargaining with police, barbers and brothel owners in HIV prevention (iv) Condom promotion (v) Improved STI treatment (vi) AA clubs (vii) Condom promotion & IRC & peer education	Women living in Saugachi	Cross-sectional surveys Surveillance data for STIs and HIV	Collective response of 100 SWs HIV prevalence in SWs has remained at <10% which is close to world low level (8%) elsewhere in India, e.g. Mumbai. Since 1992, drop in Transmission Risk Index Seroprevalence survey (TPHA) from 63.8% to 17% ($P = 0.002$) and prevalence 12 to 5% ($P < 0.001$)
Saugachi vs. NACD (Gangadharay <i>et al.</i> , 2003), 2003		(i) Sexified random sample of 200 brothel based SW in Saugachi N = 173 (87% response rate) (ii) All SW from neighboring area N = 169 (65% response rate)	Non-random CT Diagnose measures Behaviour risk & combined clinical and laboratory diagnosis of STIs	Significant baseline difference between intervention and control arms Saugachi women had significantly better health seeking behaviour and optimism scores No difference in baseline STIs.

SW, sex worker; CT, sexually transmitted infection; IRC, information and referral campaign; I, intervention arm; C, control arm; OR, odds ratio; CI, 95% adjusted odds ratio; RR, adjusted risk ratio.

prevalences of over 50% reported from similar settings elsewhere in India. A three- to fivefold reduction in prevalent STIs was documented (Chakraborty *et al.* 1994; Das *et al.* 1994; Jana *et al.* 1994, 1998, 2004; Pal *et al.* 1994; Jana & Singh 1995). There has been one quasi-experimental study comparing Sonagachi with neighbouring brothels; but marked baseline differences, particularly higher client numbers in Sonagachi, limit interpretation of the finding of no difference in SII prevalence (Gangopadhyay *et al.* 2005).

There has been one controlled study of a structural intervention combining elements from both the group empowerment model of Sonagachi and the political sanctions of Thailand (Table 7). The study, conducted in 68 brothels in two cities in the Dominican Republic, compared the addition of regional policy change, which penalised the brothel management for failing to enforce 100% condom use, against an intervention that combined SW solidarity, environmental cues for condom use, improved STI care, and self-regulation of the brothels. There were greater reductions in STI prevalence and a corresponding increase in likelihood of rejecting unsafe sex in the city where the 100% condom use policy was in force. Condom use increased in individual SWs and was associated with reduced incident STIs in both arms of the study. However, the likelihood of a brothel adhering to the 100% condom use programme was 10% greater in the policy change area (Kerrigan *et al.* 2003, 2006).

Discussion

To the best of our knowledge, this is the first systematic review of HIV and STI prevention interventions in female SWs in resource poor countries. Although there were a considerable number of descriptive studies of sex work in resource poor settings, we only identified 28 that evaluated interventions with externally measurable outcomes. Less than half of these were RCTs, the robustness of which was compromised by very high attrition rates. We identified four broad categories of intervention: behavioural interventions with condom promotion, addition of vaginal microbicide, addition of STI treatment, and structural interventions. The small number of methodologically rigorous studies reflects the considerable challenges of studying this group. The diversity in type of intervention, study design, and outcome measures made calculation of a summary measure of effectiveness inappropriate.

What interventions worked?

Risk reduction counseling coupled with condom promotion reduced HIV or STI risk or increased condom use in all

the five studies that tested this hypothesis (Dhawe *et al.* 1995; Egger *et al.* 2000; Ford *et al.* 2003; Wong *et al.* 2004; Feldblum *et al.* 2005). Additional support for the effectiveness of condom promotion comes from observed reductions in HIV incidence in both arms of STI treatment RCTs (Ghys *et al.* 2001; Kaul *et al.* 2004) and the relationship between increases in self-reported condom use and reductions in infections in two of the cohorts (Nguji *et al.* 1988; Laga *et al.* 1994). Despite the methodological limitations of these studies, the consistency of the direction of change, the dose response, the association between participation in the intervention, self-reported condom use and reduced infection rates, and biological plausibility suggest that this is an effective strategy.

Two studies assessed female condom promotion and showed an increase in female condom uptake (Fonstater *et al.* 1998; Hatzell, Hoke *et al.* 2007). There is only weak evidence from the before and after study of related reductions in STI incidence (Hatzell, Hoke *et al.* 2007). N-9 did not reduce HIV incidence and a meta-analysis of all N-9 studies found a relative risk for HIV of 1.12; CI 0.88–1.42 (Wilkinson *et al.* 2002). Trials of other microbicides are under way.

The two RCTs of PPT and regular screening of STIs were unable to prove the hypothesis that STI treatment in SWs will reduce HIV acquisition (Ghys *et al.* 2001; Kaul *et al.* 2004). The failure of two of the RCTs to show an effect of presumptive treatment or regular screening on STI rates may be explained by a type 2 error (loss of power from sizeable reductions in STI rates in the control as well as intervention arms) (Ghys *et al.* 2001; Labbe *et al.* 2003). The RCT that did show an effect of presumptive treatment on STI rates detected this sample size problem and lengthened the enrolment period accordingly (Kaul *et al.* 2002, 2004).

One quasi-experimental study suggests that increasing the interval between rounds of PPT may lessen its impact on STI prevalence (Genter *et al.* 2005). Other studies also suggest that the effect of presumptive treatment is short lived (Debits *et al.* 2005; Cowan *et al.* 2005a). The effectiveness of the Nicaraguan voucher system in enabling nearly half of the SWs countrywide to access STI health services (Genter *et al.* 2005) and the preference for outreach services in truck-stops (Nyamuyehung'o *et al.* 1997) suggests that innovative outreach services may improve the coverage of dispersed and clandestine SWs.

100% condom use programme was a countrywide multi-component intervention that sought to increase condom use, reduce the number of commercial sexual encounters and improve provision for STI treatment. It is impossible to disentangle the relative importance of the different components of the intervention from each other, or secular

Table 7 Structural interventions (Dominican Republic)

Country Year	Primary intervention	Study population	Study design	Results
Dominican Republic (Kawachi <i>et al.</i> , 2006) 1999-2000	(C) Ratched-based interventions (1) Solidarity through regular meetings between SWs & management (2) Environmental exit for condoms (3) Increased clinical care through liaison & training for the government's mandatory family STI screen (4) Monitoring and reporting the performance at the hospital (5) In addition to 1-4 above: regional policy made carbon use between efforts and SWs mandatory & implementation the local owners and management's responsibility. This policy was enforced through a release of support and sanctions.	(C) Santa Domingo (54 hospitals) (D) Puerto Plata (54 hospitals) Participatory observation at all hospitals Cross-sectional survey before and after interventions in 2000 SWs per city transferred from the mandatory government STI clinic-only clinic SW on a designated day Response rate 8.7%.	Before and after X-sectional studies Non-random comparison: STI Condom use Rejection of condoms Without STIs per month Response to intervention	Decrease in STIs was only significant in intervention arm (D) ^{adj}OR 0.57, CI 0.32 to 0.78 (C) ^{adj}OR 0.60, CI 0.35 to 1.03 (3) increased proportion of hospitals with no new STIs OR 1.20, CI 1.11 to 1.31 (4) increased rejection of condoms ^{adj}OR 3.84, CI 1.84 to 7.58 Observed difference in the intervention was significantly associated with reduced STIs ^{adj}OR 0.56, CI 0.36 to 0.78 Adjustment increased at an individual level in both arms ($P < 0.001$) Adjustment as an establishment level only increased in intervention arm ^{adj}OR 1.4, CI 1.11 to 1.7

SW, sex workers; STI, sexually transmitted infection; ICT, randomized controlled trials; IFC, information and education campaigns; I, intervention arms; C, control arm; OR, odds ratio; ^{adj}OR , adjusted odds ratio; RR, risk ratio; ^{adj}RR , adjusted risk ratio.

trends. The observational data from the Sonagachi Project suggest that empowering SWs may reduce their HIV and STI risk. However, the reproducibility of this approach remains unproven (Basu *et al.* 2004). The Dominican Republic attempt to disentangle the relative effects of policy and empowerment suggests that while pressure to create 'model brothels' through self-regulation resulted in a decrease in STIs, there was a greater effect in the city where the 'model brothel' was enforced through policy (Kerrigan *et al.* 2003).

Potential biases of the review process

Given the heterogeneity of the study designs, a funnel plot for publication bias was not done; however there is likely to be publication bias. While some RCTs were unable to show an effect, almost all quasi-experimental studies reported statistically significant findings in favour of the intervention being tested.

Interventions not published in peer reviewed journals are under-represented (Hopewell *et al.* 2007). Even within the grey literature there is potential for selection bias, as interventions funded or sanctioned by the larger donors are more likely to be accessed through UNAIDS, FHI or Population Council reports and best practice publications. As in all systematic reviews, despite extensive hand searching, there is still the possibility of indexing bias (Hopewell *et al.* 2002).

The review was restricted to evaluated interventions that had externally validatable outcome measures of effectiveness. This may have excluded less rigorously evaluated but nevertheless important and potentially effective interventions (Wilson *et al.* 1990; Chitfalacka 1993; Asanorah-Adix *et al.* 1994; Nzieme 1999; Ganasinghe 2000; Campbell & Mzalidume 2001). However, self reported measures of, for example, condom use are unreliable and were therefore excluded from this review (Peterman *et al.* 2000; Zaslman 2005).

A limitation of this systematic review is that only interventions that involved women who exchange sex for gifts or money could be included. This means that potentially effective interventions with high risk women such as bar workers, who were not explicit about the transactional nature of their sexual behaviour, were excluded (Riedner *et al.* 2006).

Potential biases of the studies and other methodological issues

Properly conducted RCTs are the best way of assessing the effectiveness of health care interventions. In this review, fewer than half of the studies were RCTs and only just over

half had any controls. The effect size of the quasi-experimental studies is greater than the RCTs, and several RCTs showed no effect.

Studies primarily targeted professional SWs working in brothels or red-light districts. In reality much sex work takes place in less organised settings, which would affect the broader applicability of the findings. Forty percent of the studies recruited participants from an STI clinic that had been specifically established for SWs. Participants in a disease prevention intervention may not be representative of all SWs; they may be more adherent, more visible and more likely to have received HIV prevention information. This may lead to participation bias. Analysis of the Kenyan cohort as an open cohort found a drop in incidence of HIV over time, which the investigators attribute to secular trends and the cohort attracting lower risk SWs with the passage of time (Baeten *et al.* 2000). In addition, half of new HIV infections occurred within the first 6 months of joining the cohort, and 75% occurred within the first year (Baeten *et al.* 2000), which may reflect the selection of higher risk individuals early in the cohort's life (Beyrer *et al.* 1996). These are alternative explanations for the drop in HIV incidence, detected in two of the cohorts, after introducing the interventions (Ngugi *et al.* 1988; Laga *et al.* 1994).

Sex workers are highly mobile. Over half of the studies that followed SWs reported attrition rates as high as 75%. This compromises the validity of the resultant outcome (Beyrer *et al.* 1996; Beyrer & Nelson 1997). In one cohort, if all the women lost to follow-up were non-compliant, the 50% increase in condom use reported would be a more modest 10% (Ma *et al.* 2002).

To minimise recall and social desirability bias, only studies with reproducible outcomes were included (Peterman *et al.* 2000; Zaslman 2005). However, for a study to be powered to detect change subsequent to an intervention there needs to be a low baseline prevalence and high incidence of the outcome of choice. In at least three RCTs, the lower than expected infection rates after enrolment may have resulted in a type 2 error contributing to the lack of effect found (Ghys *et al.* 2001; Labbe *et al.* 2003; Karil *et al.* 2004).

The HIV prevention in SWs is a case group intervention, STIs are a communicable disease and any intervention to reduce STIs may have a herd effect. Thus, any evaluation of STI and HIV prevention should also consider impact at a population level. None of these studies looked at HIV incidence in the bridge or general population, and only one out of the four studies that measured the effect of the intervention on STIs in clients found an effect.

Sex workers are a heterogeneous group. Factors such as relative number of the SWs in relation to the bridge and

general population, as well as the structure of the sexual networks and stage of the epidemic influence the extent to which they behave as a 'core' group (Lewndes *et al.* 2002; Cowan *et al.* 2005; Nagot *et al.* 2005). Given the small number of effective studies, we were unable to explore the relationship between phase of the epidemic and effectiveness of the intervention.

Given the complexity and multifaceted nature of these interventions, indicators of exposure to the intervention would have assisted interpretation. Unfortunately the indicators to measure exposure commonly reported, e.g. number of clinic visits or educational events attended, are also measures of adherence. In the absence of controls, finding an association between these measures of exposure and outcomes may be confounded by other factors associated with being an 'adherent' participant in disease prevention. Data collection methods can behave as interventions, e.g. behavioural questionnaires could reinforce the behaviour message or social desirability bias. Equally, legally imposed 'model brothels' may encourage managers to implement additional, undocumented, interventions.

Few of the cluster-controlled trials accounted for inter-cluster correlation in either the power calculation or in the analysis stage. This could result in a greater measure of effect than if clustering had been considered (Hayes *et al.* 2006). In three studies, only two areas were compared, so we cannot exclude residual confounding or chance (Bhawe *et al.* 1995; Wong *et al.* 1998; Kerrigan *et al.* 2006).

Conclusions

The methodological challenges to conducting studies in such a clandestine and mobile group suggest that caution should be exercised when interpreting the results. None of the RCTs showed an impact on HIV incidence. However, the observational data suggests that there is some evidence for the effectiveness of risk reduction counselling and condom promotion.

There is evidence that condom promotion and regular access to improved STI management reduces STI burden in SWs. There's no unequivocal evidence that intensive STI management in SWs has any additional benefit in HIV prevention. Innovative STI delivery methods, such as vouchers, may improve coverage.

There is some evidence that policy support for SW interventions as well as strategies that empower the women improve coverage, acceptability and adherence to the intervention. There is still uncertainty around the efficacy of STI treatment in HIV prevention for SWs, what is the best STI treatment strategy, what components of structural interventions work, and what the potential negative

ramifications of targeting SWs are (e.g. stigma, violence, and driving sex work underground or into areas less identified with 'professional' sex work, such as bars and dance halls). In addition, there is limited data available on the wider public health benefits of targeting SWs. There is a need to explore the effectiveness of comprehensive HIV care packages for SWs, new microbicides, HSV-2 prophylaxis and pre-exposure prophylaxis. Evaluations of interventions that reach community-based SWs who work outside brothel-based settings and red-light districts are required.

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The burden and determinants of HIV and sexually transmitted infections in a population-based sample of female sex workers in Goa, India

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ABSTRACT

Background: Interventions targeting sex workers are central to the National AIDS Control programme of India's third 5-year plan. Understanding the way in which societal and individual factors interact to shape sex workers' vulnerability would better inform interventions.

Methods: 326 female sex workers, recruited throughout Goa using respondent-driven sampling, completed interviewer-administered questionnaires. Biological samples were tested for *Trichomonas vaginalis*, *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and antitoxins to herpes simplex virus type 2 (HSV-2) and HIV. Multivariate analysis was used to define the determinants of HIV infection and any bacterial sexually transmitted infection (STI).

Results: Infections were common, with 25.7% prevalence of HIV and 22.5% prevalence of bacterial STI; chlamydia 7.3%, gonorrhoea 8.8% and trichomonas 8.4%. Antitoxins to HSV-2 were detected in 57.2% of women. STI were independently associated with factors reflecting gender disadvantage and disadvantage, namely young age, lack of schooling, no financial autonomy, deliberate self-harm, sexual abuse and sex work-related factors, such as having regular customers and working on the streets. Other factors associated with STI were Goan ethnicity, not having an intimate partner and being asymptomatic. Having knowledge about HIV and access to free STI services were associated with a lower likelihood of STI. HIV was independently associated with being Hindu, recent migration in Goa, lodge or toilet-based sex work, genital ulcer disease and dysuria.

Conclusion: Sex workers working in medium prevalence states of India are highly vulnerable to HIV and STI and need to be explicitly incorporated into existing interventions. Structural and gender-based determinants of HIV and STI are integral to HIV prevention strategies.

1 The HIV epidemic in India, the world's second most populous country, is of global importance.¹ Targeting core groups, such as sex workers, is pivotal to HIV prevention in India.² The National AIDS Control Organisation estimates 0.6–0.7% of the adult female urban population is engaged in transactional sex.³ The National AIDS Control Programme's third 5-year plan calls for 100% coverage of sex workers through community mobilisation.⁴ Data on this heterogeneous group remain patchy,^{5,6} however, and outside of India's six high-prevalence states, coverage of these at-risk populations is suboptimal.⁷

Individual behavioural change and changing sociocultural norms have been advocated as strategies to reduce sex workers' vulnerability to HIV

and sexually transmitted infections (STI).⁷ The manner in which individual, community and societal factors interact to shape this vulnerability⁸ in different epidemiological contexts⁹ needs to be better understood.

Goa is a small state with a concentrated HIV epidemic.⁹ As an annual destination for more than 1.5 million tourists and the accompanying seasonal migrants,¹⁰ its epidemiological importance outweighs its size. Nonetheless, there is a dearth of data on the size of high-risk groups such as sex workers, the epidemiology of HIV and STI, and how individual and structural factors interact to shape vulnerability to HIV.¹¹

Here we describe the determinants of STI and HIV in a population-based sample of sex workers in Goa, following the demolition of the red-light area. In particular we explore the relationship between the underlying social and the proximal behavioural and sex work factors.

METHODS

Study setting

The study was set in Goa, a small coastal state with a population of 1.57 million.¹² In June 2004 the demolition of Borda, Goa's main red-light area, ended the dominance of homogeneous brothel-based sex work in Goa.¹³ The study was conducted throughout Goa in collaboration with Positive People, the largest and most experienced HIV organisation in Goa. Recruitment took place from December 2004 to December 2005.

Study population

Sex workers were defined as women who provide sexual services in exchange for goods or money.

Sampling method

The sex workers in the survey were recruited using respondent-driven sampling (RDS).¹⁴ This variant of chain sampling delves deeper into the hidden networks by rationing the number of recruits per respondent, increasing the number of waves of recruitment and providing financial incentives to the 'recruiter'. The probability of recruitment is calculated from network size and relationships.¹⁵

Ten researchers spent over 5000 h of participant observation and ethnographic mapping throughout the urban centres and coastal tourist belt of Goa. They identified the different settings and categories of sex work. The initial recruits (seeds) were purposively selected from various sex work typologies, ethnicities, ages and areas of Goa. They were given vouchers with unique numbers, which

Original article

Table 1 Demographic and psychosocial characteristics of female sex workers in Goa

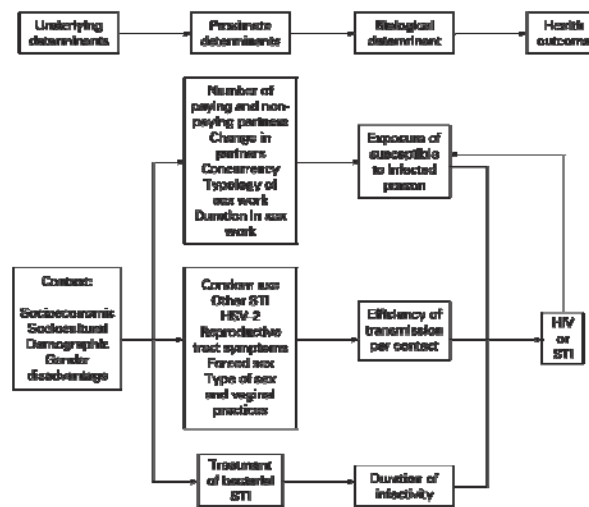
Variable	Number (n = 328)	Weighted percentage, % (95% CI)
Age, years		
<20	35	8.7 (6.2 to 12.2)
21–25	100	29.0 (24.2 to 34.2)
26–30	79	25.7 (21.8 to 31.0)
31–35	43	13.8 (10.3 to 18.2)
36–40	40	13 (9.6 to 17.4)
>40	29	9.9 (6.9 to 14.0)
Ethnicity		
Goa	54	11.2 (8.8 to 14.5)
Karnataka	200	71.7 (66.9 to 76.1)
Andhra Pradesh	37	9.9 (7.2 to 13.4)
Other	35	7.2 (5.1 to 10.0)
Religion		
Hindu	222	72.3 (67.2 to 76.9)
Christian	41	10 (7.4 to 13.5)
Muslim	50	17.1 (13.4 to 21.6)
Other	2	0.6 (0.1 to 2.3)
Unable to read or write	255	82.1 (77.6 to 85.8)
Schooling		
None	198	67.1 (61.9 to 72.0)
Incomplete	117	30.9 (26.1 to 35.1)
Complete (12th standard)	10	2.0 (1.1 to 3.8)
Marital status		
Married	134	40.3 (34.9 to 45.9)
Widowed/separated	101	31.6 (26.5 to 37.1)
Never married	91	28.2 (23.3 to 33.6)
No of children		
None	72	19.2 (15.3 to 23.9)
One or two	163	57.6 (52.8 to 63.1)
More than two	71	23.2 (18.7 to 28.3)
Currently in debt	170	54.7 (48.1 to 60.3)
Home ownership	125	38.9 (31.8 to 42.5)
No of dependents		
None	43	11.3 (8.2 to 15.1)
Less than five	222	69.8 (64.4 to 74.5)
Five or more	51	19.0 (14.9 to 23.9)
Duration in Goa, years		
One or less	43	11.8 (8.5 to 15.8)
2–18	99	30.0 (25.2 to 35.4)
More than 18	82	33.3 (28.1 to 38.1)
From birth	92	26.7 (20.3 to 29.7)
Travel out of Goa in past year	185	57.4 (51.7 to 62.9)
Current alcohol use		
Never	141	42.7 (37.2 to 48.3)
Less than weekly	47	14.2 (10.7 to 18.7)
At least weekly	138	43.1 (37.6 to 48.8)
Lifetime intimate partner violence	124	35.0 (29.9 to 40.5)
Entrapment (forced to remain in sex work against her will)	29	9.2 (6.4 to 13.2)
Autonomy in use of money	220	65.1 (59.5 to 70.5)
Political empowerment (vote in elections)	170	55.1 (48.5 to 60.6)
Lack of social support (past week)	197	59.6 (54.8 to 65.1)
Police raid (since recruitment)	50	14.0 (10.6 to 18.2)
Suicide attempt in past 3 months	73	18.3 (14.9 to 23.2)
Lifetime deliberate self-harm	51	13.8 (9.7 to 18.8)

they in turn gave to three other members of their network who they recruited to the study. Each respondent was given a sum of 100 rupees (US\$3.50) for participating and a further sum of 50 rupees (US\$1.25) for each successfully recruited referral.

Data collection and management

Trained female interviewers administered a questionnaire that was translated and extensively piloted in four Indian languages (Hindi, Konkani, Kannada and Telugu). Sex workers were interviewed in a variety of settings, including hired rooms, lodgings, drop-in-centres, the project vehicle and clinics.

Figure 1 Proximate determinants conceptual framework for assessing the risk of sexual transmission of HIV, HSV-2, herpes simplex virus type 2, STI, sexually transmitted infections.



The questionnaire, which took 60 minutes to complete, was a composite of questions derived from several sources on demographics, psychosocial factors, sex work and sexual risk, knowledge and exposure to HIV prevention interventions, reproductive health and health-seeking behaviour.¹⁵⁻¹⁹ An informal confidential voting interview collected responses to sensitive questions from each respondent.²⁰ Check questions were present for internal consistency. Two independent reviewers checked all questionnaires and inconsistencies were referred back to the field. Data were double entered into an Access database and underwent range and consistency checks.

Laboratory methods

Biological samples were collected using self-administered vaginal swabs, previously validated in Goa,²¹ and dried-blood spots (DBS). For women who refused to take a vaginal swab, first-void urine samples were collected to test for gonococcal and chlamydial infection. One vaginal swab was inserted into a sterile universal container and the other was inserted into an InPouch TV culture kit (Biomax Diagnostics, San Jose, California, USA). Five blood spots were taken according to protocol. All samples reached the laboratory within 24 h of collection. The InPouch TV culture was incubated at 37°C for up to 5 days and underwent daily microscopy for *Trichomonas vaginalis*. The other samples were stored in a -70°C freezer until processing. PCR using the Roche Amplicor system (Roche Molecular Systems, Alameda, California, USA) was used to diagnose chlamydial and gonococcal infection. DBS were tested for antibody to HIV using two ELISA tests, *Vironostika Uni-Form II plus O* (Organon Teknica, Botolph Claydon, The Netherlands) and *HIV enzyme immunoassay (Axi Labystems Ltd, Oy, Vantaa, Finland)*. Discordant tests were confirmed by *Murex HIV 1/2 O* (Abbott Laboratories, Abbott Park, Illinois, USA). DBS

were also tested for incident HIV using the BED assay (Calypte Biomed, Rockville, Maryland, USA), and herpes simplex virus 2 (HSV-2) using the ELISA test HerpeSelect (Focus Technologies, Cypress, California, USA). The laboratory participated in quality control for molecular (UK) diagnostics annual quality control and National AIDS Research Institute external quality control of the DBS.

Sample size considerations

Sample size was chosen in order to be able to estimate a bacterial STI prevalence of 8% within 3% at 95% confidence and HIV prevalence of 30% within 5%. This gave us a sample size of 318 and 310, respectively.

Statistical analysis

In order to adjust for potential biases in recruitment, data were weighted based on network size and relations, age, ethnicity and area, according to how these factors were related to recruitment, using the RDS analysis tool 5.4.0 (Cornell University, USA). Analyses were performed using *Stata 8*, incorporating the weights through the survey analysis functions. All percentages and odds ratios quoted are weighted with 95% CI. Frequency counts are unweighted.

Logistic regression was carried out with any STI (chlamydia, gonorrhoea or trichomonas) and HIV as the two outcome measures. Multiple logistic regression models were built separately for each outcome based on a simple conceptual framework shown in Fig 1.^{14,22} First the socio-demographic factors that were found to be associated with the outcome in univariate analysis $p < 0.2$, or had been identified as a potential risk factor in the literature, were included in a stepwise forward model selection procedure ($p < 0.2$), which led to our base model. Next the association between each sex work, sexual risk and

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Table 2. Work and sexual risk of female sex workers in Giza

Variable	Number* (N = 226)	Weighted prevalence % (95% CI)
Time in sex work, years		
<1	105	28.4 (24.7 to 34.7)
2-10	145	42.6 (37.2 to 48.2)
>10	76	28 (23 to 33.6)
Income from other source than sex work	140	43.9 (38.4 to 49.6)
Street-based sex work	77	22.7 (18.4 to 27.9)
Establishment (bar, lodge, brothel) sex work	192	57.8 (52.1 to 63.2)
Home-based sex work	89	28.0 (23.3 to 33.4)
More than one establishment/sits for sex work	135	38.7 (31.8 to 42.2)
Started sex work under age of 18 years	64	22.6 (16.3 to 29.5)
No of customers in past week		
None	123	38.2 (32.9 to 43.9)
One to seven	170	56.3 (50.5 to 61.7)
More than seven	24	5.5 (3.6 to 8.3)
At least one customer per day	209	62.6 (56.9 to 67.9)
At least one regular paying customer	140	40.2 (34.5 to 45.7)
Intimate non-paying male partner		
None	79	24.2 (19.7 to 29.4)
One	200	61.4 (55.8 to 66.8)
More than one	47	14.4 (10.9 to 18.7)
Change in intimate male partner in past 3 months	19	5.4 (3.4 to 8.4)
Consistent condom use with customers	237	74.4 (69.3 to 78.9)
Consistent condom use with intimate partner	20	8.6 (5.9 to 12.5)
Condom breakage over past 3 months†	68	21.6 (17.1 to 25.9)
Ever have sex without condom for more money‡	46	15.3 (11.5 to 20.0)
Ever forced to have sex without condom§	95	28.7 (24.5 to 35.3)
Source of condom		
Customer brings	154	44.4 (38.9 to 50.0)
Buy	62	18.8 (14.5 to 23.5)
Free from NGO or government	59	21.1 (16.5 to 25.4)
Do not use condoms	51	15.8 (12.2 to 20.3)
Lifetime experience of non-consensual/forced sex	36	8.9 (6.4 to 12.3)
Sexually abused as a child	18	4.6 (2.8 to 7.5)
Lifetime exposure to HIV prevention	111	38.7 (33.3 to 44.4)
HIV knowledge score		
0	100	30.7 (25.8 to 36.1)
1-49%	43	12.0 (8.9 to 16.0)
>50%	183	57.3 (51.7 to 62.8)
Lifetime HIV test	117	37.2 (31.9 to 42.9)
Lifetime pregnancy	285	91.5 (87.9 to 94.1)
Lifetime abortion	91	25.2 (20.7 to 30.2)
Any reproductive tract symptoms in past 3 months	153	43.9 (38.5 to 49.6)

*Weighted percentages calculated by including missing data.
 †N = 226, including women who did not use condoms.
 ‡N = 201, including women who did not answer this question because they did not use condoms.
 §N = 256, including women who did not answer this question because they did not use condoms.
 MED, non-governmental organizations.

reproductive health factor and the outcome was individually tested after adjusting for the factors in the base model. Those factors found to be associated with the outcome ($p < 0.2$), after adjustment, or identified as a priori risk factors in the literature were included in our tables. These factors were then included in a stepwise forward model selection procedure ($p < 0.2$) alongside the factors identified in the base model to create the final model.

The main reason for missing values was that samples were not received or inhibition of the sample occurred during PCR. Seventeen (5%) of the STI samples were missing (four *Chlamydia trachomatis*, *Neisseria gonorrhoea*, *T. vaginalis* not received, six *C. trachomatis*, *N. gonorrhoea* inhibitory and seven *T. vaginalis* only not received). Only one (0.3%) HIV sample was not received. Missing cases were excluded from the analysis. Continuous variables were converted to categories based on

published studies (eg, age), or a priori categories. HIV incidence was calculated using the Centers for Disease Control and Prevention consensus formula:²⁰

$$\text{Incidence} = \{[(365/w)N_{\text{neg}}]/[N_{\text{neg}} + (365/w)N_{\text{ser}}/2]\} \times 100$$

where W is the window period, N_{ser} is the number of recent HIV infections (based on Calypte test) and N_{neg} is the number HIV seronegative.

Ethical considerations

Ethical approval was obtained from the Independent Ethics Commission, Muzibai and University College London's ethics committee. A community advisory board mediated community engagement. We campaigned against the demolition and provided material support in the immediate aftermath. All

Table 3 Association of underlying demographic and psychosocial factors associated with STI and HIV in female sex workers in Goa

Variable	Multivariate OR for STI (95% CI) N = 380	Multivariate OR for HIV ^a (95% CI) N = 325
Age, years	p = 0.001	p = 0.2
<25	1	1
25–35	0.20 (0.10 to 0.47)	1.72 (0.69 to 4.34)
35–45	0.20 (0.11 to 0.39)	1.70 (0.64 to 4.29)
45–55	0.14 (0.08 to 0.27)	1.72 (0.81 to 3.67)
>55	0.27 (0.11 to 0.70)	1.72 (0.66 to 4.58)
Non-Goan ethnicity ^b	p = 0.02	p = 0.2
	0.45 (0.24 to 0.87)	1.61 (0.75 to 3.65)
Religion	p = 0.2	p = 0.884
Hindu	0.60 (0.40 to 1.20)	2.54 (1.20 to 4.90)
Schooling	p = 0.5	p = 0.3
None	1	1
Incomplete	0.50 (0.25 to 1.00)	0.75 (0.43 to 1.30)
Complete	0.60 (0.14 to 2.43)	None have HIV
Unstable	p = 0.5	p = 0.6
	0.70 (0.40 to 1.25)	0.65 (0.39 to 1.05)
Home ownership	p = 0.07	p = 0.3
	0.61 (0.26 to 1.49)	1.30 (0.77 to 2.41)
No of dependents	p = 0.7	p = 0.17
None	1	1
Less than five	0.74 (0.23 to 2.60)	1.65 (0.69 to 3.93)
More than five	0.76 (0.28 to 2.09)	0.71 (0.25 to 2.10)
Duration in Goa, years	p = 0.5	p = 0.63
One or less	1	1
2–10	0.49 (0.22 to 1.13)	0.61 (0.26 to 1.49)
More than 10	0.40 (0.18 to 0.89)	1.68 (0.47 to 2.17)
Never birth	0.55 (0.24 to 1.27)	0.37 (0.15 to 0.95)
Travel out of Goa in past year ^c	p = 0.1	p = 1.6
	1.56 (0.59 to 2.60)	1.68 (0.69 to 1.72)
Political engagement (vote in elections)	p = 0.2	p = 0.4
	1.42 (0.82 to 2.44)	1.49 (0.69 to 3.66)
Entrapment (unable to leave sex work)	p = 0.6	p = 0.1
	0.74 (0.25 to 2.14)	1.53 (0.69 to 2.65)
No financial autonomy	p = 0.07	p = 0.9
	1.67 (0.82 to 2.61)	1.64 (0.63 to 1.68)
No emotional support (past month)	p = 0.6	p = 0.62
	0.94 (0.54 to 1.63)	1.01 (1.12 to 3.27)
Police raid (past month)	p = 0.02	p = 0.02
	2.20 (1.14 to 4.40)	2.22 (1.14 to 4.30)
Delinquent behaviour	p = 0.002	p = 0.16
	2.98 (1.46 to 6.70)	1.60 (0.82 to 3.30)
Intricate partner violence	p = 0.01	p = 0.2
	1.50 (0.84 to 2.60)	0.67 (0.26 to 1.29)
Mental health score	p = 0.4	p = 0.1
	0.50 (0.30 to 1.00)	1.63 (0.69 to 1.87)

^aAge, ethnicity, schooling, home ownership, entrapment in sex of course, police raid in past year and delinquent self-harm were independently associated with STI in multivariate analysis.
^bReligion, number of dependents, migrant status, social support, police raid in the past year and childrens self-harm were independently associated with HIV in multivariate analysis.
^cOnly included in STI multivariate model.
 Only included in HIV multivariate model.
 OR, odds ratio; STI, sexually transmitted infection.

participants and their partners were offered presumptive treatment for bacterial STI as well as treatment based on laboratory tests. HIV results were anonymous; however, voluntary counselling and testing for HIV, treatment for STI and HIV risk reduction counselling was made available to participants and non-participants alike.

RESULTS

A total of 326 sex workers from 35 different networks throughout Goa were recruited. Of the 59 seeds that were approached, 35 recruited women into the study. The mapping study identified four to five networks from which there were no sex workers recruited. We thus estimate a response rate of 88% of identified networks. The size of recruitment networks ranged from small networks of one or two women to larger networks

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Table 4 Factors associated with STI in 368 female sex workers in Goa*

Variable	Adjusted OR† (95% CI)	Adjusted OR; (95% CI)
	Adjusted for base model	Final model
I Demographic and psychosocial factors from baseline model		
Age, years	p = 0.005	p < 0.001
<20	1	1
21–25	0.18 (0.07 to 0.50)	0.13 (0.04 to 0.40)
26–30	0.23 (0.08 to 0.63)	0.14 (0.05 to 0.41)
31–35	0.12 (0.04 to 0.42)	0.05 (0.01 to 0.19)
>35	0.20 (0.07 to 0.57)	0.07 (0.02 to 0.25)
Non-Goan ethnicity	p = 0.03	p = 0.003
	0.59 (0.17 to 0.61)	0.23 (0.09 to 0.61)
Schooling	p = 0.03	p = 0.007
None	1	1
Incomplete	0.50 (0.23 to 1.09)	0.33 (0.14 to 0.80)
Complete	0.07 (0.01 to 0.53)	0.06 (0.01 to 0.40)
Home ownership	p = 0.15	p = 0.1
	0.41 (0.24 to 1.19)	0.58 (0.30 to 1.14)
No financial autonomy	p = 0.09	p = 0.004
	1.70 (0.83 to 3.13)	2.62 (1.36 to 5.04)
Police raid (baise diversion)	p = 0.04	p = 0.21
	2.91 (1.02 to 8.19)	1.61 (0.75 to 3.46)
Delinquent self-harm	p = 0.009	p = 0.002
	2.88 (1.37 to 6.34)	3.73 (1.63 to 8.56)
II Sex work, sexual risk and reproductive health		
Having an intimate non-paying male partner	p = 0.02	p = 0.02
	0.48 (0.24 to 0.99)	0.43 (0.21 to 0.88)
Change in intimate partner over past 3 months	p = 0.15	
	1.97 (0.77 to 5.02)	
Time in sex work, years	p = 0.25	
<1	1	
2–10	0.79 (0.40 to 1.57)	
>10	0.45 (0.10 to 1.18)	
Income from source other than sex work	p = 0.5	
	0.81 (0.44 to 1.48)	
Street-based sex work	p < 0.001	p = 0.006
	3.55 (1.72 to 6.52)	2.95 (1.37 to 6.38)
Establishment (ledge/bar or brothel) sex work	p = 0.15	
	0.62 (0.33 to 1.19)	
Home-based sex work	p = 0.94	
	0.70 (0.34 to 1.46)	
No of customers/week	p = 0.12	p = 0.21
Less than one	1	1
One to seven	1.35 (0.71 to 2.58)	1.58 (0.77 to 3.23)
More than seven	3.11 (1.05 to 9.23)	3.22 (0.79 to 13.21)
At least one regular paying customer	p = 0.05	p = 0.007
	1.85 (1.08 to 3.41)	2.46 (1.28 to 4.73)
Consistent condom use with customers	p = 0.5	
	0.78 (0.41 to 1.51)	
Payment per sex act with customer (per 100 rupees rise)	p = 0.7	
	1.02 (0.94 to 1.10)	
Childhood sexual abuse	p = 0.02	p = 0.01
	3.55 (1.22 to 9.17)	3.78 (1.57 to 10.45)
Lifetime experience of non-consensual/forced sex	p = 0.5	
	1.59 (0.76 to 3.30)	
HSV knowledge score	p < 0.001	p = 0.01
	0.92 (0.89 to 0.95)	0.91 (0.90 to 0.90)
Lifetime exposure to HSV prevention	p = 0.004	
	0.58 (0.19 to 0.79)	
Sexes treatment in the STI clinic (public and non-governmental)	p = 0.06	p = 0.002
	0.19 (0.07 to 1.30)	0.13 (0.02 to 0.71)
No reproductive tract symptoms 3 months	p = 0.01	p = 0.005
	2.58 (1.26 to 4.63)	2.89 (1.49 to 6.02)

*Only variables that were entered into the final model are listed in tables 4 and 5. There are therefore differences in the variables in these two tables.
†Adjusted for confounding factors from base model, i.e. age, ethnicity, schooling, home ownership, autonomy in the use of money.

police raid and deliberate self-harm.
 †Weighted adjusted odds ratio (OR) of the final model reported here.
 STI, sexually transmitted infection.

of approximately 30 women. We recruited up to six waves. All areas and types of sex work identified in mapping were represented in the sample.

STI and HIV

Seventy-seven women (25.7% CI 21.0 to 31.1) had prevalent HIV infection. The estimated incidence of HIV was 4.7% (CI 2.4 to 8.9) per annum. The prevalence of chlamydial infection was 7.3% (CI 5.1 to 10.5; n = 30), gonococcal infection was 8.9% (CI 6.2 to 12.7; n = 30) and *T vaginalis* infection was 9.4% (CI 6.6 to 13.2; n = 31). The prevalence of at least one of the three bacterial STI was 22.0% (CI 17.7 to 27.0; n = 75). Antibodies to HSV-2 were detected in 57.2% (CI 51.5 to 62.7; n = 182) of women. Of the 75 women in whom curable STI were detected and treated, 57 (76%) were traceable for retesting 3 months following adequate treatment, of whom nine (16%) had a new or repeat infection.

Table 1 shows that sex workers were mobile, predominantly non-Goan, young and illiterate. More than half were indebted and 90% supported dependents. They were unsupported and experienced high levels of intimate partner and sexual violence.

Sex work was diverse (table 2). Sex workers were widely dispersed; practising in 577 different lodges, establishments and areas, including 57 in states other than Goa. The median payment per customer was 100 rupees (US\$2), ranging from 10 to 5000 rupees (US\$0.2–200). Seven per cent (CI 5 to 18; n = 30) and 5% (CI 3 to 8; n = 21) performed oral and anal sex, respectively.

Risk-reduction strategies and exposure to interventions (table 2)

A total of 74.4% (CI 69.3 to 78.9; n = 237) of sex workers reported consistent condom use with customers, which was similar to the 71.3% (CI 66.0 to 76.1; n = 233) who reported condom use with their last customer in the secret ballot. Condom breakages, being forced by a customer to have sex without a condom, accepting more money in exchange for sex without condoms and lack of use with intimate partners were commonly reported. Response to HIV prevention interventions and knowledge about HIV was poor. A total of 46.2% (CI 37.9 to 54.7; n = 68) sought care from a private practitioner for their STI symptoms, whereas 44.8% (CI 36.4 to 53.0; n = 70) did not access any care at all.

Determinants of infections (tables 3, 4 and 5)

STI were independently associated with Goan ethnicity, youth, lack of schooling, no financial autonomy, deliberate self-harm, sexual abuse, having regular customers, working on the streets, not having an intimate partner and being asymptomatic. Having knowledge about HIV and access to free STI services was associated with a lower likelihood of STI.

HIV was independently associated with being Hindu, recent arrival in Goa, brothel and lodge-based sex work, genital ulcer disease and dysuria. Those with prevalent HIV were more likely to have social support and less likely to have an intimate partner.

DISCUSSION

Following the demolition, sex work in Goa has become heterogeneous, widely dispersed with a high prevalence of STI

and HIV. Youth and illiteracy, indebtedness and support of dependents, migrant status and exposure to violence, limited access to HIV preventative and STI treatment services, contribute to their vulnerability.

The presence of a treatable bacterial STI is a marker of recent sexual risk. Several structural factors, suggesting gender disadvantage, were independently associated with having a bacterial STI, namely youth, lack of schooling, childhood sexual abuse, deliberate self-harm and lack of financial autonomy. Street-based sex workers and those who had regular customers were particularly vulnerable. Our ethnographic study suggests there were additional pressures to forgo condom use with ‘more intimate’ regular customers. Those who demonstrated greater knowledge of HIV prevention and who accessed free and dedicated STI services had a lower likelihood of having an STI, suggesting that sexual risk-reduction interventions were effective in either reducing high-risk behaviour or improving recognition and treatment of STI. The paradoxical association between no symptoms and the presence of an STI may be explained by the fact that women with symptoms were more likely to have visited a healthcare provider and thus to have received an antibiotic.

Non-Goan sex workers were less likely to have bacterial STI. Our qualitative study suggested that Goan sex workers who had entered sex work since the demolition of the red-light area worked in isolation through mobile phones and were less likely to be professional or networked. In contrast, non-Goan sex workers who were mostly from Karnataka had often entered sex work through the Devadasi tradition (dedicated to the temple). Many had practised in the Baina red-light area before the demolition, identified as sex workers, and were part of a larger network of independent sex workers. They may also have been exposed to the extensive HIV prevention interventions in their native Karnataka. The qualitative data also suggest that male clients were less likely to insist on condom use with Goan sex workers, who they perceived as less likely to carry HIV.

Recent migrants were more likely to have HIV. This, as in other settings,²⁹ probably reflects the higher prevalence in northern Karnataka, their place of origin.¹ Similarly, the association with being Hindu may be consequent to the prevalence of HIV in non-circumcised partners in the women’s non-paying sexual networks.³⁰ Understanding these sexual networks, within which sex workers engage in unprotected sex, may identify more vulnerable subgroups to engage in HIV treatment programmes.

The importance of structural/environmental determinants of sexual risk corroborates findings from neighbouring Karnataka.⁶ It also adds to the evidence linking intimate partner violence and gender disadvantage with HIV and sexual risk.²⁹ Although the effectiveness of tackling structural factors on HIV risk is yet to be proved in a randomised controlled trial,²⁷ our study suggests that interventions to empower women in managing their finances and tackling violence from intimate partners and society warrants further evaluation.

In keeping with the evidence, we found a relationship between HIV knowledge and recent sexual risk.⁷ However, effective interventions, including those that tackle structural factors, have been based in geographically defined brothels and red-light districts. Intervention delivery to dispersed and clandestine sex work, such as that that emerged from the

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Table 5 Factors associated with HIV in 325 female sex workers in Goa*

Variable	Adjusted OR [†] adjusted for base model (95% CI)	Adjusted OR [‡] final model (95% CI)
I Demographic and psychosocial factors from base model		
Age, years	p = 0.8	p = 1
<20	1	1
21–25	1.69 (0.47 to 5.47)	0.99 (0.21 to 3.95)
26–30	1.94 (0.53 to 6.74)	0.92 (0.21 to 4.10)
31–35	1.95 (0.48 to 6.93)	0.81 (0.14 to 4.62)
>36	2.12 (0.57 to 7.93)	1.18 (0.24 to 5.76)
Religion	p = 0.001	p = 0.002
Hindu	2.94 (1.54 to 5.62)	3.31 (1.53 to 7.13)
No of dependants	p = 0.006	p = 0.006
None	1	1
Less than five	1.32 (0.51 to 3.39)	1.71 (0.62 to 4.73)
Five or more	0.51 (0.16 to 1.61)	0.62 (0.18 to 2.25)
Duration in Goa, years	p = 0.09	p = 0.03
One or less	1	1
2–10	0.46 (0.19 to 1.12)	0.27 (0.09 to 0.85)
More than 10	0.66 (0.27 to 1.61)	0.33 (0.11 to 0.99)
Since birth	0.32 (0.11 to 0.92)	0.21 (0.07 to 0.66)
Lack of social support (past week)	p = 0.02	p = 0.04
	0.49 (0.27 to 0.94)	0.58 (0.26 to 0.95)
Police raid (since deregulation)	p = 0.006	p = 0.003
	3.03 (1.30 to 6.93)	2.17 (0.92 to 5.11)
Deliberate self-harm (lifetime)	p = 0.07	p = 0.3
	2.16 (0.93 to 4.98)	1.66 (0.67 to 4.02)
II Sex work, sexual risk and reproductive health		
Having an informal non-paying male partner	p = 0.09	p = 0.04
	0.56 (0.29 to 1.10)	0.47 (0.22 to 0.97)
Duration in sex work, years	p = 0.03	p = 0.07
<1	1	1
2–10	2.89 (1.27 to 6.15)	2.56 (1.14 to 5.75)
>10	2.72 (1.08 to 6.97)	2.19 (0.88 to 5.47)
Income from source other than sex work	p = 0.7	
	0.83 (0.48 to 1.61)	
Street-based sex work	p = 0.4	
	0.74 (0.36 to 1.56)	
Establishment (brothel, lodge or bar) sex work	p = 0.02	p = 0.04
	2.04 (1.12 to 3.73)	2.01 (1.02 to 3.95)
Home-based sex work	p = 0.03	
	0.46 (0.23 to 0.92)	
More than one establishment/site for sex work	p = 0.1	p = 0.08
	0.57 (0.29 to 1.11)	0.51 (0.24 to 1.09)
No of customers/week	p = 0.4	
Less than one	1	
One to seven	1.26 (0.69 to 2.19)	
More than seven	0.45 (0.09 to 2.19)	
At least one regular customer	p = 0.1	
	0.63 (0.35 to 1.14)	
Consistent condom use with customers	p = 0.002	
	3.04 (1.45 to 6.37)	
Payment per sex act with customer (per 100 rupee increase)	p = 0.06	p = 0.1
	0.85 (0.71 to 1.00)	0.81 (0.62 to 1.06)
HIV knowledge score	p = 0.2	
	1.02 (0.89 to 1.16)	
Lifetime exposure to HIV prevention	p = 0.04	
	1.80 (1.03 to 3.16)	
Lifetime HIV test	p = 0.15	
	1.59 (0.94 to 2.36)	
HIV-2	p = 0.02	
	2.85 (1.10 to 8.02)	
Any sexually STI	p = 0.8	
	0.89 (0.48 to 1.69)	

Continued

Table 5 Continued

Variable	Adjusted OR ^a adjusted for same model (95% CI)	Adjusted OR; final model (95% CI)
Dysuria (3 months)	p = 0.01 3.21 (1.24 to 8.32)	p = 0.06 2.88 (1.08 to 7.90)
Dysuria (3 months)	p = 0.001 3.95 (1.24 to 12.04)	p = 0.002 5.58 (1.62 to 19.17)

^aOnly variables that were entered into the final model are listed in tables 4 and 5. There are therefore differences in the variables in these two tables.
^bAdjusted for demographic and psychosocial factors, i.e. age, village, number of dependants, religion, caste, social support, experience of a police raid in the past year, and distance self-home.
^cWeighted adjusted odds ratio (OR) of the final model against here.
^dOrbital curvature was adjusted for the other factors in the model in 1.93 (0.96 to 4.06) p = 0.06.
^eHSV-2, herpes simplex virus type 2, STI, sexually transmitted infection.

demolition of the red-light area, is difficult. One effective solution is collectivisation,²⁴ wherein empowered sex workers develop and deliver interventions themselves. Peer-delivered interventions have reached the majority of sex workers in parts of Karnataka.²⁵ Although the feasibility of effective collectivisation of disempowered and non-professional sex workers is in doubt,²⁶ our success at reaching some of the most hidden networks through RDS is encouraging for peer-driven interventions.

Bacterial STI were five times more common in the study participants compared with rural women in Goa.²⁸ The prevalence of bacterial STI and HIV found in the sex workers in this study is also higher than in sex workers in the neighbouring districts of Karnataka and Maharashtra and more closely resembles the high prevalence red-light areas of Mumbai and Pune.⁶ Reducing this burden of infection through syndromic management is constrained by the absence of a relationship between symptoms and bacterial STI as well as high STI re-infection rates. A combined approach of providing presumptive treatment followed by regular algorithm-driven screening has been advocated for sex workers.⁷ However, again the challenge remains how to deliver treatment to such geographically dispersed women. One possibility is to utilise RDS type vouchers to refer cases to a mixture of accredited services; an alternative approach might be to delegate treatment delivery to experienced peers or outreach workers.

We conducted the study in a broad sample of sex workers, from different networks and typologies, many of whom had never accessed services. We used pre-existing survey tools; the questionnaire was informed by the qualitative work, translated and extensively field tested. The close involvement of the researchers in advocacy against the demolition may have resulted in interviewer bias. To minimise social desirability bias we used externally verifiable outcomes, and triangulated

behavioural data using different data collection methods. Formative work showed DBS to be more acceptable and feasible to collect than venous blood. Whereas the HIV kits used have been validated for DBS, this was not the case for the Focus HSV-2 kit. Although it is reassuring that, when compared against HSV-2 testing in serum, sensitivity and specificity analysis of DBS using 32 samples was 91% and 100%, respectively, this was a small sample and must be viewed with caution. The use of the BED detected assay for incident HIV can misclassify late infection as early, therefore the HIV incidence reported here must be interpreted with caution.^{29,30} To reduce selection bias we used chain sampling, in which an approximate probability of recruitment can be calculated for each participant. This probability of recruitment is then inverted to form the weights, which were used in analysis. This gives an approximately unbiased analysis. Moreover, through our extensive mapping we are confident that nearly 90% of the networks were represented in the final sample. However, bias may arise in our analysis if the selection of network members for recruitment is based on factors related to our outcome measure. Furthermore, the full complexity of the RDS sample is not reflected in the standard errors, and so the CI and p values should be viewed as approximate. The long duration of recruitment reflects the difficulties of reaching this hidden population in the coercive environment following the demolition. Although this could theoretically lead to temporal changes in behaviour over time, we found behaviour was more closely related to the type of sex work and area of work than the time of recruitment.

CONCLUSIONS

Our study provides further evidence for structural and gender-based determinants of HIV and STI. Following the demolition of the red-light area, sex workers in Goa are a dispersed and heterogeneous group, with high levels of treatable bacterial STI and HIV and limited access to services. Given that those who accessed free STI services and had good HIV knowledge were at lower risk of bacterial STI, it is paramount that successful interventions are rapidly scaled up. Focusing intervention delivery to empowered sex workers will probably raise the expectation that the underlying factors that increase their vulnerability to HIV and STI are also tackled. The challenge will be to move beyond tokenistic stakeholder involvement and secure sustainable funding for multifaceted individual and structural interventions.

Acknowledgements The authors are grateful to the Wellcome Trust for supporting this work through a fellowship grant to the first author. The authors would like to thank Anil Parvay and Sheelam Fonseca for administrative support to the research project.

Key messages

- ▶ A heterogeneous and dispersed sex work emerged from the demolition.
- ▶ Sex workers in Goa are a vulnerable core group, with high levels of bacterial STI and HIV.
- ▶ Societal factors and in particular gender disadvantage are associated with sexual risk.
- ▶ Sex workers who access free and dedicated STI services and HIV prevention are less likely to have bacterial STI.
- ▶ Tackling structural determinants of sexual risk is integral to HIV preventions.

Original article

and Susrita Mondal for clearing the data; also the board members and staff of Positive People for supporting them in their work and in particular the research team for their tireless work under grueling conditions. They also wish to thank the laboratory staff in Sangli for processing the samples and rapidly adopting to the changing requirements of field-based sampling; the sex workers of Bales and Goa for reaching them with open arms despite the harsh circumstances, for participating in this study, for implementing the findings and providing consent; and acknowledging critical feedback through the community advisory board and peer educators; Cheryl West for training the laboratory staff and setting up the standard operating procedures and quality control monitoring and flowchart leading to initial PCR testing; Dr Richard of the National AIDS Research Institute, Pune, for quality control of the samples; Bharat Parikh for advice on the BED assay for HIV; and Douglas Habelkorn and Oyarin Wajant for guidance with RDS analysis.

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Contributors: MS designed and implemented the study, reviewed, analysed and interpreted the data, wrote the first and subsequent drafts of the manuscript, final approval of the published manuscript, had full access to all the data for the study and took final responsibility for the decision to submit for publication. FC participated in the design of the study, interpretation of the data and critical appraisal of all the drafts of the manuscript and final approval of the published manuscript. SW participated in the implementation of the study, collection and analysis of the quantitative data and critical appraisal of all the drafts of the manuscript and final approval of the published manuscript. AG supported the statistical analysis of the quantitative data and was involved in the critical appraisal of all the drafts of the manuscript and final approval of the published manuscript. VP and DM participated in the design of the study, interpretation of the data and critical appraisal of all the drafts of the manuscript and final approval of the published manuscript. The design and implementation of the study was independent of the funding body and the findings do not reflect the opinions of Wellcome Trust. Any biases arising from the sampling that the authors may have had for the sex work community were dealt with explicitly in the study design.

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Suicidal Behavior Among Female Sex Workers in Goa, India: The Silent Epidemic

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Objectives. Suicide is common in young women in South Asia. This is the first study of the prevalence of suicidal behaviors and the association with social and gender disadvantage, sex work and health factors, among female sex workers in India.

Methods. With respondent-driven sampling, we recruited 326 female sex workers in Goa who completed an interviewer-administered questionnaire that elicited information about self-harming behaviors, socio-demographics, sex work, gender disadvantage, and health indicators. Biological samples were tested for sexually transmitted infections. We used multivariate analysis to define the determinants of suicide attempt.

Results. Nineteen percent reported attempted suicide in the past 3 months. Attempted suicide was independently associated with intimate partner violence (adjusted odds ratio [AOR]=2.70; 95% confidence interval [CI]=1.38, 5.28), violence from others (AOR=2.26; 95% CI=1.15, 4.45), entrapment (AOR=2.76; 95% CI=1.11, 6.83), regular customers (AOR=3.20; 95% CI=1.61, 6.35), and worsening mental health score (AOR=1.05; 95% CI=1.01, 1.11). A lower likelihood of suicide attempt was associated with Kannad ethnicity (AOR=0.41; 95% CI=0.17, 0.95), HIV prevention services exposure (AOR=0.28; 95% CI=0.09, 0.85), and having a child (AOR=0.38; 95% CI=0.16, 0.89).

Conclusion. Suicidal behaviors were common and associated with factors associated with gender disadvantage and poor mental health. The widespread HIV prevention programs for sex workers provide an opportunity to develop community-based interventions against gender-based violence and integrate mental health into sexual health services.

Suicide is a public health priority in India. Rates of suicide in India are 5-fold higher than in the developed world^{1,2} with particularly high rates of suicide in young women.³⁻⁵ Verbal autopsy surveillance from Southern India suggests that suicide accounts for 50% to 75% of all young adult female deaths and average suicide rates of 158 per 100,000.²

Common mental disorders such as depressive and anxiety disorders, and social disadvantage such as gender-based violence and poverty are major risk factors for

Comment [M&MQ1]: AU: suicidal behavior? Suicide attempt?

Comment [M&MQ2]: AU: The "Objectives" section does not explain why "Methods" includes testing for STIs

Comment [M&MQ3]: AU: The "Methods" section does not mention the collection of some data (e.g., intimate partner violence) mentioned in "Results."

Comment [M&MQ4]: AU: attempt?

Comment [M&MQ5]: "Gender disadvantage" was not mentioned earlier.

Comment [MS6]: Intimate partner violence and entrapment are factors associated with gender disadvantage

Comment [MS7]: Given that exposure with hiv services was associated with lower suicide attempt and that hiv prevention services targeting FSWs are wide spread in India this could be a vehicle to deliver services

Comment [M&MQ8]: AU: Please clarify the use of HIV prevention programs for mental health intervention-

suicide in women^{1,3,6-8} Although research from high-income countries shows that common mental disorders are a major contributor to the risk of suicidal behavior, their role is less clear in low- and middle-income countries where social disadvantage has been found to be at least as important.^{1,3,6-8} Gender disadvantage is increasingly seen as an important contributing factor to the high rates of suicide seen in women in Asia.^{1,3,6,7} Gender-based violence is a common manifestation of gender disadvantage and has been linked with common mental disorders and suicide in population-based studies of women and young adults in Goa.^{4,5,9} Lack of autonomy, early sexual debut, limited sexual choices, poor reproductive health, and social isolation are other manifestations of gender disadvantage.

Sex work in India is common. An estimated 0.6% to 0.7% of the female adult urban population are engaged in commercial sexual transactions.¹⁰ Studies from developed nations have found a high prevalence of self-harming behaviors in people engaged in transactional sexual activity.¹¹ There is also growing evidence suggesting that HIV-positive individuals from traditionally stigmatized groups report higher rates of violence exposure and suicidal ideation.^{12,13} Female sex workers in India are a traditionally stigmatized group, with high prevalence of HIV,¹⁰ and levels of stigma and violence that relate to the context of their work.¹⁴ Yet, despite substantial investigation of their reproductive and sexual health needs, there is virtually no information on suicide and its determinants in female sex workers from low- and middle-income countries.¹⁵

As demonstrated in the hierarchical conceptual framework outlined in **Figure 1**,^{4,5,9} we hypothesized that gender disadvantage, sex work, and health factors together with factors indicative of social disadvantage are distal determinants of female sex workers' vulnerability to suicidal behaviors,^{4,5,9,15} the effects of which would be

mediated though poor mental health.³ We describe the burden of suicidal behaviors in a cross-sectional sample of female sex workers in Goa, India. We explore the association of sociodemographic factors, type of sex work, sexual health, and gender disadvantage, with and without measures of poor mental health, on suicide attempts in the past 3 months.

METHODS

We physically mapped the urban centers, migrant slums, and coastal belt with a team of trained field researchers. We completed site inventories for each area and using participatory observation, focus group discussions, and semistructured key informant interviews we identified the type and number of female sex workers, and where, when, and how they worked. This formed the basis of the sampling framework for a cross-sectional study of female sex workers.

Study Setting

The study was set in Goa, a small coastal state with a population of 1.37 million.¹⁶

The main industries are tourism, fishing, and mining.¹⁷ Goa has more than 1.5 million domestic and international tourists annually, and a corresponding number of seasonal migrants. Consequent to this thoroughfare of seasonal visitors, Goa has a large population of predominately migrant female sex workers.

The rapid ethnographic mapping of sex work, which followed the demolition of the Baina red-light area in June 2004, showed that homogeneous brothel-based sex work evolved into a heterogeneous dispersed and clandestine trade.¹⁸ This consisted of street-based female sex workers soliciting in railway stations, bus stops, and municipal parks; sex workers working 10- to 14-day contracts in lodges throughout Goa; sex workers working from home and through mobile phones; women on short-term contracts to pimps and confined to flats; female construction workers and women residing in urban slums subsidizing their meager income with transactional

Comment [MS10]: Two (SW and MS) of the authors trained a team of researchers to conduct the mapping in the various local languages. SW and MS were also involved in the mapping themselves so it is a mix of we and other trained field workers, Therefore we would also be suitable

Comment [M&MQ11]: AU: Are the "Researchers" the authors? In other words, can we say "We physically mapped . . ."? Also, who completed the site inventories and conducted the interviews? The authors? In other words, "We completed site inventories. . ."?

Comment [M&MQ12]: AU: Female construction workers?

Comment [M&MQ13]: AU: Does "slum women" mean women who live in slums?

sexual relations; and the survivors of the Baina demolition continuing to operate from the neighboring slums.

The HIV-prevention interventions that the women were exposed to were a composite of sexual risk reduction counseling delivered through outreach workers and peer educators, provision of condoms, and referrals of symptomatic women for treatment of sexually transmitted infections (STIs; unpublished data available from corresponding author).

We conducted this study throughout Goa in collaboration with Positive People, the largest HIV nongovernmental organization in Goa, with more than a decade of experience of working with female sex workers. Recruitment took place from December 2004 to December 2005. Women who had provided sexual services in exchange for goods or money over the past 3 months were eligible to participate in the study.

Sampling Method

We used respondent-driven sampling (RDS) to recruit the female sex workers in the survey.¹⁹ This variant of chain sampling delves deeper into the hidden networks by rationing the number of recruits per respondent, increasing the number of waves of recruitment, and providing financial incentives to the “recruiter.”

We defined the initial recruiters, also known as “seeds,” as female sex workers or community members proximate to the sex workers. We purposively selected seeds from various ethnicities, ages, areas of Goa, and sex-work categories that were identified during the qualitative phase of the study. The seeds received vouchers with unique numbers to recruit 3 other members of their network into the study. Each respondent received a sum of 100Rs (US\$2.50) for participating and a further sum of 50Rs (\$1.25) for each successfully recruited referral. In keeping with other studies that have utilized RDS we aimed for 6 waves of recruitment.¹⁹

Comment [M&MQ14]: AU: I changed the actions in this section from passive voice (“the recruiters were defined”) to active voice (“We defined”), assuming that it was the authors who performed these actions. Is this OK?

Comment [MS15]: Yes that is OK it reads better

Ethical approval was obtained from the Independent Ethics Commission, Mumbai and University College London's ethics committee. A community advisory board mediated community engagement. Participants that were found to be psychologically distressed or were suicidal were referred to services at Positive People and *Sangath*, a community-based mental health nongovernmental organization, or to public sector psychiatric services. All participants and their partners were offered presumptive treatment of bacterial STIs as well as treatment on the basis of laboratory tests. HIV test results were anonymous; however, voluntary counseling and testing for HIV, treatment of STIs, and HIV risk reduction counseling were made available throughout.

Measures

We trained female interviewers to administer a questionnaire that was translated and extensively piloted in 4 Indian languages. They interviewed female sex workers in private settings including hired rooms, lodgings, drop-in-centers, project vehicle, and clinics. The questionnaire, which took 60 minutes to complete, was a composite of questions derived from several sources covering 5 domains: sociodemographic factors, sex-work and sexual risk factors, gender disadvantage, health, and suicidal behavior.^{20–22} The following domains were measured through the questionnaire:

Sociodemographic factors.

These covered age, ethnicity, religion, literacy, schooling, marital status, debt, homeownership, the responsibility to support dependents, number of children, and migration status.

Sex work–related factors.

These included duration in sex work, age at starting sex work, type of sex work (brothel-based, street-based, or home-based), part-time sex work (defined as a woman whose sole source of income was not sex work), the number of customers (regular and non regular), income per customer, condom use with customers, having a

Comment [M&MQ16]: AU:
What is "project vehicle"?

Comment [MS17]: This is the
car that we used to travel around
Goa and carry specimens

nonpaying intimate partner, and change in nonpaying intimate partner in the past 3 months.

Gender disadvantage.

We assessed gender disadvantage in 2 ways: First, we elicited the participant's experience of violence through questions about lifetime experience of verbal and physical violence from intimate nonpaying sexual partners and others in the community. We collected experience of sexual violence from family and society with the confidential voting interview.²³ Second, we measured the participants' autonomy to make decisions as entrapment (i.e., unable to leave sex work by choice), financial autonomy (i.e., having money to utilize as they choose), political autonomy (i.e., having exercised the right to vote during elections), and, finally, the autonomy to make decisions regarding their own sexual safety with clients.

Social support.

We measured the extent of participant's social support, as whether they had someone to turn to for support in the past week and whom they turn to for support.

Sexual health.

We used questions adapted from the Indian national survey to assess changes in behavior and prevalence of HIV and other STIs in populations at risk for HIV known as the Integrated Behavioral and Biological Assessment²⁴ to elicit knowledge regarding HIV transmission and prevention. We ascertained recent and lifelong exposure to HIV prevention interventions. We defined infertility as failed attempt to have a child over the past year. We used the confidential voting interview to elicit information about ever having had an abortion. Women were asked to provide self-taken vaginal swabs and dried-blood spots. The vaginal specimens were tested with the Roche Amplicor PCR assay (Roche Molecular Systems, Alameda, CA, USA) for chlamydial and gonococcal infection, and InPouch TV culture kit (Biomed Diagnostic, San Jose, CA, USA) for *Trichomonas vaginalis*. The dried-blood spots

Comment [M&MQ18]: AU:
Please provide manufacturer
name, city, and state or country.

were tested with a World Health Organization testing algorithm for HIV, and enzyme-linked immunosorbent assays for herpes simplex virus 2 antibodies (HerpeSelect, Focus Technologies, Cypress, CA, USA)²⁵

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Please provide manufacturer's city and state or country.

Mental health.

We assessed mental health with the **K10**, a 10-item questionnaire^{26–28} that has been widely validated in the Indian settings including Goa.²⁹ This questionnaire elicits the frequency of various depressive and anxiety symptoms over the past month on a 4-point Likert scale of frequency and generates a continuous score (range from 0 to 40) measuring the severity of symptoms of common mental disorders.

Comment [M&MQ20]: AU:
Is this the full name of the test?

Comment [MS21]: Yes K10 is the name of the questionnaire

Substance abuse.

We rated use of alcohol, *Gutka* (chewed tobacco), and smoking of tobacco on a 6-point Likert scale, which we recategorized to at least once a week, less than once a week, and never.

Comment [M&MQ22]: AU:
use of *smoked tobacco*?

Suicidal behaviors.

We measured suicidal behaviors with separate questions to elicit whether participants had contemplated, planned, or attempted suicide in the past 3 months.

To reduce social desirability bias, we used an informal confidential voting interview to collect responses to sensitive questions; participants posted their responses to sensitive questions into a color-coded ballot box, enabling them to conceal their response from the interviewer.²³ We used validity checks to measure internal consistency. Two independent reviewers checked all questionnaires and any inconsistencies were referred back to the field and corrected. We double entered the data into Microsoft Access database (Microsoft, Redmond, Washington, USA) and underwent range and consistency checks.

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Please provide manufacturer name, city, and state or country

Statistical Analysis

To adjust for potential biases in recruitment, we weighted data by the inverse of the approximate probability of recruitment.¹⁹ We calculated the weights on the basis of

network size, age, ethnicity, and area, according to how these factors were related to recruitment, by using RDS Analysis Tool 5.4.0 (Cornell University, Ithaca, NY, USA). We performed analyses with Stata version 8 (Stata Corp, College Station, TX), incorporating the weights through the survey analysis functions. All percentages and odds ratios quoted were weighted with 95% confidence intervals (CIs).

Comment [M&MQ24]: AU: Ithaca, NY?

We carried out logistic regression with suicide attempt in the past 3 months as the outcome. We built multiple logistic regression models for the outcome based on a hierarchical conceptual framework shown in Figure 1. First we included the sociodemographic (underlying) factors that were found associated with the outcome in univariate analysis $P \leq .2$ in a stepwise forward model selection procedure ($P \leq .2$). This led to our base model.

Comment [M&MQ25]: AU: Is the *P* value needed twice in this sentence?

Comment [MS26]: Yes as it the cut off was used for both univariate and multivariate analysis

Next we individually tested the association between each of the gender disadvantage, sex-work, and health factors and suicide while simultaneously adjusting for the factors in the base model. We present the resulting adjusted odds ratios in our tables. We included those factors found associated ($P \leq .2$) after adjustment together in the final model selection. Therefore, the final model was a composite model that included the previously mentioned factors selected in a stepwise forward model selection procedure ($P \leq .2$) and the factors from the base model. We then fitted the final model with and without mental health scores to examine the effect of the distal factors independently and with potential mediating effect of poor mental health. Adjusted odds ratios of the final model with and without mental health score are presented in the tables.

One woman refused to answer the questions on suicide attempt and was excluded from the analysis. We converted continuous variables to categories based on

published studies and a priori definitions. We tested for interaction between all pairs of factors in the final model.

RESULTS

We recruited 326 sex workers from 35 different RDS networks throughout Goa. Of the 59 seeds that were approached, 35 recruited women into the study. Through our extensive mapping we became aware of sex worker networks that we were unable to recruit; these mainly comprised women who did not self-identify as sex workers. We recruited up to 6 waves, with recruitment networks comprising 2 to 30 participants. All the different types of sex work identified during mapping were represented in the sample.

The socioeconomic characteristics of the study population are presented in Table 1. Most participants were aged younger than 30 years, Hindu, and from the neighboring state of Karnataka. Two thirds had not attended school and 82% could not read or write. The majority were married, supported dependents, and did not own their own house. A little more than half were in debt.

Prevalence of Suicidal and Self-Harm Behaviors

In the previous 3 months, the prevalence of suicidal ideation was 34.9% (95% CI=|29.8, 40.3; n|=126), the prevalence of suicide planning was 25.6% (95% CI=|21.1, 30.6; n|=95), and the prevalence of suicide attempt was 18.7% (95% CI=|14.9, 23.3; n|=73). The prevalence of suicide attempts in the past 3 months in women aged younger than 20 years was 41.5% (n|=17).

The Determinants of Suicide Attempts

Several sociodemographic factors, such as age, ethnicity, attending school, number of children, and duration in Goa were associated with suicide attempt in the past 3 months (Table 1). After we adjusted for other socioeconomic factors, being of Kannad (migrant) ethnicity and having at least 1 child were independently associated with lower likelihood of reporting a **suicide attempt**.

Comment [M&MQ27]: AU:
Lower risk of suicide attempt?

Table 2 describes the association between sex work factors and suicide attempts in the past 3 months after we adjusted for socioeconomic factors. Ever having worked in the Baina red-light area was associated with a lower likelihood of suicide attempts.

Having more and regular customers were associated with greater likelihood of suicide attempts.

Table 3 describes the relationship between gender disadvantage and suicide attempts in the past 3 months after we adjusted for socioeconomic factors. We found that 35% of all study participants had experienced intimate partner violence, 9% had experienced sexual violence, 27% had been coerced into unsafe sexual activity with a client, and 14% had been involved in a police raid over the past year. Physical and verbal intimate partner violence, violence from other people, and sexual violence were associated with suicide attempt.

Comment [M&MQ28]: Is it 35% of all the women in the study, or 35% of those who made suicide attempts in the past 3 months?

Comment [M&MQ29]: AU: Does “over the past year” refer to involvement in a police raid only, or to all of the factors in this sentence?

Comment [MS30]: Only the police raid

Table 4 describes the relationship between health indicators and suicide attempts in the past 3 months after we adjusted for socioeconomic factors. Bacterial STIs were present in 22%, HIV in 26%, and herpes simplex 2 in 57%. Having exposure to an HIV prevention intervention was associated with lower likelihood of suicide attempt but there was no association between likelihood of suicide attempt and sexually transmitted infections.

Comment [M&MQ31]: AU: suicide attempt? Suicidal behaviors?

Comment [M&MQ32]: AU: no association between likelihood of suicide attempt and any diagnosed infection?

The final model shows that after simultaneous adjustment for the factors from the base model and the factors from other domains ($P < .2$), intimate partner violence, violence from others, entrapment, and having regular customers were independently associated with suicide attempts. Kannad ethnicity, having exposure to HIV prevention services in the past 3 months, and having at least 1 child were associated with lower probability of suicide attempts. After inclusion of mental health indicators into the model, we observed that having a higher (i.e., poor) mental health score was

independently associated with suicide attempts. Inclusion of mental health indicators did not affect the direction or magnitude of the distal determinants of self reported suicide attempts. There were no significant interactions between any of the exposure variables in the final model.

Comment [M&MQ33]: AU: attempt? Suicidal behaviors?

Comment [M&MQ34]: AU: between what indicators?

DISCUSSION

To the best of our knowledge, this is the first study of suicidal behavior in female sex workers in India. Suicidal behaviors were very common, particularly in young women. Gender disadvantage (notably violence, entrapment, and childlessness), type of sex work, and poor mental health were associated with suicide attempts. Sex workers who had attended a sexual risk reduction session in the past 3 months were 3 times less likely to have attempted suicide in the same period, suggesting HIV prevention interventions served as a vehicle to promote their mental health.

Comment [M&MQ35]: AU: Do you want to break up the Discussion section with any subheads?

Comment [MS36]: Two added Strengths and limitations and conclusions

The prevalence of suicidal behaviors, particularly in young women in this study, was remarkably high. Suicide is a leading cause of death in young women in India.^{1,2} A prospective cohort of 2494 women in Goa found a 0.8% annual incidence of attempted suicide.⁴ A cross-sectional study of 3662 young people in Goa found that 6% of women aged 16 to 24 years had contemplated suicide in the past 3 months.⁵ Our study reports on a particularly disadvantaged group of women who have traditionally been excluded from mainstream health policies and services. A Chinese study in a comparable population found 14% of female sex workers had contemplated and 8% had attempted suicide in the preceding 6 months.¹⁵ During the study, Goa government demolished the red-light area. The negative publicity surrounding the demolition and the subsequent increased stigma and violence experienced by female sex workers in Goa may explain the extremely high levels of self-reported suicidal behavior.

Intimate partner violence is extremely common in India. The 2005–2006 National Family Health Survey found that 37% of women had experienced intimate partner physical or sexual violence.³⁰ A cohort study of women in Goa found a lifetime experience of any of verbal, physical, and sexual abuse of 15%.⁴ The prevalence of domestic violence among the sex workers in this study, although close to the national average, is higher than that for rural women in Goa. Moreover, sex workers differ from other women in their experience of violence from the wider community, i.e., from police, clients, pimps, brothel owners, and community members. We found an association between suicide attempts and intimate partner violence similar to that described in other studies.⁴ However, we also found an independent association, of a similar magnitude, with violence from others.

Comment [M&MQ37]: AU: experience of all 3 types of abuse?

Regarding other measures of gender disadvantage, suicide was associated with the inability to leave sex work (entrapment) but was not associated with lack of financial autonomy. This may reflect the observation that 65% of the women in our study had financial autonomy compared with 45% of women in the 2005–2006 National Family Health Survey.³⁰ The relationship between being childless and suicide may be because of social censure of childless women in India³¹; however, the life-affirming protective effect of having a child can be an alternative explanation.

In contrast with others,⁴ we found that migrant women were less likely to report suicide attempts. Non-Goan female sex workers from Karnataka follow the *Devadassi* tradition, i.e., being dedicated to the temples as young girls. Studies from Karnataka¹⁴ and our qualitative data suggest that *Devadassi* women have a more cohesive identity and are less likely to experience violence from customers and police. This is attributed to the widely held belief that *Devadassi* women are protected by the goddess *Yellamma* and should not be harmed. Goan sex workers in contrast are

extremely stigmatized and live under the daily threat of disclosure and exclusion from their communities. Other cultural differences are a less likely explanation given that religious difference was not associated with suicide attempt³. Similarly, the relationship between suicide attempt and regular paying customers may be explained by the observation that sex workers with regular customers were more likely to be part-time, work from home, and use mobile phones, suggesting a more marginalized group devoid of peer support and collective identity.

Comment [M&MQ38]: AU: attempt? Suicidal behaviors?

Comment [M&MQ39]: AU: attempt? Suicidal behaviors?

The reduced probability of suicide attempt among women who had exposure to HIV prevention interventions could be explained through a number of mechanisms. Firstly, HIV prevention is often done in groups and involves a degree of collectivization that can be protective of women's mental health. Secondly, female sex workers that access services may be a "different type" of sex worker, i.e., more empowered, more health conscious, and less disadvantaged. Thirdly, the sexual health counselor may inadvertently address psychological and social concerns during the counseling process. The lack of association between HIV and suicide attempt in our study is likely an artifact as not all study participants were aware of their HIV status and HIV testing was anonymous.

Comment [M&MQ40]: AU: attempt? Suicidal behaviors?

Our findings suggest that the key factors associated with suicidal behaviors among female sex workers are gender disadvantage (i.e., violence, entrapment, and childlessness) and a more socially isolated working environment. Although we did find an association between suicide attempt and greater depression and anxiety scores, the introduction of mental health measures into the model did not affect the magnitude of the association of other factors. This, in keeping with other studies from India,^{3,4} suggests an equal weight for underlying structural factors and mental health in determining suicidal behaviors.

Comment [M&MQ41]: AU: attempt? Suicidal behaviors?

Comment [M&MQ42]: Attempt? Suicidal behaviors?

Sub heading suggestion- strengths and limitations

The strength of this study is that we have a representative sample of female sex workers including different networks and types, many of whom had never accessed sexual health services. We used standardized and field-tested tools for the diagnosis of self-harming behaviors and sociodemographic, health, and gender disadvantage indicators, which were culturally appropriate and validated. The rest of the questions were informed by the qualitative data, translated, and extensively field-tested. To reduce selection bias we used chain sampling, where an approximate probability of recruitment can be calculated for each participant and then inverted to form weights, for an approximately unbiased analysis. However, although we are confident that the majority of networks are represented in the final sample, this is not a true probability sample survey. In particular, bias may arise in our analysis if the selection of network members for recruitment is based on factors related to outcome measures. Furthermore, the full complexity of the RDS sample is not reflected in the standard errors, and so the confidence intervals and *P* values should be viewed as approximate. This was a cross-sectional study and the direction of effect is unclear. For example, entering into violent relationships may be a manifestation of suicidal behavior and not vice versa. Sex work is a taboo within Indian society. Participants may have felt obliged to express suicidal ideation if they were engaged in such socially undesirable work. However, our qualitative study suggested that self-harming behaviors were prevalent.

Sub heading suggestion: Conclusion

Suicidal behaviors were very common in this marginalized and disadvantaged group of women. Both structural factors, relating to gender and context of sex work, and individual factors, such as poor mental health, were independently associated with

Comment [M&MQ43]: AU:
What kind of services?

suicidal behaviors. Our study findings indicate that interventions to promote the health of female sex workers must prioritize mental health and suicide prevention, along with the existing focus on HIV prevention. To reduce self-harm, our findings point to the need for a multipronged approach that includes community mobilization that organizes, empowers, and provides the means for women to collectively confront violence³² and improves access to mental health interventions for depression.⁸ The huge scale-up of HIV prevention interventions in female sex workers,¹⁰ and the seemingly protective effect of being in contact with HIV prevention services, implies that sexual health services may be the most appropriate vehicle to deliver quality mental health services to female sex workers.

Comment [M&MQ44]: Suicidal attempt or suicidal behaviors?

About the Authors

Maryam Shahmanesh is with the Centre for Sexual Health and HIV Research, University College London, England, and at the time of the study was affiliated with Positive People, St Inez, Panjim, Goa, India. Sonali Wayal is with Brighton and Sussex Medical School, Falmer, UK, and at the time of the study was affiliated with Positive People. Frances M. Cowan is with the Centre for Sexual Health and HIV Research at the University College London. David Mabey is with the clinical research unit of the department of infection and tropical disease at the London School of Hygiene and Tropical Medicine, London, England. Andrew Copas is with the Centre for Sexual Health and HIV Research at the University College London. Vikram Patel is with the department of epidemiology and public health at the London School of Hygiene and Tropical Medicine, and is affiliated with both Sangath, Porvorim, Goa, India, and Positive People.

Comment [M&MQ45]: AU: authors' titles were removed per journal style

Comment [M&MQ46]: AU: Was the London affiliation also at the time of the study?

Comment [MS47]: Yes both UCL and Positive People were at the time of the study

Comment [M&MQ48]: AU: Was the Falmer affiliation also at the time of the study?

Comment [MS49]: Sonali wayal was only associated with positive people at the time of the study

Comment [M&MQ50]: AU: the Department of?

Comment [M&MQ51]: AU: the Department of?

Comment [M&MQ52]: AU: the Department of?

Comment [M&MQ53]: The Departments of?

Requests for reprints should be sent to Dr Maryam Shahmanesh, Centre for Sexual Health and HIV Research, University College London, 3rd floor Mortimer Market

Centre, off Caper Street, London WC1E 6AU, England (e-mail:

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Comment [M&MQ54]: AU:
Only 1 e-mail address is needed.
Which would you prefer?

This article was accepted November 11, 2008.

Contributors

M. Shahmanesh designed and implemented the study and reviewed, analyzed, and interpreted the data. She wrote the first and subsequent drafts of the article. S. Wayal participated in the implementation of the study, collection and analysis of the data, and critical appraisal of all the drafts of the article. F. Cowan, D. Mabey, and V. Patel participated in the design of the study, interpretation of the data, and critical appraisal of all the drafts of the article. A. Copas supported the statistical analysis of the quantitative data and was involved in the critical appraisal of all the drafts of the article. All authors have seen and approved the final version of the article.

Acknowledgments

We are grateful to the Wellcome Trust for supporting this work through a Clinical Training Fellowship grant to M. Shahmanesh. V. Patel is supported by a Wellcome Trust Senior Clinical Research Fellowship. The design and implementation of the study was independent from the funding body and the findings do not reflect the Wellcome Trust opinions.

Comment [M&MQ55]: AU:
Is it possible to shorten the Acknowledgments section at all?

Comment [MS56]: shortened

We thank Anil Pandey and Beethoven Fonesca for administrative support to the research project and Sushila Mendoza for cleaning the data. We thank the research team at Positive People and the laboratory staff in Sangath for gathering the data. We thank the board members and staff of Positive People for supporting the study, the sex workers of Baina and Goa for participating in this study and providing stimulating and critical feedback. We thank Beryl West for training the laboratory staff and setting up the standard operating procedures and quality control monitoring and Rosanna Peeling for initial PCR training; and Dr Risbud of the National AIDS Research Institute, Pune, for quality control of our samples. We thank staff at Cornell

Comment [M&MQ57]: Poly
merase chain reaction?

University for guidance with respondent-driven sampling analysis and Ron Kessler and Rajesh Sagar for sharing unpublished validation data on the K10 mental health questionnaire. Finally, we would like to extend our thanks to the reviewers whose insightful and helpful contributions were invaluable in improving the presentation of these data.

Comment [M&MQ58]: AU: Is "K10" the full name of the questionnaire?

Comment [MS59]: yes

Human Participant Protection

This study received ethical approval from the independent ethics committee of Mumbai and the ethics committee of the University College London.

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Comment [M&MQ60]: AU: I added the year, volume number, and page numbers (from "In press" status) according to PubMed. Is this citation correct?

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Comment [ms61]: Yes this has been published (Epub ahead of publication 24th of august 2008)

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Comment [M&MQ62]: AU: Can the "in press" status be updated yet?

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Comment [M&MQ63]: AU: Is "Indian Council of Medical Research and Family Health International" part of the source's title? Or are they authors? Or something else?

Comment [MS64]: Yes they are the authors

Comment [M&MQ65]: AU: What is the publisher's city?

Comment [MS66]: New Delhi

Comment [M&MQ67]: AU: Can the "in press" status be updated?

Comment [ms68]: Yes this has been published (Epub ahead of publication 6th august 2008)

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Comment [MS70]: They are the authors

Comment [M&MQ71]: AU: Is "Evidence Prepared for John D and Catherine T MacArthur Fund for Leadership Development, India" part of the source's title? Who is the publisher and what is the publisher's city?

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Comment [ms72]: The source title is Mental health, pregnancy and child birth: Evidence. The publishers would be John D and Catherine T MacArthur Fund for leadership Development, India and the publisher city should be New Delhi. However I do not have a copy of this report with me at this time and so it may be better to replace this reference with a personal communication from Sonali Wayal in the text

Note. STI=|sexually transmitted infection.

FIGURE 1—A conceptual framework for social risk factors for suicide in female sex workers in India

Comment [M&MQ73]: AU: Does this figure refer to female sex workers in general, or specifically to those in Goa, India?

TABLE 1—Association Between Sociodemographic Factors and Suicide Attempt in a Cross-Sectional Survey of Goa, India–Based Female Sex Workers, December 2004–December 2005

Factor	No. (Weighted %)	Prevalence of Suicide Attempts in Past 3 Months, No. (Weighted %)	Univariate Odds Ratio (95% Confidence Interval)	P	Base Model, Adjusted Odd (95% Confide Interval)
All	325 (100)	73 (18.7)			
Age, y				.01	
[ems]< 20	35 (8.6)	17 (41.5)	1		1
[ems]21–25	100 (29.0)	22 (18.5)	0.32 (0.13, 0.76)		0.44 (0.17,
[ems]26–30	78 (25.5)	11 (10.8)	0.17 (0.07, 0.45)		0.29 (0.10,
[ems]31–35	43 (13.8)	10 (21.1)	0.38 (0.14, 1.04)		0.75 (0.23,
[ems]≥ 36	69 (22.9)	13 (17.7)	0.30 (0.12, 0.77)		0.63 (0.20,
Ethnicity				<.001	
[ems]Goan	54 (11.2)	23 (39.7)	1		1

[ems]Karnataka	200 (72.0)	28 (13.3)	0.23 (0.12, 0.46)		0.26 (0.11,
[ems]Other Religion	71 (16.8)	22 (28.2)	0.60 (0.28, 1.27)	.01	0.62 (0.25,
[ems]Non-Hindu	102 (27.5)	41 (27.4)	1		1
[ems]Hindu Literacy	223 (72.6)	32 (15.5)	0.48 (0.28, 0.85)	.12	0.66 (0.34,
[ems]Literate	71 (18.1)	21 (25.4)	1		
[ems]Not fully literate Schooling	254 (81.9)	52 (17.3)	0.61 (0.33, 1.14)	.01	
[ems]None	252 (67.3)	33 (15.1)	1		
[ems]Any Marital status	73 (32.7)	40 (26.3)	2.01 (1.16, 3.48)	.5	
[ems]Never married	91 (28.4)	24 (20.2)	1		
[ems]Married	134 (40.3)	30 (20.5)	1.02 (0.53, 1.95)		
[ems]Separated or widowed In debt	101 (31.3)	19 (15.2)	0.70 (0.35, 2.00)	.5	
[ems]No	156 (45.4)	39 (20.3)	1		
[ems]Yes Homeownership	169 (54.6)	34 (17.4)	0.83 (0.48, 1.43) 0.16		
[ems]Yes	124 (36.8)	35 (22.7)	1		
[ems]No Support dependents	201 (63.2)	38 (16.5)	0.67 (0.39, 1.17)	.09	
[ems]No	43 (11.3)	29 (28.9)	1		
[ems]Yes Number of children	282 (88.7)	14 (17.5)	0.52 (0.25, 1.09)	<.001	
[ems]None	72 (19.3)	30 (37.6)	1		1
[ems]1 or more	254 (80.7)	43 (14.2)	0.28 (0.15, 0.50)		0.36 (0.17,
Duration in Goa				.01	

[ems]1 year or less	42 (11.6)	16 (31.1)	1
[ems]2–10 y	99 (30.1)	14 (13.5)	0.35 (0.15, 0.83)
[ems]More than 10 y	92 (33.5)	13 (12.9)	0.33 (0.14, 0.80)
[ems]From birth	92 (24.8)	30 (27.2)	0.83 (0.37, 1.83)

TABLE 2—Association Between Sex Work Factors and Suicide Attempt in a Cross-Sectional Survey of Goa, India–Based Female Sex Workers, December 2004–December 2005

Variable	No. (Weighted %)	Prevalence of Suicide Attempts in Past 3 Months, No. (Weighted %)	Adjusted Odds Ratio (95% Confidence Interval) ^a
Time in sex work, y			
[ems]<1	105 (29.6)	28 (22.8)	1
[ems]2–10	144 (42.4)	37 (21.9)	1.02 (0.50, 2.08)
[ems]>10	76 (28.0)	8 (9.6)	0.43 (0.16, 1.11)
Having ever worked in the Baina red-light area	124 (44.6)	14 (10.3)	0.37 (0.16, 0.84)
Income from source other than sex work	140 (44.1)	30 (18.7)	1.29 (0.67, 2.48)
Location of sex work			
[ems]Street-based sex work	77 (22.8)	15 (17.9)	1.13 (0.53, 2.39)
[ems]Establishment (lodge, bar, or brothel)–based sex work	191 (57.6)	46 (19.8)	0.86 (0.41, 1.81)
[ems]Home-based sex work	89 (28.1)	21 (19.9)	1.38 (0.67, 2.84)
Number of customers per week			
[ems]Less than 1	123 (38.4)	20 (13.1)	1
[ems]1–7	179 (56.4)	43 (20.5)	1.84 (0.96, 3.51)
[ems]More than 7	23 (5.2)	10 (41.5)	4.27 (1.30, 14.07)
Number of regular customers 1 or more regular customers	139 (40.1)	47 (29.5)	2.93 (1.57, 5.44)
Consistent condom use with customers	236 (74.2)	47 (16.5)	0.56 (0.28, 1.13)
Income from customer (per \$2.5 increase in payment)			1.05 (0.97, 1.14)
Started sex work at age 16 or	64 (20.8)	17 (21.4)	1.09 (0.49, 2.43)

Comment [M&MQ74]: AU: <1 to 2-10 skips 1 year. Should it be ≤1 year?

Comment [MS75]: Yes

Comment [M&MQ76]: AU: Can you suggest a subheading for above this line?

younger			
No regular nonpaying male partner	78 (24)	16 (19.3)	0.86 (0.42, 1.78)
Change in regular partner over the past 3 months	19 (5.4)	5 (22.2)	1.02 (0.27, 3.90)

^aAdjusted for baseline factors (age, ethnicity, religion, and number of children).

TABLE 3—Association Between Autonomy, Social Support, Violence, and Suicide Attempt in a Cross-Sectional Survey of Goa, India–Based Female Sex Workers, December 2004–December 2005

Variable	No. (Weighted %)	Prevalence of Suicide Attempts in Past 3 Months, No. (Weighted %)	Adjusted Odds Ratio (95% Confidence Interval) ^a
Autonomy			
[ems]Political empowerment ^b	169 (55.0)	33 (33.6)	1.01 (0.51, 2.05)
[ems]Entrapment ^c	296 (90.7)	63 (28.1)	2.54 (1.01, 6.44)
[ems]No financial autonomy	106 (35.0)	25 (19.0)	1.45 (0.77, 2.75)
Coerced unsafe sexual relations with customer	95 (26.9)	33 (30.3)	1.85 (0.96, 3.55)
Social support			
[ems]Recent lack of emotional support	196 (60.0)	50 (21.5)	1.67 (0.90, 3.14)
[ems]Turn to intimate partner for support	65 (19.5)	12 (14.9)	0.69 (0.33, 1.42)
[ems]Turn to family for support	21 (6.2)	3 (10.2)	0.43 (0.12, 1.57)
[ems]Turn to other female sex workers for support	114 (35.2)	27 (20.2)	1.21 (0.64, 2.31)
Violence			
[ems]Police raid, past year	50 (14.0)	18 (30.8)	1.99 (0.95, 4.18)
[ems]Intimate partner verbal abuse, current	108 (29.7)	40 (33.2)	2.99 (1.63, 5.49)
[ems]Intimate partner physical abuse, current	104 (29.8)	38 (31.8)	3.00 (1.60, 5.62)
[ems]Any intimate partner violence, current	124 (35.1)	43 (30.5)	3.13 (1.59, 6.17)
[ems]Violence from others, current	69 (18.9)	29 (35.9)	2.69 (1.41, 5.11)
[ems]Lifetime sexual violence	36 (8.9)	18 (46.9)	2.88 (1.17, 7.13)
[ems]Childhood sexual abuse	18 (4.6)	7 (41)	2.21 (0.58, 8.39)

^aAdjusted for baseline factors (age, ethnicity, religion, and number of children).

^bEver voted in an election.

^cNot free to leave sex work.

TABLE 4—Association Between Health-Related Factors and Suicidal Behavior in a Cross-Sectional Survey of Goa, India–Based Female Sex Workers, December 2004–December 2005

Variable	No. (Weighted %)	Prevalence of Suicide Attempts in Past 3 Months, No. (Weighted %)	Adjusted Odds Ratio (95% Confidence Interval) ^a
Sexual health			
HIV knowledge score			1.0 (0.96, 1.04)
Exposure to sexual risk reduction interventions			
[ems]Lifetime	110 (38.5)	17 (12.4)	0.54 (0.27, 1.05)
[ems]Past 3 months	55 (19.3)	28 (16.3)	0.25 (0.10, 0.68)
Lifetime induced abortions	90 (24.9)	28 (16.3)	0.84 (0.45, 1.59)
Infertility over past year	47 (14.8)	15 (29.8)	2.00 (0.91, 4.41)
Presence of sexually transmitted infections			
[ems]Chlamydia, trichomonas, or gonorrhea	75 (22.0)	25 (22.9)	1.17 (0.59, 2.32)
[ems]HIV	77 (25.8)	14 (16.0)	0.95 (0.46, 1.93)
[ems]Herpes simplex 2	180 (57.1)	39 (18.2)	0.97 (0.53, 1.78)
Substance use			
Alcohol			
[ems]Never	137 (42.9)	33 (21.2)	1
[ems]Less than weekly	23 (6.2)	9 (31.0)	1.23 (0.43, 3.50)
[ems]At least weekly	165 (50.9)	31 (15.2)	0.57 (0.30, 1.11)
Gutka (chew tobacco)			
[ems]Never	165 (47.6)	43 (31.2)	1
[ems]Less than weekly	21 (6.7)	5 (19.1)	1.41 (0.37, 5.33)
[ems]At least weekly	139 (45.7)	25 (16.2)	1.07 (0.55, 2.09)
Smoke tobacco			
[ems]Never	290 (91.5)	58 (16.9)	1
[ems]Less than weekly	10 (2.4)	4 (27.3)	1.09 (0.26, 4.58)
[ems]At least weekly	25 (6.1)	11 (43.0)	1.97 (0.68, 5.67)

^aAdjusted for baseline factors (age, ethnicity, religion, and number of children).

Comment [M&MQ77]: AU: Tobacco?

TABLE 5—Multivariate Analysis of the Determinants of Self-Reported Suicide Attempt in the Past 3 Months Among Goa, India–Based Female Sex Workers, December 2004–December 2005

Factor ^a	Adjusted Odds Ratio of Final Model ^b (95% Confidence Interval)	<i>P</i>	Adjusted Odds Ratio ^c of Final Model Including Proxy Measures of Mental Health (95% Confidence Interval)	<i>P</i>
Age, y		.1		.07
[ems]<20	1		1	
[ems]21–25	0.47 (0.16, 1.37)		0.36 (0.12, 1.09)	
[ems]26–30	0.28 (0.08, 0.97)		0.25 (0.07, 0.87)	
[ems]31–35	0.95 (0.23, 3.93)		0.81 (0.19, 3.47)	
[ems]≥36	0.65 (0.18, 2.31)		0.67 (0.20, 2.29)	
Ethnicity		.02		.01
[ems]Goan	1		1	
[ems]Karnataka	0.41 (0.18, 0.93)		0.47 (0.20, 1.07)	
[ems]Other	1.13 (0.45, 2.85)		1.04 (0.37, 2.93)	
Hindu	0.74 (0.36, 1.51)	.4	0.81 (0.39, 1.69)	.6
At least 1 child	0.41 (0.17, 0.96)	.04	0.39 (0.17, 0.91)	
Intimate partner physical abuse	2.81 (1.45, 5.45)	.002	2.53 (1.29, 4.98)	
Violence from others	2.29 (1.16, 4.54)	.02	2.08 (1.05, 4.12)	
Entrapment ^d	2.48 (1.01, 6.08)	.047	2.41 (0.97, 6.01)	
1 or more regular customers	2.70 (1.40, 5.23)	.003	3.08 (1.52, 6.26)	.002
At least 1 customer per week	1.85 (0.93, 3.69)	.08	1.62 (0.79, 3.43)	.2
Exposure to sexual risk reduction counseling in past 3 months	0.29 (0.10, 0.88)	.03	0.30 (0.10, 0.87)	.03
Measure of poor mental health			1.06 (1.01, 1.11)	.02

^aOnly variables that remained in the model after multivariate logistic regression are reported in this table.

^bAdjusted for age, ethnicity, religion, number of children, time in sex work, ever worked in Baina red-light area, number of customers per week, number of regular customers, payment per customer, entrapment, lack of emotional support, police raid, intimate partner physical violence, intimate partner verbal violence, violence from

Comment [MS78]: These are three separate variables measuring gender disadvantage

Comment [M&MQ79]: AU: Could you suggest a heading or headings for the factors below this line?

others, lifetime sexual violence, coerced unsafe sexual relations, recent exposure to HIV prevention interventions, infertility, and alcohol use.

^cAdjusted for variables in footnote “b” plus **K10** mental health score.

^dNot free to leave sex work.

Comment [M&M080]: AU:
Is K10 the full name of the questionnaire?

Comment [MS81]: yes

HIV prevention while the Bulldozers roll: A study exploring the effect of the demolition of Goa's red-light area

Word count: 8012

Abstract

Interventions targeting sex workers are pivotal to HIV prevention in India. Community mobilisation is considered by the National AIDS Control Programme to be an integral component of this strategy. Nevertheless, societal factors, and specifically the legislation around sex work are potential barriers to widespread collectivisation and empowerment of sex workers. Using participatory observation, rapid ethnographic mapping, and in-depth interviews, we provide a detailed account of the demolition of Baina, one of India's large red-light areas, in 2004. We provide one of the first accounts of the effect of dismantling the red-light area on the organisation of sex work and female sex workers' sexual risk. The results suggest that sex work was adaptive to changing circumstances. A concentrated and homogeneous brothel-based sex work environment rapidly evolved into heterogeneous, clandestine and dispersed modes of operation. However, the social context of sex work that emerged from the dust of the demolition was higher risk and less conducive to HIV prevention. The demolition seemed to act as a negative structural intervention; a catastrophic event that fragmented FSWs collective identity and agency and rendered them voiceless and marginalised. Yet, the creative ways in which the women adapted to their hostile and high-risk environment showed a degree of independent action that a purely structural analysis of the post-demolition risk environment would not explain. The findings suggest that an ambiguous approach to the rights of sex workers and legislation that, either criminalises this large group of women, or renders them as invisible victims, will increase the stigma and exclusion they experience. For the targeted HIV prevention approaches advocated by the National Programme to be effective, there is an urgent need for legislation and policy that supports sex workers' agency and self organisation, and enable them to create a safer working environment for themselves.

INTRODUCTION

The HIV epidemic in India, the world's second most populous country, is of global importance (Chandrasekaran et al., 2006). India's epidemic is concentrated in groups with higher rates of risk behaviour; i.e. core groups. Targeting these vulnerable populations is considered pivotal to HIV prevention in India (National AIDS Control Organisation, 2006). With an estimated 0.6-0.7% of the adult urban female population engaged in transactional sex, female sex-workers (FSWs) are an important core group (Chandrasekaran et al., 2006). In fact it has been claimed that prevention interventions in FSWs alone could halt the HIV epidemic in India (Nagelkerke et al., 2002).

There is growing evidence that a range of psychosocial and community-led processes underlie an individual's ability to access and adopt behaviours such as "abstinence, being faithful and using a condom" (Blanchard et al., 2005; Blanchard et al., 2007; Campbell, 2000; Kerrigan et al., 2003). Acknowledging the role of structural factors in sexual behaviour change has led to constructs such as "high risk environments" replacing "high risk groups" (Desmond et al., 2005; Wight et al., 2006). Hierarchical conceptual frameworks have been constructed to define levels of "risk causation" e.g. societal (super-structural), community (structural), institutional (infrastructural), and individual (Sweat & Denison, 1995). Moreover, by describing and understanding the upstream contextual factors determining FSWs sexual risk, interventions can be tailored to alter the "risk environment". An example of this evidence-based approach can be seen in Northern Karnataka, where the finding that traditional "Devadassi" sex workers are more stable, experience less violence and stigma, and are less likely to be controlled by pimps and brothel owners, informed collectivisation of the FSWs as a more appropriate strategy than one which targeted gatekeepers (Blanchard et al., 2007; O'Neil et al., 2004; Halli, Ramesh, O'Neil, Moses, & Blanchard, 2006).

Interventions may be situated at level of society (structural), or community (participation and empowerment) or the individual (cognitive and behavioural) (Boerma & Weir, 2005). The 100% condom use programme in Thailand was an example of an intervention at societal level; state apparatus was utilised to penalise "high risk behaviours" and encourage "low risk behaviours" (Hananberg & Rojanapithayakorn, 1996; Hananberg, Rojanapithayakorn, Kunasol, & Sokal, 1994). Although the impact and effect is mediated through changes at the community and individual level, the site of the intervention was societal. Interventions implemented through community mobilisation, such as the Sonagachi Project, are examples of interventions at a community level, and in their idealised form lead to gradual shifts in socially acceptable behaviours (Jana et al., 1998). The seemingly democratic nature of change that community action implies has led to widespread endorsement of empowerment as part of health promotion (Halli et al., 2006; Campbell, 2000).

If empowerment is a process of politicisation, wherein a FSW moves from consciousness, to knowledge to action (i.e. group identity to efficacy to agency), the role of the social context becomes immediately apparent. On the one hand the very conditions of marginalisation and violence could constitute insurmountable barriers to empowerment (Asthana & Oostvogels, 1996). On the other hand studies suggest that FSWs are able to express their agency, albeit through small and incremental

gains(Cornish & Ghosh, 2007; Campbell, 2000). There is therefore a complex and dialectical, rather than mechanical and unidirectional relationship between society, community and the individual.

Nevertheless, collectivised and empowered sex workers remain the exception rather than rule. The extent, to which this reflects a failure to tackle societal factors, and specifically legislation around sex work, is the main thesis of this paper.

The Immoral Trafficking Prevention Act (ITPA) regulates sex work in India. Whilst the act does not prohibit prostitution per se, prostitution carried out in a brothel or within 200 metres of certain public places, is a criminal offence. On 14th June 2004, the Government of Goa demolished Baina red-light area(Shahmanesh & Wayal, 2004). Since the demolition of Baina several high profile closures of red-light areas and dance bars have taken place in India. In all cases, the settings were governed by populist religious (Hindu) fundamentalist political parties at the time of the closures and evictions. The Lok Sabha (the Indian parliament) is currently discussing amendments to ITPA, which will penalise the purchase of sexual services, i.e. criminalise clients (PRS Legislative research, 2008). Although anti-prostitute, anti-migrant and public health rhetoric was used to justify the demolitions and evictions, they were only possible because of the ambiguous legislation around sex work, which will be compounded further by criminalisation of purchasing sex. There is therefore an urgent need to describe the impact of these structural changes on FSWs “risk environment” to inform the public debate.

In this paper we will describe the course of events in Goa relating to the demolition as this exemplifies policies that potentially force FSWs into more clandestine and invisible types of transactional sex. The events will be described from the perspective of the community with a particular focus on those aspects that affect the practice of sex work, the FSWs collective identity, their sexual health and the overall “risk environment”.

Background to the demolition

Goa is a small coastal state with a population of 1.37 million and its main sources of income are tourism, fishing and mining(Government of Goa, 2007; Government of India, 2001). The State has more than 1.5 million domestic and international tourists visiting annually, and a corresponding number of seasonal economic migrants making the most of employment and market opportunities. With such a major influx of seasonal visitors Goa has a well-established and large population of predominantly migrant FSWs.

Baina beach, situated in Goa’s largest port, Vasco da Gama, had been a renowned red-light area since the early 1960s. By 2003 this small, well-demarcated slum of 0.09km² had become home to 6 - 7,000 people and around 2,000 FSWs. The majority of people living in Baina had migrated in different waves from neighbouring Karnataka and more distant Andhra Pradesh. Nevertheless, many had resided in Baina for more than three decades.

On 14th June 2004, using a High court order, the Government of Goa demolished the red-light area. The process culminating in the demolition had been set in motion the

previous year. July 2003 saw the withdrawal of alcohol licences from the bars and restaurants along Baina beachfront. In Christmas 2003, a police cordon was placed around Baina that effectively stopped clients from entering the red-light area. Although non-governmental-organisations (NGOs) mounted a campaign to repeal the High Court order, or ameliorate its effects, they were constrained by their own ambivalence towards sex work. In June 2004, the red-light area was formally demolished, no rehabilitation or relief was provided for the women and a decade of HIV prevention activities was brought to an abrupt close.

The HIV prevention interventions that the women were exposed to prior to the demolition were implemented through four NGOs, funded by the National AIDS Control Organisation, and two internationally-funded organisations. The interventions provided a composite of sexual risk reduction counselling, delivered through outreach workers and peer educators, free condoms and sexually transmitted infections (STI) treatment for symptomatic women. One NGO provided training for alternative employment and legal services for the women. Routine surveillance suggested a pre-demolition HIV prevalence of 30-50% in Baina FSWs {Goa State AIDS Control Society, 2006} and high levels of HIV awareness and condom use {National AIDS Control Organisation, 2007}. At the time of the demolition we were engaged in a study to develop a participatory evidence-based HIV prevention intervention. It was quickly apparent that the dispersion and marginalisation of the women following eviction would impact upon the type of HIV prevention interventions that could be implemented. The aims and objectives of the study were therefore expanded to include a description of the effect of the eviction on organisation of FSWs, and their vulnerability to HIV.

METHODS

Study design and setting

The study was conducted in three phases. The pre-eviction phase ran from November 2003 to June 2004 and was an ethnographic study documenting the effect of the police cordon in the run up to and process of the eviction. The early post-eviction phase (June 2004-December 2004) consisted of rapid ethnographic mapping of the temporal, spatial and social organisation of sex work in the immediate aftermath of the demolition. Finally the late post-eviction phase (December 2004-December 2005) was an in-depth qualitative study of FSWs to determine the impact of the demolition on their lives and risk behaviours.

The study was implemented through an organisation called Positive People. This was the first NGO that had provided targeted HIV prevention interventions for FSWs in Goa. A team employed specifically for this purpose conducted the research. They had separate offices and separate administrative and management structure to the service providers within Positive People. Pre-demolition the study was based in Baina red-light area. Following the demolition the study site expanded to include all urban settings, migrant slums, and the coastal tourist belt of Goa.

The research team

A team of thirteen male and female researchers, aged between twenty and fifty, from diverse educational, social, religious and ethnic backgrounds, were recruited. Collectively the team could speak eight Indian languages and included members of all the key migrant groups from Karnataka, Andhra Pradesh, Kerala, and Maharashtra. In November 2003 there were two researchers including one of the authors (MS). In March a further four researchers, including co-author SW, joined the team. In September 2004 two of the six researchers left for personal reasons and seven new researchers were recruited. The team of eleven continued until the end of the research period.

Study population

FSWs were defined as women who are currently providing sexual services in exchange for goods or money. Key informants were defined as people who worked in close proximity to sex-work or were knowledgeable about their locality and included health-professionals, bar and lodge-owners, other sex workers, gharwalis (female brothel-owners), pimps, motorcycle-taxis, rickshaw and taxi drivers, security-guards, NGO workers, shop-keepers, paan wallahs (beetle nut sellers), street vendors, security guards, and local leaders.

Details of each phase of the study

Pre-eviction

Data were collected using a mixture of participatory observation (PO), serial interviews and group discussions with key informants. A team of six researchers including MS and SW were based in the area for the months preceding the demolition. They remained in Baina throughout the demolition and its aftermath. The team engaged FSWs, gharwalis, NGO peer educators, pimps and local politicians in Baina in informal interviews and group discussions. Several key informants were re-interviewed on a daily, weekly or opportunistic basis. The questions evolved to inform and develop a narrative of the run up to the eviction from a range of perspectives.

Early post-eviction

Eleven researchers, including SW, mapped the urban centres, migrant slums and coastal belts. They drove and walked through each area marking parks/beaches, temples/mosques/ churches, pharmacies, health facilities (clinics & hospitals), traditional healers, paan-wallahs, trinket-sellers, hotels, bars, wine-shops, alcohol drinking spots, restaurants, truck halt points, factories, construction sites, motorcycle taxi and rickshaw stands, bus stands, official buildings and schools/colleges. Site inventories were completed for each area detailing the population size (stable and transient), social class, major sources of employment, the presence or absence of vulnerable populations such as migrants, truckers, fishermen, tourism-related workers, types of housing, and presence of NGOs and other social welfare groups working in the area. PO and informal key informant interviews were conducted to identify health problems, leisure activities for young men, the type and number of sex workers, where, when and how they worked, how they found customers, who were the clients, and how this picture changed after the demolition of Baina. This mapping

data was recorded in Field Notes (FN) and discussed in team meetings on a weekly basis and was incorporated into the next phase in an iterative way, i.e. the data were verified, refined or refuted by information from key informant interviews. During the mapping interviews a sub-group were identified for open-ended semi-structured key informant interviews (KII). The selection of key informants was based on knowledge about sex work in their locality, the rapport with the interviewer, and purposive selection of different types of informants from a wide range of locations. Focus group discussions (FGD) were conducted with occupational groups identified as clients and mediators: fishermen, truckers and motorcycle taxi-drivers.

Late post-eviction

FSWs were purposively selected to include the range of sex-work identified during mapping as well as different ages, ethnicities, areas of work, and HIV status. SW conducted in-depth interviews (IDI) with the FSW. The interviews took place in a variety of private settings, including a community centre, NGO offices and rented rooms. Three core topic areas were explored during the interview: their experience of sex work, the impact of the eviction on their working practices and sexual risk (including non-Baina sex workers), and their perception and understanding of HIV and STIs. The first part of the interview consisted of a detailed life history. The second part concentrated on their current working and living conditions and any changes since the demolition. The third part contained specific probes relating to security and violence, sexual and mental health, HIV and its prevention, and health beliefs.

Data management and analysis

Informants were interviewed during approximately 5000 hours of participatory observations with several hundred informants. Field researchers kept a daily record of their observations, serial informant and brief mapping interviews in their FN, which were transcribed on a monthly basis. Maps were drawn of the area and then supplemented using an inventory to collect additional data in a systematic manner. Sixteen IDI with FSWs and 34 KII were tape-recorded, transcribed, translated and then checked by the interviewer against notes taken during the interview. Three FGD's were transcribed from the tape recording with the aid of an observer's notes. GA provided quality control and feedback through regular review of the tape-recordings.

The qualitative data were entered into NVivo 2 (QSR International Ltd, Melbourne, Australia). MS, SW and GA performed the coding and analysis. They each coded the data independently and resolved discrepancies through discussion. The qualitative data were analysed by allowing concepts to surface from the raw data. These were then grouped in broad thematic headings and sub-headings.

Community engagement and ethics

Two core themes run through this important aspect of our study. One was the process of engaging the community to participate in the study design and implementation and the second was advocacy to prevent the demolition and in support of the FSWs human rights.

The team of nine peer educators, six of which were ex-Baina sex workers, were trained to disseminate the study aims and objectives as well as to provide the interface between the research team and the community. The research team raised community awareness through meetings with gatekeepers, flipchart presentations and group discussion with the FSWs. Engagement with the community was institutionalised through the community advisory board, which held its inaugural meeting two weeks before the demolition.

Ethical approval was obtained from the Independent Ethics Commission, Mumbai and University College London's ethics committee. All participants and their partners were offered presumptive treatment for bacterial STIs as well as treatment based on laboratory tests. Voluntary counselling and testing for HIV, treatment for STIs, and HIV risk reduction counselling were available throughout.

RESULTS

The demolition

Pre-demolition

Prior to the demolition, Baina sex work was divided into independent sex workers and those who were worked with gharwalis, either on contract or on commission. This corresponded broadly, but not exclusively, to both the ethnic and geographical division of the red-light area into Andhra and Karnataka sides. The Andhra side consisted of around sixty gharwalis who contracted young women from Andhra Pradesh. The income from these FSWs would exclusively belong to their gharwalis, for the contracted period. This was the time during which they were expected to earn back their brokerage fee (the sum of money that had been paid by the brokers to the FSWs families). Time taken off for menstruation or sickness, and the costs incurred through living expenses were added to the total. The gharwalis in return were responsible for health, lodgings, and finding customers. Once the debt was fully repaid the girl either remained with the gharwali and shared her income, or became a gharwali, or rented a room and worked independently. On the Karnataka side the FSWs were often traditional sex workers (Devadasis), dedicated to the temple and had thus entered prostitution at a young age. They were usually independent, paying a small commission to the gharwalis from whom they rented rooms and the pimps who supplied their customers. Occasionally a group of independent FSWs would join together to save money on room rental and commission. The accounts from the women high-lighted the pre-existing tensions between the newer, more 'professional' contract FSWs and the older, traditional FSWs. This tension was often expressed in ethnic terms.

Siege conditions

It was against this background that the police cordon was placed around Baina during December 2003. Police blocked the various routes into the red-light area and continuously patrolled the beach. The tactic used to enforce the siege was to punish customers visiting Baina. This took the form of beating, threats of arrests, demands for bribes and public humiliation, such as being forced to do "sit ups" in front of the

FSWs and NGO workers. Soon the harassment extended to the whole community; women and men described a barrage of abuse even when returning from the market or hospital.

The official reason given for the police cordon was to “prevent criminal elements from functioning in the area”. However, the community believed that the “real goal” was to force the sex workers to “run away”. The relationship with the police during the siege was frequently juxtaposed with memories of a more amicable and symbiotic relationship, as this IDI with an ex-Baina-SW describes,

“The old people [police] were good... Those old people never used to talk to girls. They were doing their duty well. But the newly arrived police ... beat customers and extort money from them... [and] sleep with the girls.... The earlier police were very good; if a hooligan came or a fight broke out they used to arrive on the scene immediately after the fight and used to catch the culprit. But the new police arrive one hour after the crime... They started this when Baina was about to be closed.”

Lost income

A common theme in interviews and FN was the severe loss of income for both FSWs and those on the periphery. The worst affected were the independent sex-workers who were wholly reliant on customers who came to the red-light area. These women would describe their hunger in vivid terms, complaining to the field workers that they were starving and unable to even afford the small sums required for a plate of “idlis” (a traditional south Indian breakfast). The reduced income from sex work reverberated throughout this interconnected community. Older sex workers and peer educators who had relied on renting out their rooms to the independent FSWs, no longer found their rooms to be in demand. The bars and restaurants where the women spent their earnings and entertained their customers were now deserted. The destitute women who eked a meagre living from washing the FSWs’ clothes or selling trinkets, and the motorcycle taxis who made lucrative business from the commissions and tips received from FSWs and satisfied customers, all found themselves without income. In the words of one of the women who washed clothes for a living,

“It has hit us in our stomach very badly. Now [the girls] don’t have anything to offer, so, how can they give me? If they had something then they would be in position to share it with me.... If they had some work, then they would employ four persons.... but if they don’t have work then how can they feed me? If they have something then they would give me ten to twenty rupees and I would fill my stomach. They were providing the money for our house rent, clothes and food and somehow we could have our meals.... But now, who can give us all this?”

Uncertainty

The pressure of lost income was made worse by the “overwhelming feeling of uncertainty” that pervaded Baina in the run up to the demolition. The “waiting game” led to unease, stress and despair amongst the Baina community. The insecurity was exacerbated by the complex array of messages imparted by the authorities. The government delegated two NGOs to enumerate and register the FSWs, and provide them with photo-identification to collect weekly rice and lentil rations. On the one hand the FSWs understood that if they did not register they would not be eligible for the pledged “rehabilitation package” and on the other hand, once registered, they were

threatened with severe penalties if they were found to be practicing sex work. Rumours circulated that the registration and rations were a ruse to identify and blacklist practising FSWs in preparation for the demolition. The women became increasingly suspicious as they found themselves placing their fingerprint against a growing number of incomprehensible official documents and surveys,

“Every day there is a new thing and a new idea about who will be rehabilitated. [We are] very confused and scared” (FN)

Their powerlessness was exacerbated by structural factors that excluded FSWs from the decision making process. Many of the advocacy meetings held with politicians or the public were in English. This created a clear language barrier for the FSWs as the majority spoke only their regional language and a minority spoke Hindi. Even when translation was available the hierarchical nature of the seating and discussion prevented all but the most senior community members from speaking. The voicelessness of the women in such public gatherings was in stark contrast with the articulate and boisterous group discussions recorded in the FN and during the community advisory board meetings.

The community became dependent on the more educated NGO workers and researchers to decipher and translate the complex processes that were engulfing them. The inequality of this dependency on young, female NGO workers, often from a higher caste and more affluent class became a source of tension.

Competition

The extreme competition for the few available customers heightened the ethnic tensions and divisions between the contract FSWs from Andhra Pradesh and independent FSWs from Karnataka. The latter were convinced that “the police took money from the Andhra side gharwalis and let customers in that area”, while the independent Karnataka women starved. The gharwalis with the largest number of women were seen as having better connections with the police and therefore viewed as better able to bribe the police.

“One girl on Karnataka side [was] angry and violent shouting ‘the Andhra Gharwalis are making their girls do oral sex and so all the clients are going to them’. Shouting at the NGOs for not doing anything [she said] ‘they [the AP side] have chicken Biryani and beer whilst we have nothing’” (FN)

Deserted Baina

The “padlocked cubicles” and the “deserted lanes” of the red-light area were testimony to the reduced number of FSWs in Baina. A researcher who had previously worked in Baina as a photographer recorded the following passage in his diary,

“In the month of February 2004 [Baina] was an entirely different place compared to what I had seen earlier as a photographer between 1989 and 1997. In those days Baina used to be full of people and full of activity. I saw so many different types of people coming to Baina They spent lots of money. Baina had never been as sad as how I saw it in February 2004”. (FN)

A fall in contract girls from Andhra Pradesh was considered to be the reason for the overall reduction in FSWs. Peer-educators noted a dramatic decrease in the number of FSWs on the trains from Andhra Pradesh. FSWs explained that rumours of Baina's potential demise had reached the Andhra villages causing brokers to divert their trade to Mumbai and other red-light areas.

Movement for work

To continue to work during the police siege required women to meet the clients outside of the red-light area. Those who had regular customers or contacts with pimps could arrange such rendezvous. Mobile phones, which had not previously been required, became an important modality of sex work.

One particular form of mobility that blossomed during the police siege was short (10-14 days) working trips to lodges in Goa and neighbouring States, called "dates", described here in an IDI with an ex-Baina sex-worker,

"Because Baina was closed, we started going out for dates for the sake of survival... [Otherwise] we would have died of starvation... [Since] the whole thing was banned by police."

These 'dates' to unknown lodges were particularly frightening for the Baina sex workers who had rarely ventured outside of Baina.

The demolition

On 14th June 2004, following the FSWs unanimous rejection of an attempt to "forcibly rehabilitate", the bulldozers demolished the red-light area and part of the neighbouring slum. It was during the first of the monsoon rains and no relief was provided for the several thousand families made homeless overnight. The uncertainty and disbelief meant that many had not even removed their valuables from their homes. Documents and gold jewellery were amongst the many items that lay buried under the rubble as men, women and children fled the bulldozers.

Early post-demolition

Several of the families continued to camp out in the rubble of the demolition whilst some moved into the slums of the immediate vicinity. There was considerable animosity towards the FSWs who were blamed by the community for the demolition. So the FSWs hid amongst the "family people", camouflaged by exchanging the modern "jeans and makeup", associated with sex work with the more traditional "sari".

For the women who escaped Baina the situation remained equally precarious. Many key informants suggested that Baina women had "scattered" throughout Goa. However in practice, community antagonism to Baina women, police harassment, and "fines" for those who accommodated FSWs, discouraged ex-Baina-FSWs from resettling in Goa. The FN provide a graphic testimony to this as the research assistants describe arriving at one place after another in search of the evicted sex workers only to realise that they had already left, "driven out" by either police or a

vigilant community. There was a striking similarity to the accounts coming from various parts of Goa.

“If you mean like the Baina business, there is no such business here. Immediately after the demolition [Baina sex workers] came here and stayed. But the police soon came to know about it and... sent them away. The police collected a fine of Rs.500 from each sex worker and the people who accommodated her.” (KII)

Women either “hid” amongst communities or repeatedly relocated to avoid recognition. The fear of punishment should they be seen as aiding and abetting Baina sex-workers, led the adjacent communities, to be particularly vigilant in preventing sex workers from resettling. The ethnic tensions flowed over into the post-demolition period with Andhra sex workers being the group most likely to be targeted and stigmatised. The majority of Andhra Pradesh women were forced to leave Goa and relocate to other red-light areas.

Almost all the gharwalis relocated, as they were unable to continue the brothel-based sex work in the more hostile atmosphere of post-demolition Goa. Moreover, although the majority of gharwalis had lived in Goa for decades, it was the slums of Baina to which they had moved: a tightly knit community that they were familiar with. The rest of Goa was an alien space that they were afraid to negotiate their way around. Despite the decades that they had lived in Goa, none of them spoke Konkani, the native language. Baina gave them a recognisable identity, albeit a stigmatising one,

“Earlier there was Baina so we could give this address... If we were caught, the police would know that we are from Baina and they would release us after bringing us here, but now since there is no Baina, where can we claim to be our place if we are caught?” (IDI ex-Baina SW)

The women felt betrayed and disillusioned. During the IDIs all the ex-Baina sex-workers reminisced nostalgically of their previous life in Baina and the money they could earn. They described the demolition as a “kick in the stomach” and Baina developed a mythical status,

“Oh, what money [I had]... I hired a room for seventy rupees (US\$1.50) a day...every morning I would give this amount... Just calculate the monthly rent of such a room!” (IDI ex-Baina-SW)

Late post-demolition

The demolition of Baina red-light area destroyed the homogeneous brothel-based sex work that was concentrated in the well-demarcated red-light area of Baina. It was replaced by a heterogeneous sex trade, without demarcated borders and dispersed throughout Goa. Although the accounts portray the demolition as a catastrophic force that “dispersed” and “scattered” the sex workers throughout Goa, they also contain descriptions of the embryonic forms of the new sex work that emerged from the dust of the demolition.

The sex work that emerged seemed to be an expansion of existing smaller pockets of sex work outside of Baina, as well as the introduction of new modes of operation

common in neighbouring Karnataka. The post-demolition sex work in Goa attracted both Baina women who either relocated or continued to work from their homes in the Baina slum, as well as newer recruits into the sex trade from outside Baina. The female brothel owners of Baina gave way to a new cadre of male and female pimps who facilitated the sex trade. Part-time and informal sex workers such as construction workers and family women replaced full-time and easily recognisable sex workers.

New modes of operation

Post-demolition there was dramatic reductions in brothel-based sex-work. Of the 57 gharwalis identified before the demolition only a handful continued to operate in Goa after the demolition. The vacuum left by the departure of the brothel-owners was filled by Goan pimps who brought short-term contract girls to work in the lucrative tourist belt, and lodge-owners who became more proactive in organising “dates”. Independent FSWs became more reliant on “agents”, “pimps” and “motorcycle-taxis”, to arrange rendezvous with customers.

Encroachment

Baina sex workers started to encroach into other sex-work haunts. The best described of these was the movement of ‘Baina women’ into the small-scale street-based sex work of Goa’s large commercial hub, Margao city. The arrival of the large numbers of ex-Baina women not only led to “territorial fights” and “increased police vigilance”, but also impacted upon the organisation of sex work in these areas. The more experienced and professional sex workers of Baina contacted the lodge-owners and displaced the pre-existing FSWs who worked there,

“...Now I find it difficult to earn even one hundred rupees...because the market is flooded with Vasco (Baina) girls...they tell me that they are not allowed to do this business in Vasco. Their huts have been demolished. (IDI non-Baina-SW)

New entrants

The demise of Baina red-light area encouraged new women in the vicinity to enter the trade. These new entrants were described as less professional sex workers, i.e. more likely to be part-time, working from home, through mobile phones, or, on the street.

“No, these girls are not ex-Baina-SWs. They used to come to Mangor before Baina demolition also. But in those days nobody was interested in them. Because, even though they were young, they looked ugly, their clothes were dirty, and they smelt bad.... But after the Baina demolition the situation changed; the same dirty, smelly, rag-pickers have become like gold” (KII local expert)

Heterogeneous dispersed sex work

The resultant sex work included street-based FSWs that solicited in the railway stations, bus stops and municipal parks of the larger urban settings; FSWs women working 10-14 day contracts in a range of lodges scattered throughout Goa; independent FSWs working from their homes and through mobile phones; FSWs on short term contracts to pimps and confined to flats in the coastal tourist belt; construction workers and slum women who subsidised their meagre income with transactional sex; and the survivors of the Baina demolition who continued to work from the neighbouring slum.

Attitude to demolition

The media and public opinion was largely supportive of the demolition. The local Catholic Church even organised a large demonstration in support of the demolition. Key informants who lived and worked in close proximity to sex workers on the other hand were more conflicted about the merits of the demolition. However, their main concern was the impact on men and their wives and daughters; there was little concern or empathy for the fate of the FSWs.

A common theme was that sex work is a necessary evil to protect innocent women from men's uncontrollable sexual urges. The majority of key informants were sure that sex work would "spread" and delivery of HIV prevention would become more difficult. These "unregulated" and dispersed FSWs would thus become the source of contagion. A smaller minority echoed the public perception that Baina was the source of the contagion and thus demolishing it would halt the spread of HIV.

The risk environment

Reduced negotiating power

Unfamiliar territory, increased secrecy, and greater reliance on pimps and mediators for customers, weakened the women's negotiating position. They had much less control over the number of clients, or what the clients expected on "dates" organised by pimps. The following scenario was fairly typical,

"Three guys from Bombay had booked her for a night but the pilot had taken money for one full night plus a full day... When the girl wanted to leave the clients refused to let her go and locked her up inside the lodge." (FN)

"Without money to eat, health was the lowest priority". Women were forced to take risks in order to provide food and security for themselves and their dependents. One of the private doctors, popular with FSWs, suggested that this need for money and the lack of negotiating power was leading to reduced condom use and that he was seeing more symptomatic STIs in women returning from their dates.

Loss of community support

FSWs described the close-knit community in Baina as being one they relied on to protect them against customer violence. They also found that the gharwalis' insistence on condom use helped them to enforce it,

"In Baina... one man [customer] caught me by the dress, pulled me and asked me why I did not come? So the bar boys working there chastised him... 'If the girl doesn't want to come that is her business... why are you raising your hand to this girl?'"
(IDI ex-Baina-SW)

The forced destruction of the Baina community, also, destroyed the informal social safety nets that women had depended on in the past, as this ex-Baina-SW describes,

"Earlier, if we did not have enough money, someone would give us 10-20 rupees [with which] we could run our domestic life.... But now, even if you ask, there is no one who can give you a single rupee"

Police raids

In the aftermath of the demolition the concern that Baina-type sex work would spread throughout Goa led to increased police vigilance throughout Goa. Shopkeepers in the market place were requested to prevent women from soliciting and there were weekly raids on the lodges. The increased vulnerability to police raids translated into fines and bribes, which in the context of reduced custom and increased poverty, meant taking greater risks to pay back the debt. This is illustrated in the following case study,

An ex-Baina-SW went on a “date” to an unfamiliar lodge in Northern Karnataka. Partly due to her unfamiliarity she was involved in a police raid and had to pay a large fine. Her gharwali, her intimate partner and moneylenders were reluctant to lend her money that she was unlikely to be able to pay back. Unable to raise the funds and rejected by the intimate partner that she had provided for during more affluent times, she took rat poison and killed herself.

Access to HIV prevention

Post-demolition three of the four NGOs working towards HIV prevention in Baina abruptly ceased their activities amongst FSWs. Service utilisation was further constrained by FSWs ambivalence towards NGOs. Women were “tired of the HIV message”. They were angry at the negative publicity anti-trafficking and HIV prevention brought. They blamed the NGOs for “driving the clients away” and even blamed them for the police presence. Ultimately, they resented having embraced HIV prevention, only to be made a scapegoat by politicians for the HIV epidemic anyway,

“He [senior politician visiting red-light area] blamed Baina for the HIV epidemic in Goa and giving HIV to the Goan boys. ... He said that HIV/AIDS is spreading and people are suffering because of this red-light area, hence it is better to close it” (FN-interview, Gharwali)

Access to health-care

During one week of the police cordon one FSW committed suicide, another died of a septic abortion in the local hospital, and two died of acute febrile illnesses, preferring to risk a 48 hour train journey to their home-town, rather than avail themselves of public health services in Goa. This comment by a FSW during group discussions tries to make sense of the tragedy,

“... We are dropping dead like flies... we have no money to go to private doctors. Because we are from Baina we would have to spend 10,000 – 20,000Rs [\$200-\$400] each time we get sick We do not have that money and the gharwalis and moneylenders are also afraid to lend us money.... So we have to go to government service and no one wants to go because there they test us for HIV and we will die anyway”.

CONCLUSIONS

Interventions targeting FSWs are the key to controlling India’s epidemic. Despite India’s pioneering work on the effect of collective action on HIV prevention in FSWs (Jana et al., 1998; Halli et al., 2006) the policy environment of India continues to permit events such as the Baina demolition. We believe ours is the first detailed

account of the effect of dismantling a red-light area on the reorganisation of sex work and FSWs' sexual risk. The results showed that sex work was adaptive to changing circumstances and a concentrated and homogeneous sex trade rapidly evolved into a heterogeneous and dispersed form. However, the social context of sex work that emerged from the dust of the demolition was higher risk and less conducive to HIV prevention.

The entire process of the eviction created a higher risk environment for sex work. In the short term, fear, insecurity and economic need de-prioritised health and in particular sexual health for FSWs. Economic necessity and unfamiliar territory weakened their negotiating position. Populist rhetoric espoused by media and politicians, portraying the demolition as a means to rid Goa of evil, crime and HIV, eroded the FSWs trust and confidence in HIV prevention services. In the longer term, sex work became dispersed and fragmented, mobile and clandestine and consequently harder to reach by the disrupted services.

There is a growing evidence implicating structural factors at the social and community level in vulnerability to HIV (Parker, Easton, & Klein, 2000; Shahmanesh, Patel, Mabey, & Cowan, 2008). Our survey of FSWs in Goa suggested that structural factors mediated through gender disadvantage were particularly associated with higher sexual risk and STIs (Shahmanesh et al., 2008). A controlled trial of structural interventions in FSWs conducted in the Dominican Republic suggested that the policy milieu may be instrumental in encouraging community mobilisation to become an effective reality (Kerrigan et al., 2006). Using the same analogy the Baina demolition was a negative structural intervention, a catastrophic event that fragmented FSWs collective identity and agency. The process of the demolition disengaged women and made them feel powerless. The women were rendered voiceless; with decisions regarding their lives being made in fora to which they had no access, using languages (English, Konkani, and written) with which they could not engage. They felt they were made a scapegoat for the HIV epidemic in spite of their engagement with the governments HIV prevention programme. Their forced dispersion and heightened animosity jeopardised the very collective identity (Cornish et al., 2007; Campbell, 2000), which has been associated with the successes in reducing HIV in West Bengal and Tamil Nadu (Chandrasekaran et al., 2006) and successfully increased coverage of sex workers in Karnataka (Steen et al., 2006; Halli et al., 2006). The violence of the demolition became the overriding violence in their lives, and all other violations, including HIV, became inconsequential (Downe, 1997).

There has been much attention paid to the role of stigma and its impact on self-esteem and agency in marginalised populations (Campbell, 2000; Cornish et al., 2007). There are suggestions from studies in Northern Karnataka, and our unpublished data, that traditional sex workers, whose transactional sex has a degree of social sanction, seem to experience less stigma and violence from the community (O'Neil et al., 2004; Blanchard et al., 2005). The vocal animosity of the media, the church, politicians and neighbouring communities preceding the demolition heightened the stigma and otherness the women felt. The police harassment and systematic hounding-out of Baina sex workers that continued following the demolition compounded the marginalisation and outsider-ness. Baina sex workers were forced to take on alternate identities, for example to don the traditional attire of the family woman-the sari.

Yet, the women continued to adapt to this increasingly hostile and high-risk environment. This flexibility shows a degree of agency that a purely structural analysis of the post-demolition risk environment would not explain (Cornish et al., 2007; Asthana et al., 1996). In keeping with other work that suggests the creative force that agency brings (Campbell, 2000; Hershatter, 1992; Walkowitz, 1980), our study describes a more dynamic relationship between the sex worker and her environment. Despite the hazardous conditions, the women actively engaged with the research process; the community advisory board met regularly; women participated in the survey and dissemination process, sharing their ideas about the shape they felt the intervention should take.

The way forward: An ambiguous approach to the rights of FSWs only worsens the stigma and exclusion that they experience. Policy and legislation that either criminalises nearly 1% of the India's adult female population or renders them invisible victims without agency further marginalises and disempowers this group. Instead, we need to support legislative or policy changes that support sex workers agency and creates a safer risk environment within which sex work occurs; an environment that encourages FSWs to organise and collectively bargain for the terms and conditions within which they choose or choose not to work.

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A study comparing sexually transmitted infections and HIV amongst redlight area and dispersed female sex workers following the demolition of a redlight area:

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Abstract

Objectives: In June 2004 the red-light area of Goa, was demolished. We compare HIV and sexually transmitted infections (STIs) between sex-workers who had been based in Baina red-light area (Baina-SWs) with sex-workers that had never worked in Baina (non-Baina-SWs).

Methods: 326 sex-workers recruited using respondent-driven-sampling, completed interviewer-administered questionnaires, and were tested for *Trichomonas vaginalis*, *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and antibodies to Herpes simplex type 2, and HIV. The association between ever working in Baina red-light area and HIV and STIs was examined using multivariate analysis.

Results: Non-Baina-SWs made up 55.3% (n=201) of the sample, 48% of whom had entered sex-work since the demolition. Non-Baina-SWs more likely to be Goan, have experienced sexual and intimate partner violence, to work part-time, from home or the streets, and to have fewer clients. Baina-SWs were less likely to have curable STIs adjusted Odds Ratio (adjOR) of 0.27(95%CI;0.10-0.73) and were more likely to have been exposed to HIV prevention and report consistent condom use with clients.

Conclusion: Non-Baina-SWs were more likely to be engaged in high-risk sexual activity. Although partly explained by lack of exposure to HIV prevention and inconsistent condom-use; social and professional isolation and greater experience of intimate partner and sexual violence may play a role.

Keywords: HIV infection; prostitution; developing countries; India; sexually transmitted infections; female; public health.

INTRODUCTION

The HIV epidemic in India, the world's second most populous country, is of global importance(1). Targeting core groups is a critical component of the national HIV prevention strategy(2). Female sex-workers (FSWs) are a large core group, with National AIDS Control Organisation estimating that up to 0.7% of India's adult female urban population are engaged in transactional sex(1). Yet, with the exception of exemplary programs in South India's high prevalence States, HIV prevention in FSWs is suboptimal(1).

Despite mounting evidence for targeting FSWs as part of a comprehensive HIV prevention strategy(3-5), only ten countries provide HIV prevention services to the majority of their FSW(6). This failure reflects the tension between two opposing HIV prevention philosophies: harm reduction versus prohibition. Policy makers and the public often prefer the "quick fix" allure of the latter. Moreover, public health interventions targeting disenfranchised groups such as FSWs inadvertently create scapegoats for prohibitionists to pursue.

Baina beach, a well-demarcated slum of 0.09 km², situated in Goa's largest port, was a renowned red-light area. Having emerged in response to docking ships, it expanded and adapted to the needs of tourism, and its army of migrant workers. HIV prevention interventions, consisting of behavioural change, condom promotion and improved STI care, had been provided for the 2000-3000 FSWs living and working in Baina red-light area since the early 1990s. Routine surveillance recorded a pre-demolition HIV prevalence of 30-50% in Baina SWs and high levels of HIV awareness and condom use(7).

The Immoral Trafficking Prevention Act (ITPA) regulates sex work in India. Whilst the act does not prohibit prostitution per se, prostitution carried out in a brothel or within 200 metres of certain public places, is a criminal offence. On the 14th of June 2004, the Government of Goa implemented part of a Mumbai High Court ruling and demolished Baina red-light area(8). No rehabilitation or relief was provided for the Baina community and a decade of HIV prevention was brought to an abrupt close(8). Since the demolition of Baina several high profile closures of red-light areas and dance bars have taken place in India. Moreover, the Lok Sabha (the Indian parliament) is discussing amendments to ITPA, which will penalise the purchase of sexual services, i.e. criminalise clients(9). There is an urgent need to systematically document the public health consequences of such prohibitive approaches that force sex workers into more clandestine and invisible types of transactional sex. We hypothesised that following the demolition area-based sex work would be replaced by more dispersed and clandestine types of sex work, less amenable to HIV prevention. In this cross sectional study of FSWs, conducted in the year following the demolition; we compare the sex work concentrated in Baina with the dispersed sex work that materialized.

METHODS

Study setting: The study was set in Goa, a small coastal state with a population of 1.37 million(10). Following the demolition the relatively homogeneous population of

Baina based FSWs rapidly evolved into a more heterogeneous dispersed and clandestine group(11). This study was conducted throughout Goa in collaboration with Positive People, the largest and most experienced HIV organisation in Goa. Recruitment took place from December 2004 - December 2005.

Study population: FSWs were defined as women who provide sexual services in exchange for goods or money.

Sampling method: The FSWs in the survey were recruited using respondent-driven sampling (RDS)(12). This variant of chain-sampling delves deeper into the hidden networks by rationing the number of recruits per respondent, increasing the number of waves of recruitment, and providing financial incentives to the “recruiter”. The initial recruiters (seeds) were defined as FSWs or community members close to sex work. Based on detailed ethnographic mapping of Goa, seeds were purposively selected from various ethnicities, ages, areas of Goa, and sex-work typologies(13).

Data collection and Management: This has previously been described in detail(13). Data were collected through face-to-face interviews with a female interviewer in one of four Indian languages. Women were asked to provide self-taken vaginal swabs and dried-blood-spots. These specimens were tested using the Roche Amplicor PCR assay for chlamydial and gonococcal infection, culture (In-pouch) for *Trichomonas vaginalis*, WHO testing algorithm for HIV, and Enzyme Linked Immune Absorbent Assays for Herpes Simplex Virus 2 antibodies (Focus Technologies).

Statistical analysis: In order to adjust for potential biases in recruitment, data were weighted by the inverse of the approximate probabilities of recruitment(12). The weights were calculated, based on network size, age, ethnicity and area, according to how these factors were related to recruitment, using RDS Analysis Tool 5.4.0 (Cornell University, USA). Analyses were performed using Stata8 (Stata Corporation, Texas, USA), incorporating the weights through the survey analysis functions. The exposure was defined as ever having worked in Baina red-light area. Characteristics of FSWs who had ever worked in Baina (Baina-SWs) were compared with FSWs who had never worked in Baina (non-Baina-SWs). The association between the exposure, i.e. being a Baina-SW and the following outcomes, bacterial sexually transmitted infection (STI), HIV, self-reported condom use, and ever having attended HIV prevention sessions, were measured using multivariate analysis and adjusting for potential confounding factors. Confounders were defined for each outcome as factors associated with both exposure and outcome ($p < 0.2$) and not on the explanatory pathway. Age, religion, ethnicity, marital status, socioeconomic status, number of regular and non-regular paying customers, and duration of sex-work were included as a priori confounders based on published literature. Finally factors potentially on the explanatory pathway were added into the model to explore their effect on the relationship between bacterial STIs and having worked in Baina

Ethical considerations: Ethical approval was obtained from the Independent Ethics Commission, Mumbai and University College London’s ethics committee. A community advisory board mediated community engagement. We campaigned against the demolition and provided material support in the immediate aftermath. All participants and their partners were offered presumptive treatment for bacterial STIs as well as treatment based on laboratory tests. HIV results were anonymous, however

voluntary counselling and testing for HIV, treatment for STIs, and HIV risk reduction counselling was made available to participants and non-participants alike.

RESULTS

326 sex-workers were recruited from 35 of the 59 seeds approached. Following up to six recruitment waves, each seed gave rise to between two and thirty participants. Based on our extensive mapping we became aware of FSW networks that we were unable to recruit; these comprised mainly of women who did not self identify as FSWs. All areas of Goa and types of sex work identified through mapping were represented in the sample.

Of the 326 FSWs recruited 125 [44.8%(95%CI;39.1-50.5) had ever worked in Baina and 201 [55.3%(95%CI;49.5-60.9)] had never worked in Baina. 96 [47.9%(95%CI;40.9-55.0) of the non-Baina-SWs had started sex work since the demolition.

Table 1 summarises the differences between Baina and non-Baina-SWs. The non-Baina-SWs were more likely to be Goan, part-time, street and home-based FSWs. They were more likely to work in more than one place and entertained fewer customers, more of whom were regular clients. They were more likely to experience gender-based violence and report suicide attempts, but less likely to be economically disadvantaged than their Baina counterparts.

After adjustment for confounding (table 2) compared to non-Baina-SWs, Baina-SWs had three times lower odds of having a curable STIs, twenty times greater odds of exposure to HIV prevention and a hundred times greater odds of reporting consistent condoms use with clients. The greater odds of HIV in univariate analysis did not remain statistically significant after adjustment.

Following further adjustment for behavioural factors potentially on the explanatory pathway i.e. condom use with paying and non-paying male partners, HIV knowledge, and exposure to HIV prevention interventions, Baina-SWs were still less likely to have bacterial STIs; adjOR 0.30 (95%CI;0.19-0.94).

Table 1: Characteristics associated with FSWs who have ever worked in Goa's red-light area, Baina, compared to FSWs who never worked in the Baina red-light area

Variable	Non Baina -SW (N=201) N [weighted %(95% CI)]	Baina -SW (N=125) N [weighted%(95% CI)]	P value
Age over 25	117 [60.5 (53.3-67.2)]	74 [64.6 (55.9-72.5)]	0.5
Ethnicity non-Goan	150 [81.1 (75.6-85.6)]	122 [98.3 (94.9 – 99.5)]	<0.001
Religion:			0.005
Hindu	122 [63.2 (56.1-69.7)]	101 [84.5 (77.5-89.5)]	
Christian	30 [12.6 (8.8-17.7)]	11 [7.0 (3.8-12.3)]	
Muslim	47 [24.2 (18.6-31.0)]	13 [8.6 (5.0-14.5)]	

Not fully literate	150 [78.8 (72.7-83.8)]	105 [85.8 (78.7-90.8)]	0.1
Marital status			<0.001
Married	108 [58.5 (51.4-65.2)]	26 [17.6 (12.1-25.0)]	
Widowed / separated	56 [27.4 (21.5-34.1)]	45 [36.6 (28.4-45.7)]	
Never married	37 [14.1 (10.2-19.3)]	54 [45.8 (36.9-54.8)]	
Migrated to Goa	131 [69.8 (63.2 – 75.6)]	103 [82.0 (73.9-88.0)]	0.02
Support dependents	67 [84.8 (79.2 -89.1)]	116 [93.6 (87.9-96.7)]	0.02
Debt	90 [46.4 (39.4-53.6)]	80 [65.0 (56.1-73.0)]	0.002
Entrapment (Not free to leave SW)	18 [8.7 (5.5-13.6)]	11 [9.9 (5.5-17.1)]	0.7
Autonomy (In use of money)	150 [74.9 (68.2-80.6)]	70 [53.1 (44.1-62)]	<0.001
Political empowerment	91 [45.6 (38.7-52.8)]	79 [66.8 (58.1-74.5)]	<0.001
Violent regular male partner	97 [45.6 (40.5-54.7)]	27 [19.5 (13.5-27.4)]	<0.001
Lifetime sexual violence	31 [13.3 (9.4-18.7)]	5 [3.4 (1.4-8.2)]	0.004
Police raid in past year	32 [14.4 (10.2-19.9)]	18 [13.5 (8.5-20.8)]	0.8
No emotional support past week	138 [69.6 (62.7-75.7)]	59 [47.4 (38.5-56.4)]	0.001
Suicidal attempt (Past 3months)	59 [25.5 (20.0-32.0)]	14 [10.3 (6.1-16.9)]	<0.001
Duration SW			<0.001
Less than one year	96 [47.9 (40.9-55.0)]	9 [6.8 (3.5-12.8)]	
One to ten years	86 [42.2 (35.4-49.4)]	59 [42.9 (34.4 – 51.9)]	
More than ten years	19 [9.9 (6.3-15.1)]	57 [50.2 (41.3-59.2)]	
Other source of income	107 [57.0 (49.8-63.8)]	33 [27.9 (20.5-36.7)]	<0.001
Street workers	72 [28.5 (31.7-45.7)]	5 [3.2 (1.3-7.7)]	<0.001

Work from home	69 [36.4 (29.7-43.5)]	20 [17.7 (11.7-25.9)]	<0.001
Work in bar brothel or lodge	88 [38.7 (32.1-45.6)]	104 [81.3 (73.0-87.5)]	<0.001
Start sex-work under the age of 16	23 [9.8 (6.4-14.8)]	41 [34.0 (26.0-43.1)]	<0.001
At least one client per day	114 [55.1 (47.9-62.1)]	94 [71.9 (62.9-79.5)]	0.004
At least one regular customer	102 [50.1 (43.0-57.2)]	38 [28.1 (20.8-36.7)]	<0.001
Work in more than one place	10 [70.3 (61.3-78.0)]	34 [29.7 (22.0-38.8)]	<0.001

Table 2: HIV, STIs and sexual behaviour outcomes independently associated with FSWs who have ever worked in Goa's red-light area Baina compared to those who never worked in Baina.

Variable	Non-Baina – SW Weighted% (95% CI)	Baina-SW Weighted % (95% CI)	Odds Ratio (95% CI)	P Value	Adjusted OR ⁵¹ (95% CI)	P Value
HIV	16.9 (12.1-23.1)	36.6 (28.4-45.4)	2.83 (1.65-4.86)	<0.001	1.95 (0.85-4.56)	0.1
STI presence (Chlamydia, gonorrhoea or trichomonas)	26.3 (20.4-31.2)	13.3 (8.2-20.9)	0.43 (0.23-0.94)	0.03	0.27 (0.10-0.73)	0.01
Trichomonas	14.1 (9.8-19.8)	2.5 (0.8-7.6)	0.16 (0.04-0.57)	0.004	0.33 (0.13-0.87)	0.03
Always use condoms with clients	54.1 (46.9-61.1)	99.2 (94.8-99.9)	110.9 (15-818.8)	<0.001	10552 (7-1497)	0.001
Ever having an HIV session from an NGO	10.0 (9.6-15.1)	74.1 (65.7-81)	13.3 (6.1-29.2)	<0.001	21.2 (7.3-60.9)	<0.001

⁵¹ After adjusting for age, ethnicity, religion, marital status travel in the past year, duration in sex work, number of regular and non regular customers, having a regular non-paying male sexual partner, socioeconomic indicators (debt, homeownership and number of dependents) and measures of autonomy (in use of money, political empowerment and entrapment).

⁵² In addition to above factors adjusted for alcohol use

DISCUSSION

We believe this is the first description of sex work in the immediate aftermath of dismantling a red-light area. Our study suggests that the homogeneous red-light area based FSWs were at lower risk of bacterial STIs than the heterogeneous dispersed FSWs that materialised after the demolition.

Part-time, dispersed, home and street-based FSWs filled the void left by the demolition. The non-Baina-SWs were more likely to have bacterial STIs, a biological marker of recent sexual risk. This finding was in keeping with their lower likelihood of reporting consistent condom-use with clients(14) and supports the hypothesis that the non-Baina-SWs were more likely to engage in high-risk behaviour. Although this may partly be explained by lack of exposure to HIV prevention interventions, the persistence of higher odds of bacterial STIs even after adjusting for behavioural and knowledge indicators, suggests that more proximal determinants, such as their greater experience of sexual and intimate partner violence and their social isolation and lack of collective identity may also play a part(15).

Baina-SWs were more likely to have HIV, although this difference was not statistically significant after adjustment for confounding. Baina-SWs reported a longer duration in sex work and greater number of clients, and were more likely to have migrated from the higher prevalence areas of Northern Karnataka, which is an independent risk factor for HIV(13).

We have compared Baina with non-Baina-SWs. The speed with which events unfolded meant that quantitative pre-demolition data were unavailable for comparison. As recruitment started soon after the demolition, it was likely that the Baina-SWs would approximate to the FSWs working in Baina prior to the demolition whilst the non-Baina-SWs would represent the types of dispersed sex work that dominate the sex trade following the demolition. It remains possible, however, that the Baina-SWs who continued to practice in Goa are different to those who left.

A dedicated team, familiar with sex work, conducted this study. We actively engaged in advocacy. Our community advisory board sought refuge in our community centre, and we provided material support post-demolition. This lack of “distance” may have resulted in interviewer bias. Similarly, our association with HIV prevention may have resulted in social desirability bias. Nevertheless, the fact that we could collect this rich data is testimony to these relationships. Furthermore, behavioural data collected through the survey was consistent with data collected through qualitative methods, informal confidential voting interview, and biological markers(13).

In order to reduce selection bias we used chain sampling where the probability of recruitment can be calculated, however this is not a probability sample survey. Whilst we are able to incorporate variability in the probability of recruitment through weighting to provide unbiased analysis, one limitation is that the full complexity of the RDS sample is not reflected in the standard errors, and so the confidence intervals and p-values should be viewed as approximate.

Despite these limitations, the increased risk of STIs among dispersed sex workers, which is likely due to the to disruption of HIV prevention services, is of a similar

magnitude to the reductions recorded in successful sex-work interventions (5;16-18). Similarly, successes of interventions to reduce structural vulnerability to HIV, e.g. Thai 100% condom use and Sonagachi empowerment model (19-21), support our finding that less organised FSWs working in divided and clandestine conditions would likely be more vulnerable.

In conclusion, HIV prevention and the human rights of sex workers must be integral to legislation and policies governing sex work.

Summary

- Dispersed non-brothel-based sex workers were more likely to be engaged in higher risk sexual activity
- This is partly explained by difference in consistent condom use and exposure to HIV prevention intervention
- Social isolation, lack of collective identity and experience of intimate partner and sexual violence may play a part

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12.2 Questionnaire

This was originally designed in EXEL and exported to Coral for printing. The printed version was for larger page size. On adaptation for this appendix it has been refitted to a smaller page size and thus although the content is correct, visually the questionnaire looked different

Subject Identification

subject ID Number

--	--	--	--

Interviewer ID number

--	--	--

Site

--	--	--

Place of interview

--	--	--

Participant seed No. (if seed)

--	--	--

Participant referred by (ID number of referring participant or seed)

--	--	--

Relationship with person referred by

--	--	--

Date

		2004/:
--	--	--------

Time

--	--	--

Duration of interview

--	--	--

Checked by 1

--	--	--

Checked by 2

--	--	--

Data entered by

--	--	--

Data entry date

		2004/:
--	--	--------

Informed Consent checklist

Informed consent given

Y=1, N=2	
----------	--

Participant took a copy of her own informed consent

Y=1, N=2	
----------	--

Informed consent witnessed by another person

Y=1, N=2	
----------	--

Link log form filled

Y=1, N=2	
----------	--

RDS referral coupons given

Y=1, N=2		
----------	--	--

If yes number of the reference vouchers

--	--	--

Specimen collection

Sample	Collector ID	Date	Time		
TV InPouch					
Vaginal swab for CT/NG					
Dry Blood spot					
Syphicheck					
Whole blood for RPR					
Urine for pregnancy test					
Other					

Treatment Given

Pack A

Y=1, N=2	
----------	--

Pack B

Y=1, N=2	
----------	--

Pack C

Y=1, N=2	
----------	--

Pack D

Y=1, N=2	
----------	--

Other/ Specify

Participant referred to other agency

Y=1, N=2	
----------	--

Reason for referral

--	--

Specify agency referred

--	--

Signature

sec 1 Demographics

Subject ID

No.	Question and filters	coding catagories	code
101	What Language do you prefer to speak? (Aap kis bhasa mein baat karna pasand karangi?) (Neevu yava basheyalli mathanaduthiri)? MEERU YE BHASALO MHATLADADANIKI ISHTAPADTARU? Tumi khoince bhaxen ulounk sodtele?	Hindi 1 Telegu 2 Kannada 3 Marathi 4 Konkani 5 Lamani 6 Bengali 7 Other/Specify 12	
102	How old are you? Aap ki umar kya hai? (Nimma vayassu yestu)? MEE VAYASSU YENTA ? Tumkam vorsam kitlim?	Age <i>Code 0 if they do not know age</i>	
103	Interviewer's estimate of age	< /=20 1 21-25 2 26-30 3 31-35 4 36-40 5 >40 6	
104	Where are you from/ what is your ethnicity? (Aap konsi jagah se hai?) (Nimma ooru yavudu)? MEERU YE PRANTANIKI SAMBHANDINCHINA VARU? Tumi Khoinchim?	Andra Pradesh 1 Karnataka 2 Goa 3 Maharashta 4 West Bengal 5 Tamil Nadu 6 Gujurat 7 Kerala 8 Other/Specify 12	
105	What is your religion? (Aap kis dharma ki hai?)	Hindu 1 Christian 2	

	<p>(Nimma dharma yavudu)? MEE MATHAM YEMITI ? Tumi khoichea dhormache?</p>	<p>Muslim 3 Other/specify 12</p>	
106	<p>How many years of school have you completed (i.e. passed)? (Aap kitne saal patshaala padhi hai (pass huie hai?) (Neevu yestu vodidira)? MEERU BADILO ENNI SAMVASTARALU CHADIVARU? Tumi kitle dekhun xikleat?</p>	<p>Number</p>	
107	<p>Literacy (in any language) (Saksharta: kisi bhi bhasha mein) (Saksharathe yestu) (Vidhya Jnana)? AKSHARASYATA[YE BHASHALO AINA Tumkam boroupak/vachpak gomta?</p>	<p>Read & Write 1 Only Read 2 Neither Read or Write 3</p>	

Sec 2 Migration				
subject ID				
No.	Question and filter	Coding Category	Code	
201	Where were you born? (Aap ka janam kaha hoa tha?) (Neevu huttida stala yavudu)? MEEREKKADA PUTTARU? Tumi khoi zolmole?	Andra Pradesh 1 Karnatake 2 Goa-Baina 3 Goa 4 Maharashta 5 West Bengal 6 Other/Specify 12		
202	How long have you stayed in Goa this time? Es baar Aap kitne samay se Goa mein rah rahi ho? (Neevu goa dalli nele nintu yestu varusha vayitu)? MEERU EESAARI GOVALO ENTAKALANGA UNTUNNARU He pautt Tumi kitlim vorsam Goent ravleant?	Years or months If since birth 98 if less than one year 00 if less than one month 00		If 98 skip to 205
203	Is this the first time that you have arrived in Goa? (Kya yeh pehli baar hai ki aap Goa aaie hai?) (Ide modala barige neevu goa kke bandadda)? MEERU GOVAKU RAVADAM IDE MODATISARAA? (hi tumchi poilich pautt, tumi Goeant ailear?)	Yes 1 No 2 not applicable 13		If yes go to 205
204	If no, how long ago was the first time? Agar nahin, tho pehli baar aap kab aiye thi? (Onduvele Allavadare neevu modala barige yavaga bandaddu)? IDI MODATISAARI KAAKA POTE EPPUDU MEERU MODATISAARIGAA GOVAAKU VACHCHAARU? Nam zalear, poile pautt tumi kitle dis vell dekhun ravlim?			
205	In the last year have you travelled outside of Goa? (Pichale saal mein kya aap Goa ke bahar gayi thi?)	Yes 1 No 2		Go to section

			3	
	<p>(Hoda varushadalli neevu goa dinda horage hogiddira)?</p> <p>GATA SAMVASTARAMLO MEERU GOVA BAYATA PRAYANAM CHESARAA]</p> <p>(Gellea vorsant tumi Goeam bhair bhovndi/provas kela?</p>			
206	<p>Now I want you to list all the places that you have visited in past year outside Goa. For place I will ask you how long you spent there? Did you get paid for sex there? If you were engaged in sex work did you experience a police raid/ arrest?</p> <p>(Ab mein aap pichale ek saal mein goa ke bahar jin-jin jagaho par gayi thi unn jagaho l mein likhugi. Har jagah par aap ne kitna samay bitaya? Aap ko vaha par apne kaam ke paisa mila kya? Kya vaha par police ki raid padi thi/ ya aap ko police</p> <p>(Neveu ho da varusha dalli betimadda stalagalunnu nenapumaddi kolli. Prathi stl neveu yestu kala nele nenthididira. Alli nimage dhanda vrathige yestu hanakodut Alli police sara nimanu hidididara).</p> <p>MEERU GATA SAMVATSARAMLO GOVAA BAYATA VELLINA ANNI STALAALANU CHEPPAMANI NENU IPPUDU MIMMALNI ADUGUCHUNNAANU AKKADA LAINGIKAPAN (DANDA) LO DABBULU DORIKAYAA?MEERU LAINGIKA PANI (DANDA) CHESTUNNATI SAMAYAMLO POLICE RAIDS GAANI PATTUKOVADAMGAANI JA</p> <p>(Atam mhaka tumi khoiche khoincea zagear Goeambhair geleat tanchim mahiti zai? Z suvater tumi ho dondo kortalim thoim policananim raid marlolo/vo tumkam policanni dhorlelim? Tumkam thoi dondo korpak (lingik sombond zoddpak poixe melltale? Dor e</p>			
		No of times	No of days	Sex work
1				
2				
3				
4				
5				
6				
7				
8				

9				
10				
207	Total number of places visited in past year	interviewer to calculate		
208	Total number of places engaged in sex work in the past year	interviewer to calculate		
209	Total time spent outside of Goa in the past year	interviewer to calculate		
210	Total number of police raids experienced in the past year	interviewer to calculate		

Section 3: Relationship Issue

Subject ID

No.	Question and filter	Coding Category	Code
301	<p>Are you married, widowed, divorced, seperated or never married? (Kya aap shaadishuda hai, vidhava hai, talakh liya hai/pati se alag rahati hai, kabhi shaadi nahin ki.) (Nivu maduveyadavara, vidaveya? Maduveu aagilva? Athava gandaninda bereyagiddira)? MEEKU PELLI AYINADAA, VIDAKULU TEESU KUNNAARA? VIDHAVA AYINAARAA, VIDIPOYAARAA LEKA PELLE CHESUKOLEDAA? Tumi kazari, tumcho ghov mela vo tumcho divorce zala vo tumi kazar zaunk nant?</p>	<p>Married 1</p> <p>Widowed 2</p> <p>Divorced/Seperated 3</p> <p>Never Married 4</p>	
302	<p>Have you ever been pregnant? (Kya aap kabhi paat se rah chuki hai?) (Nivu yavathadaru garbavatiyagidira)? MEEREPPUDAINAA GARBHAVATIGAA UNNAARAA? Tumi kedna tori gorb best zaleant?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	go to 307
303	<p>How many times have you been pregnant? (Aap kitni baar paat se rah chuki hai?) (Nivu yestu baari garbadarisiddiri)? ENNISAARLU MEERU GARBHAVATIGAA UNNAARU? Tumi kitle pavtti gorb best zaleant?</p>	number	
304	How many children have	number	

	<p>you got? (Aap ke kitne bache hai?) (Nimage yestu makkalu)? MEEKU PILLALENTAMANDI? Tumkam kitlim bhurgim asat?</p>		
305	<p>How old is your youngest child? (Aap ke sabse chote baache ki umar kya hai?) (Nimma chikka maganige yestu varsha)? MEE CHIVARI BIDDA VAYASENTA? Tumchem soglleam vonn lhan bhurgem kitlea vorsanchem asa?</p>	age	
306	<p>How old is your oldest child? (Aap ke sabse bade baache ki umar kya hai?) (Nimma dhodda maganige yestu varsha)? MEE MODATI BIDDA VAYASENTA? Tumchem sogllea vonn vhodd bhurgem kitlea vorsanchem asa?</p>	age	
<p>Now I am going to ask you some questions about your regular non paying male partner (RMP): this can be your steady boy friend, your husband, your Mard, or your Mugulu.</p> <p><i>Interviewer note: reassure the participant that this information will be treated with utmost sensitivity and confidentiality.</i></p> <p><i>Interviewer note: Insert the name/s the woman gives to her RMP (e.g. Mard, mugulu, husband, Dagad...) for the remainder of the interview</i></p> <p>(Ab mein aap ko aapke niyमित/hameesha ke saathi, jiske saath aap bina paise samband rakhti hai, uske bare mein kuch saval puchugi: woh lambe samay se aap ke saath hone wala ladka/aadmi hoga ya aap ka pati hoga ya aap ka mard hoga ya aap ka mogulu hoga).</p> <p>(Yiga nimage nanu kelavu prashne galanu keluthene aadu nimma mugulu/mard atava geleyanirabahudu atava dagad agirabahudu avara hattira neevu hana kodade sambanda ittukon diru vavaru)? DABBULU IVVAKUNDA EPPUDOO MEETO UNDE BHAAGASWAMI GURINCHI NENU IPPUDU KONNI PRASHNALU ADAGABOVU CHUNNAANU. ATANU MEE MAGA SNEHITUDU KAAVACHO LEDAA MEE BHARTA LEKA MEERU UNCHUKONNA MOGUDU KAAVACHU?</p>			

	Zea dadlea lagim tum poixe ghenastanam sombond dovorta hea vixim hanv tuka todde proxn vichrtelim. Ho zaun ieta tuzo novro, tuzo ghov, tuzo dadlo, vo tuzo mugulu.					
307	<p>Have you got a RMP? (Kya aap ka koie niyमित/hameesha ka saathi hai jiske saath aap bina paise liye samband rakthi hai?) (Nimage yaradaru (Mard) iddaraya (dagad) auaratra nevu hana kelada sambada ittiru vavaru)? ALAANTI VYAKTI (R.M.P) MEEKU UNNAARAA? Tumkam konnui dadlo sangati asa zache thaim to poixe ghenastanam sombond dovorta?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>				Go to 316
<p>Some times women may have more than one RMP: (Kabhi kabhi aurato ko ek se jayda niyमित saathi hote hai:)</p> <p>(Kelavu baari ondu hengasige ondakinta hechu (murd) dagad irabahudu)? KONNI SAARLU STREELU OKARIKANNAA EKKUVA MANDINI UNCHUKONI UNDAVACHCHU? Zaite pautt bailank eka vonn odhik dadlo sangati asta.</p>						
308	<p>How many RMP/s do you have? (Aap ka/ke aise kitne niyमित saathi hai jiske saath aap bina paise diye samband rakthi hai?) (Nimaga yestu murd iddare)? ALAA ENTAMANDINI MEERU UNCHUKONNAARU? Tumkam kitle sodanche dadle sangati asat?</p>	Number				
309	<p>Where does he (or they) live? (Woh/ Weh kaha rahte hai?) Avaru yelli vasisuthare? ATANU (LEKA VAARU) EKKADA UNTAARU? To/Te khoim ravtat? Avaru yelli vasisuthare?</p>	<p>Here in Baina 1</p> <p>Elsewhere in Goa 2</p> <p>Home State 3</p> <p>Other/Specify 12</p>	RMP 1	RMP 2	RMP 3	RMP 4

	[SEVERAL ANSWERS POSSIBLE]					
310	<p>How long have you been with him (them)? (Aap kitne samay se uske/unke saath hai?) (Neevu yestu samayadinda avanathra sambanda ittukondiddira? MEERU ATANITO (LEKA VAARITO) ENTAKAALANGAA UNTUNNAARU? Tum tache/tanche sangata kitlo temp dekhun aslim?</p> <p>[SEVERAL ANSWERS POSSIBLE]</p>	<p>Months</p> <p>Or</p> <p>Years</p> <p>If less that one month 00</p> <p>If less than one year 00</p>	RMP 1	RMP 2	RMP 3	RMP 4
311	<p>What is his/their employment? (Woh/Weh kya kaam/naukri karte hai?) (Avaru yava kelasa maduthare)? ATANU (LEKA VARRU) YE PANI CHESTAARU? To/Te koslem kam kortat?</p>	RMP 1	RMP 2			
		RMP 2	RMP 3			
		RMP 3	RMP 4			
		RMP 4	RMP 5			
312	<p>Sometimes women may find a need to change their RMP because they are not happy with him or he leaves them: How many other RMP/s` (other than the one/s that you have just told me about) have you had in the past three months? (Kabhi kabhi aurato ko apne niyमित/hamesha ke saathi/mogulu ko badalne ki zarurat paditi hai kuan ki woh uske saath kush nahin hoti hai ya unka saathi unhe chod detha hai: Es tarah abhi apne jinke bare mein bataya unke alava aap ke pichale 3 mahino mein kitne saathi rah chuke</p>	Number				

hai?)

**(Kelavu baari ondu
hengasige avara dagad
atava mard hathira
sambanda olledu yirade
bittirabahudu hage
nimage yee muru
tingalinda estu mugulu
(murd) galu Iddaru)?**

KONNISAARLU STREELU
TAAMU UCHITANGAA
UNCHUKONNA VAARINI
MARCHALSINA
AVASARAM VASTUNDI
ENDUKANTE AAMEKU
ATANI MEEDA
SANTOSHAM LEKA
POVACHCHU, LEDAA
ATANE AAMENU
VADALIVEYA VACHCHU.
GATA MOODU
NELALUGAA MEERU
ALAA UCHITANGAA
ENTAMANDINI (IPPUDU
PAINA MEERU
CHEPPINAVAARU
KAAKUNDA)
UNCHUKONNARU?
ATANU MEE MAGA
SNEHITUDAINA
KAAVACHCHU, LEDAA
BHARTA LEKA
UNCHUKONNA
MOGUDAINAA KAAVA
CHCHU.

zaite pautt bailank dista
apnnachea sodanchea
dadlea sangateak bodolpak
kiteak ti tachea sangatak
khuxal asonam vo to tika
sodda. Tuka kitle osle
dadle sangatim (Atam
tuvem mhaka sangla to
nhoi punn dusro) pattlea tin
mhoineanim asle.

313	<p>In the past one year (Pichale ek saal mein?) (Sumaru ondu varashadinada) GATA SAMVATSARA KAALANGAA? Gellea Vorsak?</p>	Number		
314	<p>Do you use condoms with your Regular Male Partner/s? (Kya aap apne niyमित/hameesha ke saathi ke saath condom ka istamal karti hai?) Neevu (Murd) dagad hattira condom upayogisuthira)? MEERU UNCHUKONNA VAARITO MEERU NIRODH UPAYOGISTAARAA? Tumi tujea sodanchea dadlea sangatea borabor condom vapurtat?</p>	<p>Always 1 Sometimes 2 Never 3</p>		
315	<p>Sometimes you may not like to use condoms with your RMP/s. Which is the main reason you do not use a condom with your RMP?.</p> <p>Interviewer let the participant answer spontaneously and enter the most appropriate code.</p>	<p>I do not want to use a condom with my RMP 1 <i>Mein apne niyमित saathi ke saath condom istamal nahin karna chahti 1</i> Nanna murd nanna hattira condom balasalu hira karisuthare 1 NENU UNCHUKONNA VAARIYO NIRODH VAADENDUKU NENU ISHTAPADANU 1 Mhojea sodanchea dadlea sangatea barabor mhaka condom vaprunk naka 1 My RMP refuses to use a condom 2 <i>Mera niyमित saathi condom istamal karne se mana karta hai 2</i> Nanna murd condom upayogisalu nirakarisuthare 2 NENU UNCHUKONNA ATANU NIRODH VAADENDUKU ANGEEKARINCHADU 2 Mhozo sodancho dadlo sangati condom ghalunk naka mhonnta 2</p>		

	<p>(Kabhi kabhi aap ko apne niyमित/hameesha ke saathi ke saath condom istamal karma aacha nahin lagata hoga. konsi mukhya vaja hai jise ke karan aap apne saathi ke saath condom istamal nahin karti hai?</p> <p>(Kelavu baari nimma murd (dagad) hattira condom upayogisade Irabahudu adakke mukya karana yenirabahudu)?</p> <p>KONNISAARLU MEERU UNCHUKONNA VAARITO MEERU NIRODH VAADENDUKU ISHTA PADAKA POVACHCHU ALAA MEERU UNCHUKONNA VAARITO NIRODH VAADAKA POVADAANIKI MUKHYA KAARANAM EMITI? Zaithe pautt tuka distelem tujea sodanchea dadlea borabor condom nam vapurpak. Khoinchea gorjechea karanak lagun tum tujea sodanchea dadlea borabor condom vapurnam.</p>	<p>I want to have a child 3 <i>Mujhe baache chahiya</i> 3 Naanage magu beku 3 NAAKU BIDDAA KAAVALI 3 Mhaka bhurgem zai dekhun 3 I am afraid of loosing my RMP if I insist on using a condom 4 <i>Mujhe daar hai ki agar mein condom istamal karne ki jid karungi tho mera niyमित saathi mujhe chod dega</i> 4 Ondu vele naanu condom balasidare nanna murd nnu kaledukolluvenemba baya 4 NENU UNCHUKONNA ATANITO NIRODH VAADITE NENU ATANINI POGOTTUKONTAANANI NAAKU BHAYAM 4 Condom usar (use) kor mhonnlear, mhazo sodancho dadlo sangati mhaka soddit mhunn bhirant dista 4 I only use condoms with customers 5 <i>Mein sirf apne customer ke saath condom istamal karti ho</i> 5 Naanu girakigala hattira mathra condom upayogisuthene 5 NENU KASTAMARALATONE NIRODH UPAYOGISTAANU 5 Hanv fokot customeram (girieakam) lagim condom vapurtam 5</p> <p>Not applicable 13</p>
316	<p>Do you use anything to prevent preganancy?</p> <p>(Aap pate se na rahane ke liya kuch istamal karti hai?)</p> <p>(Garbavanu nillisalu neevu yevnu maduthiri)?</p>	<p>Daily pill 1 <i>Garb nirodak golliyani (Mala - D)</i> 1 Mathregalu 1 ROJU BILLA/MAATRA 1 Sodanchi Guddi (pill) 1</p> <p>IUD 2 Copper T 2 IUD 2 COPPER T 2 IUD (Copper T) 2</p>

	<p>GARBHAM RAAKUNDAA AAPADAANIKI MEERU DENINAINAA UPAYOGISTAARAA?</p> <p>Tum gorv pois korpak kosle upai ghetat?</p>	<p>Abortion 3 <i>Paat saaf karana</i> 3 Garbha Tegeyuvudu 3 GARBHASRAAVAM (KADUPU TEEYUNCHUKOVADAM) 3 Ghorvpatti 3</p> <p>Injection 4 Chuchu Maddu 4 SOODI MANDU 4 Injection 4</p> <p>Condom 5 Condom 5 NIRODH 5 Condom 5</p> <p>Male sterilisation 6 <i>Adami ki nas bandi</i> 6 MAGAVAU AAPARETION 6 Dadleak kapasnni korop ani tacho bhurgem diupacho gunn nam korop 6 Female sterilisation 7 <i>Aurat ki nasbandi</i> 7 AADAVAARU AAPARETION 7 Bailek bhurgem zaupacho gunn nam korop 7</p> <p>More than one method 8 Ek se jayda tarike 8 OKATIKANNA EKKUVA PADHDHATULU 8 Eka vonn anik upai 8</p> <p>None 9 <i>Kuch nahin</i> 9 Yenuilla 9 IVEVEE KAAVU 9 Khoinchoch nhoi 9</p> <p>Other/specify 12 ITARAALU/VIVARINCHANDI 12 Anik khoincho/sang 12</p>
317	<p>If not using contraception, Why? (agar aap kuch bhi istamal nahin karti hai tho kaun?) (Onduveli neevu mele helida ugalannu balasuthillavadare yeke)? YEMI VAADATAMLEDANTE YE KAARANAM CHETA VAADADAM LEDU? Zor tor gorv pois korpache upai ghen zaleak kiteak?</p>	
318	<p>Has there been any time in the past year that you have wanted a child but been unable to have</p>	


one?		
(Kya pichale saal mein aise hoa hai ke tum baacha chahati thi magar tum pate se nahin rahe paie?)	Yes	1
(Hoda varushadalli nimage magu bekenisi prayatna madidaru magu aagada sandarbagulu iveya)?	No	2
GATA SAMVATSARAMLO EPPUDAINAA MEERU PILLALU KAAVAALANI ANUKONNAA GARBHAVATI KAALEKAPOYINA SAMDARBHALU UNNAYAA? Gellea vorsant tuka burgem zai aslem punn zaunk nam?	Not applicable	13

Sex Work (Dahnda)			
Sec. 4	Subject ID		
no	Question and filter	Coding Category	Code
401	<p>How long have you been engaged in sex work?</p> <p>Interviewer to use appropriate term e.g in the trade (Aap kab se/kitne samay se dahnda kar rahi hai?) (Neevu yestu varushadinda dhandadalli todagiddiri)? MEERU ENTA KAALANGAA LAINGIKA PANI (DHANDA) LO UNTUNNAARU? (Kitlim vorsam tumi hea lingik dondeant aslim?)</p>	<p>months</p> <p>or</p> <p>years</p>	
402	<p>Do you earn income from any other activities? (Kya aap ko kisi aur kaam se bhi paise milte hai?) (Nimage bere yavudaru bere kelasadinda hana barutada)? MEEKU VERE ITARA PANULADWARA KOODA SAMPAADANA UNDAA? Anik koslem kam korun tumkam poixe melltat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
403	<p>Have you ever worked in Baina? (Kya aap ne kabhi Baina mein kaam kiya hai?) (Neevu baina dalli kelasa madiddira)? MEERU BAINALO EPPUDAINAA PANI CHESHAARAA? Tumim Baina kednai kam kelam?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
404	<p>How many other Sex Workers do you know? (aap aur kitni dandhakarnewali aaurto ko janti hai?) (Nimage yesthu dhanda Maduva hengasaru gothiddare)? LAINGIKA PANI (DHANDA) CHESE ITARA STREELU MEEKENTAMANADI TELUSU? Anik kitlim oslea dondeant asleleank tum ollkhota?</p>	<p>Number</p>	
405	<p>Where do you work? (Type of establishmeent) Aap kahan dhanda karti hai?) (Neevu yelli kelasa (dhanda) maduthiddira)?</p>	<p>Railway Station/Street/ Park 1 Bar/ restaurant/ teashop 2 Hired Rooms/Lodgings/ Hotel 3</p>	

	MEEREKKADA PANI CHESTAARU? (ELAANTI STALAMLO) Tumi khoim kam kortat? Interviewer enter all that apply	Home/ private house 4 Brothel 5 Highways 6 Beach 7 Other/ Specify 12	
406	How do you work? (Aap kis tarah dandha karti hai?) (Neevu hege dhanda maduthiri)? MEERU ELAA PANI CHESTAARU (PANITEERU) Tumi khome bhaxen kam kortat?	Independently 1 With Garawali/ Madam/ Auntie/Keeper/ Manager 2 With Lodgings 3 Mobile phone 4 Pimp/ pilot 5 Other/ Specify 12	

If the answer to 406 is 2 or 3 continue otherwise skip to question 410. If the answer is 5 go to question 409

407	Are you on a contract? (kya aap kisi ke saath contract par hai?) (Neevu contractalli iddira)? MEERU OPPANDAM (CONTRACT) MEEDA UNNAARAA? Tumi contractacher asant?	Yes 1 No 2 do not know or refusal 14	Go to 408 Go to 409
408	What is the duration of your contract in months? (Aap ka contract kitne mahino ka hai?) (Nimma contract yestu tingalinadu)? MEE OPPANDAM (CONTRACT) ENTAKALAM (NELALLO)? Tumcho contract kitlea mhoineacho?	months	
409	What is the financial relationship with the Garawali or Lodge Owner or Pimp/Pilot? (Aap ka apne gharwaali/lodge ke malik ke saath paise ke mamle me kis tarah ka samband hai?) (Nimma lodge malikara hattira athva garwali hattira hanada vishayadalli yava tarahada sambanda ide)? DABBULA VISHAYAMLO MEE GARVALI TO GAANEE MEE LODGE OWNER TO GAANEE MEE OPPANDAM EMITI)? Tumkam ani gharwali/lodgecho patrav hanche kodde poixe vatten, koslo sombond asa?		
410	Where/ how do you generally meet your clients? (Aap kahan/kaise apne customer se milti hai?) (Nimage girakigalu yelli siguthare)?		

	SAHAJANGAA MEERU KASTAMARLANU EKKADA/ELAA KALUSUKONTAARU? Tumi khoim/koxem tumchea customerak meltat?		
411	How old were you when you first started sex work? (Jab aap ne dandha karna shuru kiya tab aap ki umar kya thi?) (Dhandavannu shuru madidaga nimage yestu vayasu)? MEERU MODATA LAINGA VYAPARAM (DHANDA) CHESINAPPUDU MEE VAYASENTA? Tumi poilo ho dondo suru kela tedna tumkam kitlim vorsam aslim?	age	
412	On average how many customers do you have on a working? ((Lagbag har roj aap ke kitne customers hote hai?) (Nimage ondu dinakke yestu customer galu baruthare)? (INCHUMINCHU OKA..... LO MEERENTAMANDI KASTAMARSTO UNTAARU? Chod-an chodd tumkam disak kitle customers (Girieak) meltat? [fill day or month as appropriate]	Day or month	
413	How many places/ different establishments have you worked in the past year? (Pichale saal mein aap ne kitni jagah kaam kiya hai?) (Hoda varushadalli neevu yestu stoalagalalli kelasa madiddira)? GATA SAMUATSARAMLO ENNI URLALO LEKA ENNI VIVIDHA STAALALO MEERU PANI CHESAARU? Gellea vorsak tumi kitlea zageancher kam kelam?		
414	List all of the different places that you have worked in the past one year (including the name of the establishment, area and State) (Pichale saal mein aap ne jitni jagah kaam kiya hai(kahan kiya hai, jagah aur kaunse rajya mein kiya ha uska naam batao). (Kaleda varushadalli neevu kelasa madida stalagalu)? (Yelli kelasa madiddira, ya rajyada hesaru heli)? GATA SAMVATSARAMLO MEERU PANI CHESINA ANNI STALAALANU VIVARINCHANDI (STALAM PERU, EE PRAANTAM, MARIYU EE RAASTRAM ANNI VIVARAALU KALISI) Gellea vorsant tumi khoincea khoincea zageanim kam kelam tancho hixop di?		

Sr.No	Name of the Place (eg-lodge, brothel etc)	Town and State	No of time: per week/Mont work there
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
415	<p>How many regular customers (fixed customer) have you got by this I mean that you have had sex with them more than once?</p> <p>(Aap ke kitne fixed customers hai (yani ki aap ne unke saath ek see jayda bar samband rakha hai?)</p> <p>(Nimage kayamina girakigalu yestu iddare)?</p> <p>MEEKU OKATIKANTE EKKUVASAARLU KALISE VYAKTULUANTE FIX KASTAMARLU ENTAMANDI UNNAARU?</p> <p>Tumkam sodanche kitle customer asat? (mhonnche jea customer-a lagim tumi eka vonn chodd pautt sombond zoddla?)</p>	number	
416	<p>Which of the following groups do you have as customers?</p> <p>Interviewer enter code for all that apply</p> <p>(Aage bataye gaye logon mein se aap ke pass kaunse customer aate hai?)</p> <p>(Yee kelage helida janaralli nimage yava tarahada girakigalu baruthare)?</p> <p>(IKKADA CHEPPINA GUMPULLO EVARU MEEKU KASTAMARSGA VASTAARU?</p> <p>Hantlea khoincea zomeantle monis tumche customer asat?</p>	<p>Tourist 1</p> <p>A worker in nearby industry or truck driver 2</p> <p>Local 3</p> <p>Police 4</p> <p>adolescent boys 5</p> <p>Don't know 6</p> <p>Other/ specify 12</p>	
417	How many customers did you have last week?		

	<p>(Pichale hafte mein aap ko kitne customer mile?) (Kaleda varadalli nimage yestu girakigalu bandiddaru)? GATA VAARAM MEEKENTAMANDI KASTAMARS VACHCHAARU? Ghelea sumanant tuka kitle customer melleat?</p>	Number	
418	<p>How many of the customers you had last week were not residents of Goa? (Pichale hafte mein jo customer tumhare pass aaye un mein se kitne Goa mein nahin rahanewale thae?) (Hoda varadalli banda girakigalalli yestu janaru goada horaginavaru)? GATAVAARAM MEEDAGGARAKU VACHCHINA KASTAMARLALO ENTAMANDI GOVA VAALLU KAARU? Ghelea sumanant tuje kitle customer Goenche nasle?</p>	Number	
419	<p>How many rupees do you charge per customer? (Aap har customer se kitna paisa laeti hai?) (Neevu obbaru girakinda yestu hana keluthiri)? OKKOKKA KASTAMARKU MEERENTA VASOOLU CHESTAARU? Tumi eklea customeracher kitle poixe gheta?</p>	Lowest Highest	
420	<p>Do you ever have sex during menses? (Kya aap ka jab mahina hota hai (badan se jata hai) tab aap samband rakti hai?) (Tingaliddu aguvaga laingika samparka maduthira)? BAHISTU AYINA SAMAYAMLO MEERU EPPUDAINAA SEXLO PAALGONNAARAA? Tumkam mhoineachem (MC) zata tedna tumi dhondo korta?</p>	Yes 1 No 2 Do not know or refusal 14	Go to 422
421	<p>Which of these methods do you use if you have customers during menses? (aagar aap jab badan se jata hai tab samband rakti hai tab aap aage bataye gaye konsi cheez ka istamal karti hai?) (Tingaliddu aguvaga sambanda maduthiradare yee kelagina yava vidanavannu balasuthiri)? BAHISTU SAMAYAMLO KASTAMARLU VASTE MEERU INDULO YE PADHDHATULU UPAYOGISTAARU?</p>	Rolled cotton balls 1 Sponge 2 Tampon 3 Nothing 4	

	Mhoineachem zata tednam customer ailear tumi kosle upai ghetat?	Other 5 Not applicable 13	
422	Have you ever used a condom? (Kya aap ne kabhi condom ka istamal kiya hai?) (Neevu condomannu balasiddira)? MEEREPPUDAINAA NIRODH UPAYOGINCHAARAA? Tumi kednam condom usar kela?	Yes 1 No 2 Do not know or refusal 14	Go to 429
423	Do you use condoms with your customers? (Kya aap apne customer ke saath condom ka istamal karti hai?) (Neevu girakigala hattira condomannu upayogisuthira)? MEEREPPUDAINAA MEE KASTAMARLATO NIRODH UPAYOGINCHAARAA? Tum customera kodem condom usar korta?	Always 1 Sometimes 2 Some customers 3 Never 4	Go to 429
424	How do you obtain condoms? Interviewer enter code for all that apply (Aap apne liye condom kahan se laati hai?) (Nimagre condomgalu yelli siguthave)? MEEKU NIRODHLU ELAA DORUKUTAAYI? Tumkam condom koxe melltat?	Customers bring them 1 Purchased from commercial outlet 2 Purchased from Garawali, Pimp, Pilot or Lodge owner 3 Free from Garawali, Pimp, pilot or Lodge owner 4 Free from NGO peers or condom outlet 5 Other/ specify 9	
425	How many condoms do you use each time you have sex? (Samband ke samay har baar aap kitne condom istamal karti hai?) (Omme laingika samparka maduvaga (neevu yestu condomgalannu upayogisuthiri)? MEERU SEXLO PALGONNA PRATI SAARI ENNI NORIDHLU UPAYOGISTAARU? Dor ek pauti customera lagim dhondo kortanam tumi kitle condom usar kortat?	Number	
426	Did you have a condom break, tear or slip in the past month?	Yes 1	

	<p>(Pichale mahine main kya aap ka condom kabhi tuta faat gaya tha, ya fisal gaya tha?)</p> <p>(Kaleda tingalalli nimma condom haridideya)/ POYINA NELALO EPPUDAINAA NIRODH PAGILI POVADAM GANI CHIRIG POVADAMGAANI LEDAA JAARIPOVADAM GAANI JARIGINDAA? Ghelea mhoineant tumcho condom kednam futla, Pinzla vo sutla?</p>	<p>No 2 Do not know or refusal 14</p>	
427	<p>Have you ever heard about the female condom? (Kya aap ne kabhi aaurto ke condom ke bare mein sunah hai?)</p> <p>(Neevu hengasina condom bagge keliddira)? AADAVARI NIRODH GURINCHI MEEREPPUDAINAA VINNAARAA? Tuvem kednai bhailanchea condomachi khobor aikolea?</p>	<p>Yes 1 No 2 not sure 3</p>	Go to 429
428	<p>Have you ever used a female condom? (Kya aap ne kabhi aaurtoka condom istamal kiya hai?)</p> <p>(Neevu yavathadaru hengasina condomnu upayogisiddira)? AADAVAARI NIRODHNU MEEREPPUDINAA UPAYOGINCHAARAA? Tuvem kednam bhailancho condom usar kela?(neevu yavathadaru hengasina condomnu upayogisiddira)?</p>	<p>Yes 1 No 2 Do not know or refusal 14 Not applicable 13</p>	
429	<p>What type of sex do you have with customers? (Aap apne customer ke saath kis tarah ka samband rakhti hai?)</p> <p>(Nimage nimma girakigala hathira yava tarahada sambanda ide)? MEE KASTAMARLATO MEERU EE VIDHAMAINA SEX CHESTAARU? Tum customera lagim khoxe bhaxen/koslem sex/kortat? Interviewer enter code for all that apply</p>	<p>Vaginal sex 1 Anal sex 2 Oral sex 3 Other/ specify 12</p>	
430	<p>How many times per day do you wash/douche your vagina? (Ek din mein aap kitni baar apne yoni ko dhoti hai?)</p> <p>(Ondu dinadalli nimma yoniyannu yestu baari toleyuthiri)</p>		

	<p>OKA ROJUKU MEERU ENNISAARLU MEE YONINI KADAGADAM LEDAA SHUBHRA PARACHADAM CHESTAARU?</p> <p>Tumi disak kitlea pauti tumche yoni bhitor dhutat?</p> <p>[If it is after each Sexual Intercourse estimate the average number of times per day based on the average number of customer they had in the past week]</p>	estimated number	
431	<p>With what do you wash/clean your vagina??</p> <p>Aap apne yoni ko kaise/kis cheez ke saath dhoti hai?</p> <p>(Neevu nimma yoniyannu yavudarinda toleyuthiri)?</p> <p>YONINI KADAGADAANI KI LEKA SHUBHARAPARACHADANI KI MEERU YEMI UPAYOGISTAARU?</p> <p>Tumchi yoni kitem gheun tumi dhutat vo nitoll/sap kortat?</p>		
432	<p>Do you use any of the following for lubrication during sexual intercourse?</p> <p>(Samband ke samay chikanaie ke liye aage bataye gayi cheezo mein se aap kya istamal karti hai?)</p> <p>(Neevu laingika samparka maduvaga yee kelagina yava vidanavannu upayogisuthiri)?</p> <p>SHAREERIKA SAMBHO GAMLO VADULUGAA UNDADAANI KI IKKADA CHEPPABADINA VETINAINAA MEERU UPAYOGISTAARA?</p> <p>Sex trasnastana ami dukoinastanam korunk tumi hantleo kosleo vostu usar kortat?</p> <p>Interviewer enter code for all that apply</p>	<p>Coconut Oil 1</p> <p>KY jelly 2</p> <p>Fair and lovely 3</p> <p>Ponds 4</p> <p>Betnovate 5</p> <p>No lubrication 6</p> <p>Condoms 7</p> <p>Other/ specify 12</p>	
	<p>Some times some of the girls may not use condoms with their customers. Which of the following are reasons you think they may not use condoms with customers. Agree or disagree or neither agree or disagree.</p> <p>(Kabhi Kabhi ladkiya apne customer ke saath condom istamal nahin karti hogi. aap ke anusar/hisabse a: batayi gayi konsi wajah ke karan woh apne customer ke saath condom istamal nahin karti hogi: en sava: ka javab ha ya na ya pata nahin mein daena).</p> <p>(Kelavu sala hengasaru girakigala hattira condumnnu balasade irabahudu Nimma prakarayee kelagina karanagalalli yavudu sariyada karanavirabahudu)?</p> <p>KONNI SAARLU KONTAMANDI AMMAYILU VAALLA KASTAMARLATO NIRODH UPAYOGINCHARU IKKADA CHEPPABADINA VAATILO YE KAARANAM VALANA VAALLU ALAA CHESTAARANI MEERANUKUN TUNNAARU OPPUKONTAANVU OPPUKONU LEDAA KAAVACHCHU KAAKA POVACHCHU, ANI JAVAABIVVANDI?</p> <p>Thodde pautti cheddvam customera lagim condom usar korneant. Tuka tim koslea karannak lagun cond usar korinant oxem distat? Hoi, na vo khobor na?</p>		

433	<p>Sometimes the customers offer us more money for sex without condoms (Kabhi kabhi customer hume bin condom ke sex karne ke liye jayda paise daete hai)</p> <p>(Condom illade samparka madalu girakigalu heccu hana kottirabahudu)?</p> <p>KONNI SAARLU NIRODH LEKUNDA SEX CHEYADAANI KASTAMARLU EKKUVA DABBU ISTAARU.</p> <p>Kedna customer amkam condom nastana sex korunk chodd poixe ditat?</p>	<p>Agree 1</p> <p>Disagree 2</p> <p>Neither agree or disagree 3</p>	
434	<p>It is difficult to find condoms when you need them (Zarurat padne par condom milna mushkil hai)</p> <p>(Bekadaga condom sikade irabahudu)?</p> <p>MEERU KAAVAALANUKONNAPPUDU NIRODH DORAKADAM KASHTAM</p> <p>Condom zai tedna mellpak kotin/avgodd</p>	<p>Agree 1</p> <p>Disagree 2</p> <p>Neither agree or disagree 3</p>	
435	<p>Some girls do not use condoms with regular (fixed) customers (Kuch ladkiya aapne fixed customer ke saath condom istamal nahin karti hai)</p> <p>(Kelavu hengasaru kayamina girakigala hattira condom upayogisade irabahudu)?</p> <p>KONTAMANDI AMMAYILU VAARIDAGGARIKI EPPUDDO VACHCHE (FIX) KASTAMARLA TO NIRODH UPAYOGINCHARU?</p> <p>Sodanchea customera borabor cheddvam condom usar korinam?</p>	<p>Agree 1</p> <p>Disagree 2</p> <p>Neither agree or disagree 3</p>	
436	<p>Some men are unable to use a condom when they are drunk (Kuch customer daru ke nashae main hone ke vagah se condom istamal nahin kar pate)</p> <p>(Kelavu gandasaru kudidu bandare condom upayogisalu kashta vagabahudu)?</p> <p>KONTAMANDI MAGAVAARU TAAGI UNNAPPUDU NIRODH VESUKOLERU?</p> <p>Thodde dadle pieun astat tenam condom usar korinant?</p>	<p>Agree 1</p> <p>Disagree 2</p> <p>Neither agree or disagree 3</p>	
437	<p>Some men force us to have sex without a condom (Kuch customer hume bina condom ke sex karne par majboor karte hai)</p>	<p>Agree 1</p> <p>Disagree 2</p>	

	<p>(Kelavaru condom illade samparka madalu othaya madabahudu)?</p> <p>KONTAMANDI MAGAVAARU NIRODH LEKUNDA SEX CHEYAMANI MAMMALNI BALAVANTAM CHESTAARU?</p> <p>Thodde daddle condom nastanam amkam Lingik sombond (sex) dovrunk forcar/boll kortat.</p>	<p>Neither agree or disagree 3</p>	
438	<p>Some girls do not know how or are too shy to put a condom on a man</p> <p>(Kuch ladkiyonko condom kaise istamal karte hai yeh malum nahin hota hia ya unhe customer ko condom dalne mein sharam aati hai)</p> <p>(Kelavu hengasarige condom balasalu gottilladirabahudu athava girakigalige condom hakalu nachike yagabahudu)?</p> <p>KONTAMANDI AMMAAYILAKU MAGAVAARIKI NIRODH YELAA TODAGAALO TELIYADU LEDAA MAGAVAARIKI NIRODH TODAGADAANIKI AMMAAYILU CHAALA SIGGU PADATAARU.</p> <p>Thoddeam cheddvank condom usar korunk khobor nasta vo customeracher condom galunk tim lostat?</p>	<p>Agree 1</p> <p>Disagree 2</p> <p>Neither agree or disagree 3</p>	
439	<p>there is no need to use condoms if we are using other methods for contraception</p> <p>(Agar hum koie aur garbha nirodhak cheez ka istamal kar rahe ho tho hume condom istamal karne ki zarurat nahin hoti hai)</p> <p>(Ondu vele bere yenadaru vidana anusarisuthiddare condom balasuva agathya illadirabahudu)?</p> <p>GARBHANIRODHANIKI (GARBHAM RAAKUNDAA) VERE PADHATULU UPAYOGISTUNNATLAYITE NIROH UPAYOGINCHALSINA AVASARAM LEDU.</p> <p>Gorv pois korpache anik dusre upai ghetam zalear, condom usar korpachi goroz nam.</p>	<p>Agree 1</p> <p>Disagree 2</p> <p>Neither agree or disagree 3</p>	

	Tumche khoxe bhair tumi kednai HIV topasnni kelea?		
507	Where did you have an HIV test against your wishes? (Aap ke marzi ke khilaf aap ki HIV ki test kahan par ki gayi?) (Nivu iechege virudhavagi HIV pariksha yelli madisikonde)? MEE ISTAANIKI VYATIREKANGAA MEEKU HIV PAREEXA EKKADA CHESHAARU? Tumche khoxe bhair HIV topasnni tumi khoim keli?	Govt. clinic or hospital 1 NGO clinic 2 Private Doctor 3 Home State 4 Other specify 12 Not applicable 13	
508	If you were very sick where would you go for health care? (Agar aap bahut bimar ho tho aap apna eelaj karne kahan jaogi?) (Neevu bahalavagi aarama illadudakkagi parikshegagi yelli hoguthiri)? MEEKU OKAVELA CHAALAA BAAGALEKAPOTE MEE AAROGYAM BAAGUCHESUKOVADAANIKI EKKADIKI VELAATAARU? Tumi chodd duent zalear bolaikecho upchar (treatment) korpak khoim vetat?	Govt. clinic or hospital 1 NGO clinic 2 Private Doctor 3 Home State 4 Other specify 12	
509	Why? (Es ki kya vajah hai?)	Cost of treatment 1 Elaj ka kharcha 1 Chikitsegagi karchu 1 CHIKITSAKAIYE KARCHU 1 Voizukecho upcharcho (treatmentacho) khorcho polleur 1 The way you are treated 2 Jis tarah elaj kiya jata hai 2 Ninna bagge adaradinda 2 MIMMALNI PAREEKSHICHE VIDHANAM 2 Tumkam adim treatment dila te bhaxen 2	

	<p>(Yava karanakkagi)?</p> <p>ENDU CHETA?</p> <p>Kiteak?</p> <p><i>Interviewer note: Let the participant answer spontaneously and then enter the appropriate code.</i></p>	<p>To avoid recognition as a sex worker 3 Mein dhandewalli hone ki pechaan na ho is liye 3 Neevu dhanda madu thiyendu tilibaradanta 3 DANDACHESE AMMAAYINANI EVARIKI TELIYAKOODADANI 3 Lingik dondeant kam korta, oxem ollkhunk naka mhunn 3</p> <p>Waiting time 4 Doctor ke intazaar ka samay 4 Bahala kala kaya be kaddarinda 4 DACTOR KOSAM VECHI UNDE SAMAYAM 4 Chodd vell ravunk poddta mhunn 4</p> <p>To avoid having an HIV blood test 5 HIV ke liye khoon ki jaach se bachane ke liye 5 HIV test tappisu vudakkoskara 5 HIV RAKTA PAREEKSHANU TAPPINCHU KONENDUKU 5 Rogtachi topasni HIV kollpak, naka mhunn 5</p> <p>Because they give injections 6 Kaun ki who injection da hai 6 Chuchu maddu koduvudarinda 6 VAALU SOODI VESTAARU KAABATTI 6 Te injectionam ditat mhunn 6</p> <p>Female Doctor 7 Doctorni hai 7 Hengasu vaidye 7 LADY DOCTOR KAABATTI 7 Bail Dotor mhunn 7 Male doctor 8 Mard doctor hai 8 Gandasu vaidye 8 MAGA DOCTOR KAABATTI 8 Dadlo doctor mhunn 8 Other / Specify 12 Anay 12 Itara/Namudisi ITARAALU/VIVARINCHANDI 12 anik dusrem kiteak lagun/sang 12</p>
<p>510 Now I am going to ask you about all of the health care services that you may have been in contact with for treatment of reproductive or sexually transmitted infections. I will ask you if you have been in contact with each of these services and then I will ask you a few questions about your experience with each of the services</p> <p>(Mein aapko gupt bimari aur prajanaan se judi bimari ke liye aap ne istamal kiye huie sari swasthya/aarogya sevao ke bare mein puchungi. Mein tumhe har ek seva ke bare me puchungi aur phir mein aap ko en sevao ke bare mein aap ka anubhav kya hai yeh puchungi.)</p>		

Yeega nanu nimage Gupta rogalalu bandaga neevu beti madida arogya kendra gala bagge mathu nimma anubhavada kurithu, pra shnegalanu kelathere

GUPTA ROGAALAKU INKAA GARBHAKOSHAVIAADHULAKU DORIKE ANI AAROgyASEVALATO MEEKUNNA SAAMBANDHAALA GURINCHI IPPUDU MIMMALNI NENU ADAGABOVUCHUNNAANU. MEEKU VEETILO OKKOKKADAANITO SAMBANDHAM MARIYU PRATI STALAMLO MEERU VELLINAPPUDU AKKADA MEEKEDURAINA ANUBHAVAALA GURINCHI KONNI PRASHNALU ADAGABOVUCHUNNAANU.

Atam hanv tumkam Vichartolom bolaikecho sovlotti gheupak konnaxim gheleat visve vattensun vo lingik vattensun zallea infectionak bolaikek upchar (treatment) gheupak geleat hache voir. Tumi osleo sovlotti ghetleat ani magir tumkam todde proxn vichartolom tumcho onbhov heam sovlottim voir.

Interviewer note: Go through this table one by one with the participant and ask have you had contact with service? How long did it take you from when you started to travel to the clinic until you got your treatment/medicine? Did the people working in the clinic make you feel welcome? What was the cost of the visit including the cost of medication? Would you go back to that clinic again?

Health care providers		Total time spent from deciding to go to the clinic to getting the medicine.	Did you feel welcome by the health providers	Cost of visit including medication cost	Would you go again?
Code	Yes 1, No 2	Time in minutes	Yes 1, No 2	Rupees	Yes 1, No 2
Govt. STD clinic					
NGO clinic					
Private clinic					
Govt. hospital					
Ayurvedic or homeopathic healer					

511	<p>Do you have any of these symptoms now?</p> <p>(Aap ko aage batayie hoie taklefo mein se abhi koie takleaf hai?)</p> <p>(Nimage yee kelagina tondaregalu iveya)?</p> <p>IKKADA CHEPPABADINA LAXANAALALO YEVAINA IPPUDU MEE KUNNAAYAA?</p> <p>Atam, tumkam hantleo khoincheo khunna asat?</p>	<p>Vaginal Discharge abnormal in colour or smell (Badan se bahut jayda jana aur uska rang alag hona ya <i>usme badvhu aana</i>) 1 Bili hoguvudu Adu hecchina banna atava durvasane Ide - 1 CHEDDA VAASANA VESE, ASAADAARANA RANGULO YONI SRAAVAM 1 Yonintlem vavop veglloch rong ani vas ieu n 1</p> <p>Genital ulcers sores or blisters (<i>yoni par fode aana ya chale padna</i>) 2 Jananagadalli ulsor atava guillegalu 2 MARMAAVAYAVAAL MEEDA PULLU, GULLALU LEKA PAGULLU 2 Potto sokol khasgi zageancher heridam khatre, suzop vo dadoll ievop. 2</p> <p>Lower abdominal pain not period pain (<i>Pate ke nichale taraf dard hona</i>) 3 Hotteya kelabaga dalli novu alla 3 POTTIKADUPULO NOPPI MUTTUNOPPI KAAKUNDAA 3 Potto sokoll dukh, nhoi mhoineachem zatanam dukh zata ti 3</p> <p>Irregular bleeding/bleeding or intercourse (<i>Aniyamit mahina aana/sambhand ke samay khoon aana</i>) 4 Akalada rakta shrava/sambogadinda aguva rakta shrava 4 KRAMAM TAPPINA RAKTA SRAAVAM/SAMBHO GAMLO RAKTASRAAVAM 4 Sextortanam (Lingik sombond dhortanam) 4</p> <p>Genital itching (<i>Yoni ke paas khujali hona</i>) 5 Jananagadalli turike 5 MARMAAVAYAVAALALO DURADA 5 Potta sokol khasgi suvatancher khorzop 5</p> <p>Pain or burning on passing urine (<i>pichap ke samay jalan hona ya dard hona</i>)6 Mutrada samaya uriyuvudu 6 MOOTRAM POSETAPPUDU MANTA LEKA NOPPI 6 Mutt'tana dukh vo uzo pettle'lea bhaxen divop 6</p>	If no go to section 6
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		Increased passing urine 7 (bahut jayda pishap hona) 7 Hecchina mutra visarjane 7 ADHIKANGAA MOOTRAM POVADAM 7 Chodd muttunk zavop 7 None 8 Khoinchench nhoi 8		
512	If you have vaginal discharge now, what is the colour of the discharge? (Agar aap ko badan se jane ki takleef ho rahi hai tho kya aap bata sakti hai ki uska raang kya hai?) (Nimage bili hoguva tondare iddare adu yava bannaddu? IPPUDU MEEKU YONI SRAAVAM UNNATLAITE ADI YE RANGULO UNDI? Zor tumchem yonintlem vavta zalear tacho rong koslo.	White 1 Yellow 2 Green 3 Grey 4 Other/specify 12		
513	Does it have an unpleasant smell? (Kya aap ke badan se jo jata hai usse gaandhie badbhu aati hai?) (Adu deurvasane olagagithe? ADI EMAINAA IBBANDIKARAMAINA VAASANA VESTONDAA? Haka koslo vaas marta?	Yes 1 No 2		
514	Do you have to change your undergarments and /or use sanitary towels? (Kya aap ko aapne antaar vastra/panty badalni padti hai aur/ya sanitary napkin ka istamal karna padta hai(kapda lena padta hai)?) (Nimma ola battegalanu badalisa bekaguthadeye? Athava janananga vanu thevaVagirura battegalanu upayogisabeka guthadeya)?	Yes 1 No 2		

	<p>MEERU LOBATTALU MAARCHADAM, SHUBHRAMAINA TAVALLU MAARCHADAM TARACHUGAA (MAATI MAATIKI) CHESTUNNAARAA? Tumkam tumche bhorle kopde bodlunk poddta nam zalear pad ghalunk poddta?</p>			
515	<p>How many times do you change your undergarments per day? (Ek din mein kitni baar aap ko aapne antaar vastra badalne padte hai?) (Ondu dinadalli nivu nima ola battegalanu estu saari badalis abekaguthde?) OKA ROJULO ENNISAARLU MEERU MEE LOBATTALU MARCHUKONTAARU. Tumi disak kitle pautti tumche bhorle koppde bhodoltat. <i>If they have any symptoms now explain they may have an STD and offer them a voucher for STD treatment</i></p>	Number		

section 6: SOCIO ECONOMIC QUESTIONS:			
Number	Question and filter	Coding Category	Code
601	<p>How many people do you support? (Aap kitne logoh ki dekhbhal karti hai?) (Neenu ninna samajadalli yestu janarannu poshisuthiri?) MEERU ENTAMANDINI POSHITUNNARRU? Tumi kitlea monxancho samball kortat?</p>	Total number	
602	<p>How many people do you support in your home village? (Aap ke gaun mein aap ko kitne logoh ki dekhbhal karni padti hai?) (Neevu nimna maneyalli yestu janarige poshisa bekagide?) MEE SWAGRAMAMLO MEERENTAMANDINI POSHITUNNAARU? Tumchea ganvant tumi kitlea lokancho samball korat?</p>	Total number	
603	<p>How many people under 18 do you support ? (Aap dekhbhal karne wale logoh mein kitne 18 saal se kaam umar ke hai?) (Neevu 18 varshada yestu janarannu posisuthi ri?) 18 SAMVATSARAALAKANNA TAKKUVA VAYASUNNA VAARINI ENTAAMANDINI MEERU POSHISTUNNAARU?</p>	Number	

	18 vorsa sokoll tumi kitlea monxeacho samball kortat?		
604	Are you in debt at the moment? (Kya abhi aap par karze ka boja hai?) (Neevu saala tegedu kondidira)? PRASTUTAM (IPPUDU) MEERU APPULLO UNNAARAA? Tumi atam kosleai rinant asat?	Yes 1 No 2 Do not know or refusal 14	
605	How much debt are you in? (Aap par kitne karze ka boja hai?) (Neevu yestu saaladalli iddiri)? MEERU IPPUDU ENTA APPU CHESI UNNAARU? Tumi kitlea rinant asat?	Rupees	
606	Do you own your accommodation? (Kya aap ka apna ghar hai?) (Nimage nimmade aada mane ideya)? MEERU NIVASINCHE STALAM MEE SWANTAMAA? Tumcho swatcho ravpacho zago asa?	Yes 1 No 2 Do not know or refusal 14	
607	Do you or your family have any other source of income? (Kya aap ko ya apke parivaar ko anayah kisi tarah se bhi paisa milta hai?) (Nimma kutumbakke bere yavudadaru adaya ideya)?	Yes 1 No 2 Do not know or refusal 14	

MEERU GAANEE MEE KUTUMBA ITARA SABHYULU (MEE INTLOVAARU) GAANEE VERE ITARA MAARGAALLO EMAINAA SAAMPAADISTUNNAARAA? Tumkam vo tumchea familik poixe ekttavpacho anik koslo dondo vo kam asa?		
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section 7: MENTAL HEALTH ASSESSMENT

No.	Question and filter	Coding Category	Code
701	<p>During the last month how often have you felt tired out for no reason</p> <p>(Pichale ek mahine mein kitni baar aap ko bina kisi wajah ke thakaan meehsus hoie hai?)</p> <p>(Kaleda tingalalli neevu yestu baari karanavillade sustada hage anisitu)?</p> <p>GATA NELALO ENTA TARACHUGAA (ENNISAARLU) MEEKU KAARANAM LEKUNDAA ALASIPOYINATLU ANI PINCHINDI?</p> <p>Gellea mhoineant karan nastanam tumkam kanseri zalea?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0 Yavagalu Alla 0 EPPUDDO LEDU 0 Kednach nhoi 0 A little of the time (<i>bahut kam bar</i>)1 Atiswalpa kala 1 CHAALA TAKKUVA SAMAYALLO 1 Samkea toddea vellar 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2 Kelavu bari 2 KONNI SAMAYAALLO 2 Toddea vellar 2</p> <p>Most of the time (<i>Bahut baar</i>) 3 Bahalastu baari 3 CHAALA SAARLU 3 Choddxea vellar 3</p> <p>All of the time (<i>Hameesha</i>) 4 Yavagalu 4 EPPUDDO 4 Sodanch 4</p> <p>Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14 Tiliyadu 14 NAAKU TELIYADU/JAVAABU CHEPPANU 14 Mhaka khobor nam vo hanv sangunk soddinam 14</p>	
702	<p>During the last month how often did you feel nervous?</p> <p>(Pichale mahine mein kitni baar aap ko adhirtha meehsus hoie hai?)</p>	<p>None of the time (<i>Kabhi nahin</i>) 0 A little of the time (<i>bahut kam bar</i>) 1</p>	

	<p>(Kaleda tingalalli neenage yestu baari hedarike aada hage anisittu)?</p> <p>GATAA NELALO ENTA TARACHUGAA MEERU MAANASIKA OTTIDIKI (AANDOLANAKU) LONAINAARU? Gellea mhoineant kitle pautti tumkam uchambollai zalea?</p>	<p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4 Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
703	<p>During the last month how often did you feel so nervous that you could not calm down? Pichale mahine mein aisa kitni baar hua ki aap itnie adhir ho gayie ki aap aapne aap ko shaant nahin kar saki?</p> <p>(Kaleda tingalalli nimage yestu baari samadana madalagadastu hedari ke aguthithu)?</p> <p>GATA NELALO MEERU ENTA TARACHUGAA TATTUKOLENANTA MAANASIKA OTTIDI (MANASU BAADHA) KU LONAINAARU? Gellea mhoineant tum kitle pautti ucamboll zaleat ki xant zaupak tumkam zaunk nam?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0</p> <p>A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4 Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
704	<p>During the last month how often did you feel hopeless? Pichale mahine mein aap ko kitni baar naomid laga?</p> <p>(Kaleda tingalalli yestu baari nimage nirasheaada hage anisithu)?</p> <p>GATA NELALO MEERU ENTA TARCHUGAA (ENNI SAARLU) NIRAASHA ANUBHAVINCHAARU? Gellea mhoineant kitle pautti tumkam bhorvanso naslo oxem dislem?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0 A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4</p>	

		Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14	
705	<p>During the last month how often did you feel restless or fidgety?() ?</p> <p>Pichale mahine mein aap ko kitni baar baichaine huie ya ashaant laga?</p> <p>(Kaleda tingadalli nimage yestu baari vishranthi yillada haage aguthitu)?</p> <p>GATA NELALO MEEKU ENTA TARACHUGA (ENNI SAARLU) VISIGIPOYINATLU MODDUBARIPOYINATLU ANI PINCHINDI</p> <p>Gellea mhoineant kitlea pautti tumi huskean bhorlole vo chintnest zalle?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0</p> <p>A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4</p> <p>Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
706	<p>During the last month how often did you feel so restless that you could not sit still?</p> <p>(Pichale mahine mein aisa kitni baar hua ki aap itni baichen ho gayi ki aap shaanti se beth nahin saki?)</p> <p>Kaleda tingalalli nimage yestu ayasa vagitho nimage kulithu kolluvastu purusothu iralilla.</p> <p>GATA NELALO MEEKU ENTA TARACHUGAA (ENNI SAARLU) OKACHOTA STHIMITANGAA UNDALENANTA VISUGU, ALASATA LEKA AVISRAANTI ANIPINCHINDI?</p> <p>Gellea mhoineant kitle pautti tumkam itli uchambollai zali ki tumkam xant zaunk zalenam?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0</p> <p>A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4</p> <p>Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
707	<p>During the past month how often did you feel sad or down?</p>	None of the time (<i>Kabhi nahin</i>) 0	

	<p>(Pichale mahine mein kitni baar aap dukhi huie ya aap ko udas laga?)</p> <p>(Kaleda tingalalli neenu yestu baari samadana tandu kollalagadastu dukhiyagidde atava kusididde)?</p> <p>GATA NELALO MEEKU ENTA TARACHU GAA (ENNI SAARLU) CHAALAA DEELAA PADIPOYINATLU, DI GULUGAA ANIPINCHINDI? Gellea mhoinenat tumi kitle pautti dukhest zallim?</p>	<p>A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4 Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
708	<p>During the past month how often did you feel so sad or down that nothing could cheer you up? (Pichale mahine mein aisa kitni baar hua ki aap ko itna dukh hua ki koie bhi baat aap ko hasa na saki?)</p> <p>(Kaleda tingalalli neenu yestu baari samadana tandu kollalagadastu dukhiyagidde atava kusididde)?</p> <p>YE VISHAYAMLO KOODA MEEKU ISHTAM LENATLU EDEE MEEKU SANTOSHA PARACHALENATLU MEERU DIGULUPADADAM, DEELAPADIPOVADAM GATA NELALO MEEKU ENTA TARACHUGAA (ENNI SAARLU) ANIPINCHINDI? Gellea mhoineant tumi kitle pautti dukhest zalim ki porot khush zaupak tumkam vell laglo?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0</p> <p>A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4 Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
709	<p>During the last month how often did you feel that everything was an effort?) (Pichale mahine mein kitni baar aap ko har kaam ek koshis ki tarah laga?)</p>	<p>None of the time (<i>Kabhi nahin</i>) 0 A little of the time (<i>bahut kam bar</i>) 1</p>	

	<p>(Kaleda tingalalli neenu yestu baari pratyendu prayathnavu bahala vichara madi madabekendu anisittu)?</p> <p>GATA NELALO ENTA TARACHUGAA (ENNI SAARLU) MEEKU PRATIVISHAYAM ENTO KASTAMGAA ANIPINCHINDI? Gellea mhoineant tumkam kitle pautt tumkam dislam ki sogllem aslem kasttigachem aslem?</p>	<p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4 Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	
710	<p>During the last month how often did you feel worthless?</p> <p>Pichale mahine mein aap ko kitni baar aisa laga ki aap nikammi hai (aap ki zindagi ka koie fayada nahin hai?)</p> <p>(Kaleda tingalalli neenu yestu baari bele yilla davalagidde)?</p> <p>GATA NELALO ENTA TARACHUGAA MEERU ENDUKOO PANIKIRANIVAARANI MEEKANIPINCHINDI? Gelle mhoineant kitle pautt tumkam dislam ki jivitacho kainch upeog nam / orth nam mhunn?</p>	<p>None of the time (<i>Kabhi nahin</i>) 0</p> <p>A little of the time (<i>bahut kam bar</i>) 1</p> <p>Some of the time (<i>Kabhi Kabhi</i>) 2</p> <p>Most of the time (<i>Bahut baar</i>) 3</p> <p>All of the time (<i>Hameesha</i>) 4 Do not know or refusal (<i>Pata nahin ya mana kiya</i>) 14</p>	

Section 8: VIOLENCE

No.	Question and filter	Coding Category	Code	
801	<p>Sometimes Regular male partner or husbands get angry and abuse their partners. Has your husband/RMP ever used threatening language (e.g he was going to hit you) or abusive (calling you names), accused you of having relationship with other men?</p> <p>(Kabhi kabhi niyमित/hameesha ka saathi ya pati gussa ho jate hai aur apne saathi ke saath bura vayavhar karte hai. Kya aap ke pati/niyमित saathi ne kabhi aap ko dhamkaya hai (jaise ki woh tumhe marne wala tha) ya bhala bura kaha (galle di), aap par kisi aur aadmi ke saath samband hone ka ilzaam lagaya?</p> <p>(Kelavu sala murd (dagad) atava gandandiru kopagolluthare mathu baiyuthare haage ninage ninna murd yavathadaru hodedidd ara atava baididdara atava bere gandasina jothe sambanda ittukondiddiyenda apaadanu horisiddara)?. KONNISAARLU TARACHUGAA (EPPUDOO) VELLE MAGA BHAAGASWWAMULU LEDAA BHARTALU VAARI AADA BHAAGASWAMULAMEEDA KOPAPADADAM LEKA VAARINI THITTADAM JARUGUTUNTUNDI. MEE BHARTA LEKA MEEDAGGARAKU TARACHUGAA VACHCHE BHAGASWAMI (KASTAMAR), MEERU BHAYAPADE VIDHANGAA EPPUDAINAA MAATLAADAARAA LEDAA PERLU PETTI THITTADAM GANI, VERE MAGAVARITO SAMBHANDAM UNDANI NINDINCHADAM GAANI CHESHARAA? Kednai tumcho sodancho dadlo sangati tumcher ragar zata. Tumcho dadlo tumkam kednai gaddieo, vaitt utram, vo nanvam mhonnta vo marta, ani dusrea dadleam lagim sombond dhorta mhunn dubhavta?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p> <p>Not applicable 13</p>		
802	<p>Has your husband/RMP ever hit you or physically hurt you?</p>	<p>Yes 1</p>		

	<p>(Kya aap ke pati/niyamit saathi ne kabhi aap ko maara hai ya?)</p> <p>(Nimma gandai yavagularu hodediddareya)?</p> <p>MEE BHARTA LEDAA MEE FIIX KASTAMAR MIMMALNI KOTTADAM GAANI, SHAREERAKANGAA BHADHA PETTADDAM GAANI CHESAARAA?</p> <p>Tumchea govan tuka kednam marlam?</p>	<p>No 2</p> <p>Do not know or refusal 14</p> <p>Not applicable 13</p>		
803	<p>Are there any other groups of people who threaten you or are violent to you? (Kya anya koie log hai jo aap ko dhamki dathe hai ya aap ko marte hai?)</p> <p>(Bere yava janaradaru nimmannu hedarisi ddareye)?</p> <p>INKAA EVARAINAA ITARA VYAKTULU MIMMALNI BHAYAPETTEVAARU GAANI, HIMSINCHE VAARUGANI UNNAARAA?</p> <p>Konnui lok tumkam domki ditat vo tumche lagim zogoddtat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p> <p>Not applicable 13</p>		
804	<p>If yes, Who?) [[list all] (Agar ha, tho kaun log? (Sabhi logo ka naam likhe)</p> <p>(Haudadare yaru)? (Patti madi)?</p> <p>UNNATTAYITE EVARU?(ANDDARINI LEKKINCHANDI)</p> <p>Hoi zalear konn?</p>			
805	<p>How many times have you felt physically threatened over the past week? (Pichale hafte mein kitni baar aap ko pite jane ka daar laga?)</p> <p>(Kaleda vaaradalli yestu baari nimage odediddare)?</p> <p>GATA VAARAMLO ENNI SAARLU MEERU SHAREERAKKANGAA (DEBBALAKU) BHAYAPADDAARU?</p> <p>Gellea sumanant tumkam konnei marpachi domki dilea?</p>	<p>number</p>		
806	<p>How many times have you been arrested or involved in a police raid over the past year?</p>	<p>number</p>		

	<p>(Pichale saal mein kitni baar aap ko giraftar kiya gaya ya aap police ke raid mein pakdi gayi? (Kaleda varushadalli yestu baari neevu policera custodiyali yiddi)? GATA SAMVATSARAMLO ENNI SAARLU MEERU POLICE RAIDSLO PATTUBADDARU LEDAA AREST AYYARU? Gellea vorsant kitle pautt tumkam policannim dhorleat vo raid marlea?</p>			
807	<p>For each episode tell me the place, amount of time spent in custody and amount of money spent to be released? .</p> <p>(Aap mujhe aapko kahan pakada gaya tha, aap ne havalat mein kitna samay bitaya, aap ko aapne aap ko chudane ke liye kitne paise dene pade?)</p> <p>(Yeega nimage polisaru yelli hidididdaru)? Alli neevu yestu samaya iddiri? Mathu nimanu bidisuvudakke yestu hana kottaru.</p> <p>PRATI SANDARBHAMLO ADI EKKADA JARIGINDI (RAID/ARREST) MEERU ENTA SAMAYAM ANDULO GADIPAARU, MARIYU MEE VIDUDALAKU ENTA DABBUU KHARCHU CHESAARU TELIYAJEYANDI</p> <p>Dor goddnek, mhaka ti suvat sang kitlo vell bonkonnint sarlo to ani kitle poixe modleant tumkam soddpak?</p>			
	Place	Time spent in custody	Money spent for release	other
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Section 9: DELIBERATE SELF-HARM

Number	Question and filter	Coding Category	Code
<p>There may be times in every one's life when they become very miserable and depressed and may feel like taking drastic action because of these feelings</p> <p>(Haar ek ki zindagi mein kabhi aisa ho sakta hai ki woh bahut mayuus aur dukhi ho jaye aur en bhavanao ki vajah se bahut hi bada kadam uthane ka unka maan kare)</p> <p>(Kelavu baari kelavarigi jeevanadalli viparitatada dukha mathu jigapse untadabahudadrinda jeevakke hani madikollabekendu anisuthade)</p> <p>PRATIOKKARI JEEVITAMLO, CHAALAA DAYANEEYAMAINA, DIGULUKALIGINCHE SAMAYAALU RAAVACHCHU ALAANTI PARISTITULALO VAARU CHAALAA VIPAREETA MAYINA PANULU CHEYADAANIKI SIDHDHA PADATAARU?</p> <p>Kaim vell jednam eklo dukhest/chintest zata tednam to osleam bhavnnank lagun kitem-l gombir/vaith korunk yokta.</p>			
901	<p>In the past three months have you felt that life isnt worth living or have you wished that you were dead? (Pichale tin mahino mein kya aap ko aisa laga hai ke zindagi jine ka koie matlab nahin hai ya aap ko maar jaane ki eecha huie?)</p> <p>(Kalida muru tingalalli yestu saari sayuva alochanegalu manassige bandive)?</p> <p>GATA MOODUNELALALO MEEKU EPPUDAYINAA BRATAKADAM VRUDHAA ANIKAANI LEKA CHANIPOVAALANIKAANI ANIPINCHINDAA?</p> <p>Pattlea tin mhoineanim tumkam dislam ki jivitak kaim orth nam mhunn vo tumkam morpachem dislam?</p>	<p align="right">Yes 1</p> <p align="right">No 2</p> <p align="center">Do not know or refusal 14</p>	
902	<p>In the past three months, have you thought of killing yourself? (Pichale tin mahino mein kya aap ne apne aap ko marne ke bare mein) (jaan lene ke bare mein) socha hai?)</p> <p>(Kaleda 3 tingalalli athma hatye madabekendu anisideya)?</p>	<p align="right">Yes 1</p> <p align="right">No 2</p> <p align="center">Do not know or refusal 14</p>	

	<p>GATA MOODU NELALALO MEEREPPUDAYINAA CHANI POVALANI PRAYATNICHAAARAA? Pattlea tin mhoinneanim kednai tumkam jiv gheupachem dislam?</p>		
903	<p>Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way? (Kya aap ne kabhi kisi tarah ki bahut jayda golliyen kaah kar ya kisi aur tarah se apni jaan lene ki koshis ki hai?) (Neevu yavagaladaru mathregalannu tegedukondu athmahatte madalu anisiddeya)? EKKUVAGAA MAATRALU MINGADAM DWARA GAANI LEKA VERE EE VIDHANGAANAINAA CHANIPOVALANI MEEREPPUDAINAA PRAYATNINCHAAARAA? Tumi kednai tumcho jiv gheupacho proitn kela, zaun zaiteo tablets gheun vo anik dusre upai gheun?</p>	<p>Yes 1 No 2 Do not know or refusal 14</p>	
904	<p>Have you deliberately harmed yourself in any way but not with the intention of killing yourself, for example making cuts on your forearm? (Kya aap ne kabhi kudhko kisi tarah ki hani pahuchane ki koshis ki hai, magar tab aap kudh ko marna nahin chahate the, udharan apne haat par kaat lena?) (Sayuva uddeshadalli nimma jeevakke neeve hani madiddira (kaiya mele gaya)? MIMMALNI MEERE EPPUDAINAA KAAVAALANE BAADHA PARACHU KONNARAA (CHAAVAALANI KAAKUNDAA) UDHAHARANAKU MEE CHETI MANIKATTUNU KOSUKOVADDAM LANTIVI? Tumi kednai zobordosten tumkam dukoileat punn jiv gheupache axen nhoi. Dekhik tumchea hatak ghave ghalun?</p>	<p>Yes 1 No 2 Do not know or refusal 14</p>	
If no to all of the above go question no 908			

905	<p>Did you do any of these things to draw attention to your situation or to change your situation? For example you were angry with your RMP or husband?</p> <p>(Kya aap ne aisa es liye kiya hai ke aap kisi ka dhayan apni paristithi ke taraf lana chahate thae ya aapni paristithi ko badalna chahate thae? jaise ki mano aap apne pati/ niyami saathi se naraj thi?)</p> <p>(Nimma paristiyanu sari madikolluva uddeshadinda nimmavara gamana seleyalu prayatna madiddira)?</p> <p>MEERU MEE PARISTITULANU MAARCHUKOVALANI GAANI LEKA EVARIDRUSHTILONAINAA PADAALANI KAANI AA VIDHANGAA CHESAARAA? UDAAHARANAKU MEE BHARTA LEEKA UNCHUKONNA VAARI MEEDA KOPAM VACHCHI</p> <p>Tumi hantleo khoincheo vostu goddnek mon oddbak vo goddni bodolpak keleat? Dekhik tumi tumchea govacher vo dadlea sangateacher ragar zaleat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
906	<p>Did you do any of these things because it relieved unpleasant feeling of anger, tension, anxiety or depression?</p> <p>(Kya aap ne aisa gussa, tanav, Chinta ya udasie jaisi bhavanao se rahat milne ke liye kiya?)</p> <p>(Nimma kopa asamadana jigupse, galinda mukti sigalu neevu yee yavudannadaru upayogamadiddira)?</p> <p>MEEKU BAADHA KALIGINCHE AALOCHANALANUNCHI KOPAM, AAVESHAM, AADURDAA LEDAA DIGULLANUNCHI BAYATA PADAALANI MEERU IVANNI CHESAARAA?</p> <p>Tumi hantleo khoincheo vostu rag pois korpak chitnam vo niraxiponn pois korpak keleat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
	<p>I want you to think about last year again:</p> <p>(Ab mein chahati ho ke aap phir se pichale saal ke bare mein soche:)</p>		

	<p>Ega neevu hoda vavushada bagge nenapu madabeku NENU MIMMALNI TIRIGI GATA SAMUATSARAMGURINCHI AALOHINCHAMANI ADUGUCHUNNAANU.</p> <p>Gellea vorsachem tumi anik ek pautt chintlelem mhaka zai?</p>		
907	<p>Compared to last year do you find that you are deliberately self harming?</p> <p>(Pichale saal ke hisaab se kya aap ko aisa laag raha hai ke aap apne aap ko kudh hokar haani pahucana chahati hai?) (Kaleda varushakke holisidare neevu uddeshapurvakavagi swatha himsisiddira)?</p> <p>GATHA SAMVATSARAMTO POLCHI CHUSTE MIMMALNI MEERU IPPUDU EKKUVAGAA BAADHAPARAACHU KONTUNNATLU ANIPISTUNDAA? Gellea vorsak sor kelear vo gel'lea ani hea vorsak pollelear tumkam dista ki zobordosten tumi tumkam dukhoileat mhunn?</p>	<p>More 1</p> <p>Same 2</p> <p>Less 3</p> <p>Not applicable 13</p>	
908	<p>Interviewer to observe: Are there any visible signs of self harm e.g. systematic cuts on arms?</p>	<p>Yes 1</p> <p>No 2</p> <p>Cannot see 13</p>	

Interviewer note: If they answer yes to any of these questions tell them that these sorts of thoughts and feeling we have talked about here are vey serious and it is important that you talk to someone, for example arrange for them to meet with a counsellor from positive people, the peer educators or doctor or ARZ.

No.	Question and filter	Coding Category	Code
1001	<p>Can you leave the trade whenever you wish to?</p> <p>(Kya aap apni marji se dhanda karna baandh kar sakti hai?)</p> <p>(Nimage bekada samayaddlli yee vrathiyinda horage barabahuda)?</p> <p>MEEREPPUDU KAAVAALANTE APPUDU EE VRUTTINI MEERU VADALIVEYAGALARAA?</p> <p>Tumche khoxen tumkam zai tednam tumchean ho dondo soddunk zata?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
1002	<p>Do you have money that you can use as you wish?</p> <p>(Kya aap ke paas paisa hai jo aap apni marji se kharch kar sakti hai?)</p> <p>(Bayake banda hage karchu Madalu hana ideya)?</p> <p>MEERU ISHTAM VACHINATLLU KHARCHU PETTUKOVADAANI MEEDAGGARA DABBUNDAA?</p> <p>Tuje khoxe pormonnem tumkam despezak modpache poixe asat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
1003	<p>Have you ever voted in an election?</p> <p>(Kya aap ne kabhi election mein vote dala hai?)</p> <p>(Chunabaneyalli vote hakiddira)?</p> <p>MEEREPPUDAYINAA ENNIKALALO VOTU VESAARAA?</p> <p>Tumi electionak kednam mot ghala?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
<p>I am now going to ask you about reasons why you work in Goa. Which of the following describes your reason for staying and working in Goa. (Ab mein aap ko aap Goa mein kaam kaun kar rahi hai es bare mein kuch saval puchungie. Aage bataie vajaho mein se Goa mein rahene aur kaam karne ki aap ke konsie vajah hai?)</p> <p>(Neevu yavakaranakke goa dalle iddiri yemba bagge prashne galannu keluthene kelage helida karanagalalli yava karanavu neevu goadalli nillalu mathu illi kelasa madalu karanava girabahudu)</p>			

MEERU GOVAALONE PANICHEYAALANUKOVADAANIKI GALA
 KAARANAALAMEEDA NENU IPPUDU MIMMALNI KONNI PRASHNALADA
 GABOVUCHUNNAANU. IKKADA CHEPPINA VAATILLO EDI MEE KAARANAANNI
 TELIYAJESTAADI.

Tumi goeant koslea karannak lagun kamak asat, hem vicharunk soddtam?

<p>1004</p>	<p>I stay here because this is desirable place to live (Mein yaha rehatie ho kaun ki yeh jagah raheneke liye achi hai.) (Idu vasisalu anukulakaravada stala vaddarinda) IKKADA JEEVITAM CHAALAA BAAGUNDI ANDUKANE NENU IKKADA UNTUNNAANU (Hanv hanga ravta kiteak hi ravpa sarki survat mhunn?)</p>	<p>Yes 1 No 2 Do not know or refusal 14</p>	
<p>1005</p>	<p>I stay here because it is preferable to living in my home village (Mein yaha es liye rahati ho ke yeh jagah mere gaun se baehatar/aachi hai). (Nanna oorigintalu yee jaga olledu ide)? SONTA OORIKANNAA IKKADA CHAALAA BAAGUNDI. ANDUVALLA NENU IKKADE UNTUNNAANO. Hanv hanga ravta kiteak amchea ganva poros hanga ravpak boream?</p>	<p>Yes 1 No 2 Do not know or refusal 14</p>	
<p>1006</p>	<p>I stay here because I want to be with my husband/ regular male partner (Mein yaha rahate ho kaun ki mera pati/niyamit saathi yaha hai) (Nanna dagad/Ganda/Murd yilli Iddarinda)? NAA BHARTA (LEKA NENU UNCHUKONNA VYAKTI) TO KALASI UNDAALANUKONTUNNAANU KAABATTI NENU IKKADANEUNTUNNAANU.</p>	<p>Yes 1 No 2 Do not know or refusal 14 Not applicable 13</p>	

	Hanv hanga ravta kiteak mhaka mhojea ghova vo sodanchea dadlea sangatak ravpak zai?		
1007	<p>I stay here because I have no other place to go.</p> <p>(Mein yaha rahati huo kaun ki mujhe jane ke liye koie aur jagah nahin hai)</p> <p>(Nanage bere stala hogalikke illaddarinda illiddene)? NAAKU INKA EKKADA UNDENDUKU STALAM LEDU KAABATTI NENU IKKADANE UNTUNNAANU.</p> <p>Anik khoim vochpak suvat nam dekhun hanv hanga ravta?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
1008	<p>I stay here because I am forced to</p> <p>(Mujhe yaha rehane ke liye majboor kiya hai).</p> <p>(Yilli nilluvudakke nanage balavanta madiddare)? NANNIKKADA BALAVANTANGAA UNCHAARUKAABATTI NENUIKKADA UNTUNNAANU.</p> <p>Mhaka boll kelam dekhun hanv hanga ravtam?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
1009	<p>Where do you see yourself in the future:</p> <p>[tick the one that they say is most applciable]</p>	<p>Become independent sex worker 1 Swatantra dhanda karna chahati ho 1 Swanthavagi dhanda Maduvudu 1 SONTANGAA DANDAA CHESUKOVAALANUKONTUNNAANU 1</p> <p>Mhaka indepentent vo svotontr lingik dondo korpi zaunk zai 1 Become a Garawali 2 Garawali banna chahati ho 2 Yajamaniyaguvudu 2 GARWALI KAAVAALANUKUNTUNNAANU 2 Mhaka Gharwali zaunk zai 2</p>	

	<p>(Aap bhavishya mein apne aap ko kya karte hue dekhte hai:)</p> <p>(Bhavishyadalli nimmannu neevu ghege nodalu ichisuthiri)?</p> <p>RAABOYE ROJULALO MEERU ELAA UNDAALANUKON TUNNAARU?</p> <p>Tumkam tumcho fuddar koxo dista?</p>	<p>I cannot imagine the future 3 Bhavishya ke bare mein soch nahi sakti 3 Bavishyada bagge yochisalare 3 NAA BHAVISHYATTU GURINCHI NENU AALOGHINCHALENU 3 Mhaka fuddarachem chintunk naka (zainam) 3</p> <p>Continue as I am 4 Abhi ki tarah hi rahugi 4 Ide riti munduva riyuvudu 4 IPPUDU UNNATLE 4 Mhaka asa toxem ravunk zai 4 Leave sex work 5 Dhandha chod dungu 5 Dhanda biduvudu EE DANDAA VADILI VEYAALANUKONTUNNAANU 5 Mhaka ho lingik dondo soddunk zai 5</p> <p>Other /Specify 12 ITARAALU/VIVARINCHANDI 12 Ani dusrem kitem 12</p>
1010	<p>Why? (Kaun?) (Yeke)? ENDUKU? Kiteak?</p>	
1011	<p>If you had a personal problem or were feeling low whom would you turn to for support? Tick all that apply.</p> <p>(Agar aap ko koie niji takleef ho ya aap ko udaas lag raha ho tho aap kisse maadat le sakti hai?)</p> <p>(Nimagenadaru tondare galu bandare neevu yara ha hira sahayakke hoguttiri)?</p> <p>MEEKEDAYINAA SWANTA SAMASYALUNTE LEDAA MEERU CHAALAA VICHAARANGAA UNTE SAHAAYAM KOSAM EVARIDAGGARIKI VELATAARU?</p> <p>Tumcho svotacho Khasgi proxn vo dukh ailam tednam tumi konnacho adhar sodla?</p>	<p>regular male partner 1</p> <p>Garawali 2</p> <p>Other girls 3</p> <p>Family member/specify 4</p> <p>Religion (for example priest or temple) 5 NGOs/peer educators</p>

		6 Police 7 No one 8 Other/Specify 12	
1012	<p>Has there been a time in the past few weeks that you have felt you have no one to turn to for support?</p> <p>(Kya pichale kuch hafto mein aap ko aisa laga hai ki aap ko maadat karne wala koie nahin tha?) (Ye kaleda tingalalli nimage yaru sahayakke yillada hage anisideya)?</p> <p>GATA KONNI VAARAALO EPPUDAINAA MEEKU DIGULUGAA UNNAPPUDU SAHAAYAMGAA GAANEE BAADHA PANCHU KOVADAANIKIGANI MEEKEVARU LERANIPINCHINDAA?</p> <p>Gellea sumanannim tumchea jivitant oslo vell aila ki tumkam adhar gheupak konn naslo vo nam mhunn?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	

section 11: SUBSTANCE USE:

Number	Question and filter	Coding Category	Code
<i>Interviewer note ask the question and then if they say yes probe how often</i>			
1101	Do you drink alcohol? (Kya aap sharab piti hai?) (Neevu sharabu kudyuthira)? MEERU SAARAYI (MANDU) TAAGUTAARAA? Tumi soro pietat?	Everyday 1 More than once a week 2 One a week 3 Once in a month 4 Never 5 Only with customers 6	
1102	Do you smoke? (Kya aap cigaratte piti hai?) (Neevu sigeretu atava tambaku seduthira)? MEERU POGA TAAGU TAARAA? Tum cigretti/bidi ghetat?	Everyday 1 More than once a week 2 One a week 3 Once in a month 4 Never 5 Only with customers 6	
1103	Do you chew Gutka or tobacco? (Kya aap gutka ya tambaku kathi hai?) (Neevu pan gutka vannu tinnuthira)? MEERU GUTKAA GAANEE POGAAKU GAANEE TINTAARAA? Tumi pan vo dumti ghetat?	Everyday 1 More than once a week 2 One a week 3 Once in a month 4 Never 5 Only with customers 6	

section 12: KNOWLEDGE/BELIEFS AND PERCEPTION OF RISK, HIV AND STI

No.	Question and filter	Coding Category	Code
1201	<p>Have you ever heard of HIV or AIDs? (Kya aap ne kabhi HIV ya AIDS ke bare mein suna hai?) (Aids/Hiv bagge keliddira)? HIV LEKA AIDS GURINCHI MEEREPPUDAINAA VINNAARAA? Tumi kednai HIV vo AIDS achem aikolam?</p>	<p>Yes 1 No 2 Do not know or refusal 14</p>	Skip to 1220
1202	<p>Where did you hear about HIV/AIDs? (Aap ne HIV/AIDS ke bare mein kaha suna?) (Neevu HIV/AIDS bagge yelli keliddira)? HIV/AIDS GURINCHI MEERU EKKADA VINNAARU? HIV/AIDS anchem tumi khoim aikolam? <i>Interviewer allow them to answer spontaneously and enter all that apply</i></p>	<p>School 1 Television or radio 2 Newspapers or magazines 3 Friends or other Sex workers 4 Pimps, pilots, Garawali or Lodge owner 5 Peer educators or NGOs 6 Doctors or other health care workers 7 Other/specify 12</p>	
1203	<p>Is there a cure for HIV/AIDs? (Kya HIV/AIDS ka eelaj hai/ puri tarah se thek ho sakta hai?) HIV/AIDS gunavaguthade ya? HIV/AIDS NUNCHI BAAGUPADDA GALAMAA? HIV/AIDS bori zaunk xokta?</p>	<p>Yes 1 No 2 Do not know 3</p>	
1204	<p>In which of the following ways can HIV be transmitted? (HIV kin taraho se fael sakta hai?) (Yee kelagina vugalalli hiv haraduva vidhana galu yavuvu)? IKKADA CHEPPABADINA VETIDWARA HIV SOKUTUNDI? Khoince vattensun vo khoince bhaxen HIV ximpodda?</p>	<p>Yes 1, No 2, Don't know 3</p>	
i	<p>Kissing a person with HIV (HIV honewale vykati ka chumban karne se) (HIV iruvavarige mutthu kottare)? HIV UNNA VYAKTINI MUDDUPETTUKONTE</p>		

	(HIV zallea monxak umav (Kissing) gheun?		
ii	<p>Injections with a syringe used to inject someone with HIV (Jis suie se HIV infected vyakti ko injection diya jata hai ussi suie se injection kiya jana)</p> <p>(HIV iruva vyaktige upayogisida suji yannu upayogisidare)?</p> <p>HIV UNNA VYAKTIKI ICHCHINA SOODITO, SOODI VESUKONTE HIV patientak injection korunk vapurleli vaprun syringe usar kelear?</p>		
iii	<p>Shaking hands with a person with HIV (Jise vyakti ko HIV hai usse haat milana)</p> <p>(HIV iruva vyaktiya kai kulukuvudarinda)</p> <p>HIV UNNA VYAKTI TO CHETULU KALIPITE (HIV zalea monxa kodden hat melloilear?</p>		
iv	<p>Receiving a blood transfusion with blood infected with HIV (HIV kitanu se infected (Badit) hue khoon se)</p> <p>HIV iruva vyaktianda raktha tege du kondare</p> <p>HIV UNNA VYAKTI RAKTAANNI RAKTA MAARDIDIKOSSAM TEESUKONTE (HIV zallea monxachem rogot ghetlear zata?</p>		
v	<p>Being born to a mother infected with HIV (HIV pidit maa ke baache ko)</p> <p>(HIV iruva hengasina ahotteyalli huttidare)</p> <p>HIV UNNA TALLIKI BIDDAGAA PUTTITE (HIV zalle avoichea bhurgeak)</p>		
vi	<p>Mosquitos bites (Machar ke katne se)</p> <p>(Solleya kadithadinda)</p> <p>DOMAKAATU DWARA (Kimsanim chablear?)</p>		
vii	<p>Breathing air from a person with HIV (HIV pidit vyakti ke saath saas lene se)</p>		

	<p>(HIV iruva vyakti ya baiyinda gali sevisidare) HIV UNNA VYAKTI DAGGARA OOPIRIPEELCHITE. (HIV zallea monxacho svas gheun?)</p>		
viii	<p>Sharing food with a person with HIV (HIV pidit vaykti ke saath khana khane se) (Onde tatte yalli oota madidare) HIV UNNA VYAKTITO AAHAARAANNI PANCHUKONTE. HIV zalleamonxachem jevonn jevun?</p>		
ix	<p>Sharing a toilet with a person with HIV (HIV pidit vyakti jo sandas istamal karta hai woh sandas istamal karne se) (HIV iruva vyakti upayogisida kakkosu upayogi sidare)? HIV UNNA VYAKTI UPAYOGINCHINA MARUGUDODDI UPAYOGISTE HIV zallea monxacho toilet vaprun?</p>		
x	<p>Unprotected sexual intercourse with a person with HIV (HIV pidit vyakti ke saath asurakshit samband rakhne se) (Yava nirodhaka galannu balasade laingika samparka madidare HIV UNNA VYAKTI TO EE JAAGRATTALOO TEESUKOKUNDA SEXLO PALGONTE (ASURAKSHITA SAMBHOGAM CHEYADAM) HIV zallea monxea lagim condom nastanan kuddicho sombond zoddun?</p>		
1205	<p>In which of the following ways can you protect yourself against contracting HIV? (Aage bataye huae pariyayao mein se kis tarah aap apne aap ko HIV se bacha sakte hai?) (Yee kelagina vidanagalalli hiv baradanthe hege tammanne tavu kapadabahudu) IKKADA CHEPPA BADINA VETI DWARA HIV ANTAKUNDAA MIMMALNI MEERU KAAPAADUKOGALARU HIV sun, ani khoince toren tumi tumcho samball korun ieta?</p>	Yes 1, No 2, Don't know 3	

i	Vaccination (Las dene se) (Chuchu maddininda) TEEKAA VEYINCHUKOVADAM? (Vaccination)		
ii	Regular visits to allopathic doctor (Golli denewale doctor ke paas niyamit jane se) (Kala kalakke vaidyarannu beti maduvudarinda) ENGLISH DOCTOR VADDAKU KRAMAM TAPPAKUNDAA VELLADAM? (Sodam voizak bhett korun)?		
iii	Use a condom when having sex (Saamband ke samay condom ka istamal karne se) (Laingika samparka maduvaga condum na balakeinda) SAMBHOGA SAMAYAMLO (SEXLO) NIRODH UPAYOGINCHADAM (Condom Vaprun)		
iv	Only have sex with healthy looking men (Sirf hatekate dikhane wale aadmi ke saath samband rakhne se) (Arogyadinda iruva gandasina jotho laingika samparka maduvudarinda) (AAROgyAMGAA KANIPINCHE MAGAVAARITO MAATRAME SAMBHOGAM (SEX) CHEYADAM. (Fokot bori bolaiki axillea dadlea lagim sombond dhorun)		
v	Using allopathic medicines (Allopathic dayaiyan khaane se) (alopathic maddininda) ENGLISH MANDULU UPAYOGINCHADAM (Dotoram dillim vokdam vaprun)		
vi	Use Ayurvedic/Homeopathic/Traditional Healers (Ayurvedic dava lene se) (Ayurvedic maddininda) AYURVEDA MOOLIKALANU UPAYOGINCHADAM Zadd paleachim vokddam vaprun?		
vii	Praying or giving gifts to god		

	(Bhagwan ko pratana karne se ya prasad chadane se) Devara hattira beduvudarinda DEVUNIKI PRATHINCHADAM LEDAA DEVUDI KI MUDUPULU CHELLINCHADAM Magnnem vo devak dannam diun?		
1206	Have you personally made any changes in your sexual behaviour to avoid getting HIV? (HIV se apne apko bachane ke liye kya aap ne apne lyangik vyahar mein kuch badlav laya hai)? (Neevu nimma sambogadalli hiv yannu tadagattalu yenadaru badalavane yannu madiddira) HIV RAAKUNDAA TAPPINCHUIKUNENDUKU MEE SAMBHOGA (SEX JARIPE) PADHDHA TULLO SONTANGAA MEEREMAYINAA MAARPULU CHESUKONNAARAA? Tumi swatan lingi sobhav bodlunk ani HIV zaupache pois korunk kitem proitn kelam vo upai ghetla?	Yes 1 No 2 Do not know or refusal 14	Skip to 1224
1207	If yes what changes? (Agar ha to Kya badlav kiya hai)? (Haudadare yava badalavanegalu) ALAA CHESUKONI UNTE AA MARPULU EMITI? Hoi zalear kitem bodolam?		
1208	When did you start making these changes? (Ye badlav apne kab kiya hai)? (Yee badalavanegalanu madalu yavagadinda shuru madiddira) EE MARPULU CHEYADAM MEERU EPPATINUNCHI PRARAMBHINCHARU Him bodlopam korpak tumi kednam suru kelam?	record in months	
1209	Have you ever had an HIV/AIDS education session? (Kya apko kabhi HIV/AIDS ki mahiti/jankari mili hai)? (Yavathadaru HIV/AIDS bagge karyakramadalli bagavahisiddira)? HIV/AIDS NU GURINCHINA BODHANAA TARA GATULLO MEEREPPUDAYINAA PAALGONNAARAA?	Yes 1 No 2 Do not know or refusal 14	Skip to 1211

	Tumi kednam HIV/AIDS achem xikvonn aikolam?		
1210	<p>Have you had an HIV/AIDS education session or talked about HIV/AIDs with a peer educator in the past three months? ? (Pichle tin mahino mein kya apko kisi sanstha ke vyakti ne HIV/AIDS ki jankari di hai ya HIV/AIDS ke baremein baat ki hai)?</p> <p>(Yi 3 tingalalli neevu HIV/AIDS bagge karyakra madalli bagavahisiddira)? GATA MOODU NELALLO MEERU HIV/AIDS BODHANAA TARAGATULLO PAALGUNADAMGANNI LEKA HIV/AIDS GURINCHI MEEKORAKU PANICHESE (PEERS) VARITO MAATLAADADAM GAANI JARIGINDAA?</p> <p>Gellea tin mhoineannim tumi kedna HIV/AIDS achem xikvonn aikolea vo tumchea ixttam koddlean aikolam?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
1211	<p>Have you ever received condoms during an HIV/AIDS education session or from a peer educator? (Kya kabhi HIV/AIDS ki mahiti satra mein ya kisi sanstha ke vykati ne apko condom diye te)</p> <p>(HIV/AIDS na karyakramadalli nimage condom kottidara)? HIV/AIDS BODHANAA TARAGATULLO GAANI LEKA MEE TO PANICHESE PEERS DWARAGAANI MEEREPPUDAINAA NIRODH TEESUKONNAARAA?</p> <p>Tumkam kednai HIV/AIDS sessionant condoms ghetleat vo tumchea ixttam koddlean ghetleat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Do not know or refusal 14</p>	
	<p>Which of the following statements do you agree with (Aage batayi gayie bato mein se ap kaunsi baat ke saat sehemat hai/apko sahi lagti hai)?</p> <p>(Yi kalagina prashnegalalli neevu yavudakke opputhuri)? IKKADA CHEPPABADINA VETITO MERU ANGEEKARISTAARU/VETINI MEERU OPPUKONTAARU. Sokoileo khoincheo vako tuka zai teo hoi mhonn</p>		

1212	<p>I am tired of listening to sessions about HIV (HIV ke bhare mein jankari suon suon ke thak gayie)? (Nanage HIV ya karyakrama keli sakagide)? (HIV KI SAMBANDHINCHINA TARAGATULU VINI VINI VISIGIPOYANU (Hanv HIV chem xikvon aikonn vagelam?</p>	<p>Agree 1 Disagree 2 Neither agree or disagree 3 Not applicable 12</p>
1213	<p>I think I am at risk of catching HIV from customers (Mujhe lagta hai ki mujhe apne grahak/customer se HIV ho sakta hai) (Nanage anisuthade HIV girakigalinda baruva sadyate ide)? (NENU KASTAMARDWARA HIV ANTINCHUKONE PROMAADAMLO UNNAANANI NENANUKUNTUNNAANU. Customera koddlean HIV Zavpachi bhirant asa oxem maka dista.</p>	<p>Agree 1 Disagree 2 Neither agree or disagree 3</p>
1214	<p>Coconut Oil used as lubricant can cause condom breakage . (Chiknayi ke liye khobre ka tel istamal karne se condom tut sakta hai) (Kobbari yenne upayogisubudariuda condom haridu hoguva sadyathe ide)? (VADULUGAA ((LOOJU GAA) UNDEDAANIKI KOBBARINOONE UPAYOGISTE ADI NIRODH PAGALADAANIKI KAARANAM KAAVACHCHU. Narlachem tel dondo/sombond dovortanam usar kellear condom funta</p>	<p>Agree 1 Disagree 2 Neither agree or disagree 3 Don't Know 4</p>
1215	<p>I think I am at risk of catching HIV from my regular male partner (Mujhe lagta hai ki mere niyमित/hamesha ke sathi se mujhe HIV ho sakta hai) (Yavathu barua girakiyinda HIV/AIDS baruva sambava ide)? (NENU NAA MAGA BHAAGASWAMI DWAARAA HIV ANTINCHUKUNE PRAMADAMLO UNNAANANI NENA NUKONTUNNAANU</p>	<p>Agree 1 Disagree 2 Neither agree or disagree 3 Not applicable 12</p>

	Mhojea sodanchea dadlea sangatea barabor sombond dovrun HIV zaupak xokta oxem mhaka dista		
1216	I cannot get HIV from someone I love (Jishe mein pyar karti hu usse mujhe HIV nahi ho sakta hai) (Nanu yarannadaru preethi madidari HIV/IDS baruvudilla)? (NENU PREMINCHE ATANI DWARAA NAAKU HIV RAADU Hanv mog korta tajea koddlean mhaka HIV zaina	Agree 1 Disagree 2 Neither agree or disagree 3	
1217	I do not believe I can catch HIV (Mujhe nahi lagta hai ke mujhe HIV ho sakta hai) (Nanage alochisalu aguvudilla nanage HIV bara bahudendu)? (NAAKU HIV VASTUNDANTE NENU NAMMANU Mhaka HIV zatli munn hanv sot manina	Agree 1 Disagree 2 Neither agree or disagree 3	
1218	All the talk about HIV has frightened the customers away (HIV ki baaton ne grahakon ko dara diya hai) (HIV bagge charchegalu giragigalinda doora madide)? EE HIV KI SAMBANDHINCHINA MAATALANNEE KASTAMARLANU BHAYAPETTI TARIMESTUNNAAYI HIV chi khobor aikonn amche customer soglle bhieun ghele	Agree 1 Disagree 2 Neither agree or disagree 3	
1219	Two condoms are better than one in preventing me from catching HIV (Apne apko HIV hone se bachane ke liye do condom ka istamal karna ek condom ke istamal karne se jayda acha hai)? (2 condomgalu HIV baruvudannu tadeyabahudu)? HIV RAAKUNDAA NANNU NENU KAAPAADUKOVADAANIKI OKATIKANNAA RENDU NIRODHLU VAADITE MANCHID Don condom borabor usar kellear HIV vik pois khorpachi xokia asa	Agree 1 Disagree 2 Neither agree or disagree 3	
1220	Have you ever known a person with HIV/AIDS? (Kya aap kabhi Kisi HIV/AIDS huie vyakti ko janti hai)? (Nimage HIV iruva janara parichaya ideya)?	Yes 1 No 2 Do not know or refuse to answer 14	

	HIV/AIDS UNNA VYAKTI GURINCHI MEEKEPPUDAINAA TELUSAA? HIV/AIDS zalea monxeak ollkhotai?			
1221	Why do you believe they caught HIV? (Ap ke mutabe/hisab se unko HIV kuan hua tha)? (Avarige HIV hege bandira bahudendu nima nambike)? VAARIKI HIV UNDANI MEERU ELAA NAMMUTAARU? Tuka koxem dista tankam HIV zalea mhunn			
1222	Some people feel these are some of the reasons why women complain of Vaginal discharge. I want to ask you which of these reasons do you think cause vaginal discharge? (Kuch logon ko lagta hai ke age bhatayi hui vajah se aurton ko badan se jane ki takleef hoti hai. Mein apse ye puchna chahati hu ki kin vajahao se badan se jane ki takleef hoti hai)? (Kelavu hengasaru bili hogunikege kelaav karana he labahudu hage ninna prakara hege bile hogivudu hegira bbudu)? YONI SRAAVAM (BAHISTU) DWARAA STREELU ENDUKU BAADHAPADATAARU ANEDAANIKI KONTAMANDI, IKKADA CHEPPINA VAATILO KONNITINI KAARANAALUGAA ANU KONTAARU. EE KAARANAALALO EAVI YONI SRAAVAM KALIGISTAAYANI MEERANUKONTUNNARO NENU MIMMALNI ADUGUTUNNAANU Thoddeank dista hin zaun asat kaim karanna bhailanche yonitem vavpak. Tuka dista hantlim khoinchim karanna yonitem vavpak?	Fate 1 (Naseeb) 1 Hanebaraha 1 TALARAATA 1 Noxibak lagun 1 Supernatural causes (jadoo) 2 Maya mantra 2 MANTRA TANTRAALAVALLANA 2 Sonvsarantlea nhoi punn anik vhoodea karanak lagun 2 Foods that you eat for example lassi (Jo khana tum khati ho jaise ki lassi) Tinnuva padartha galinda udaharane lassi 3 MANAM TEESUKONE AAHAARAM VALLA UDAAHARANAKU LASSI TAAGADAM LAANTIVI 3 Tum kitem kata haka lagun dekhik lassi pieun 3 (Interviewer to list the foods she suggests) 3 Excess of heat/cold in the body (Badan mein thand ya garmi hone se) 4 De hada ati heechu sheetadinda 4 SHAREERAMLO EKKUVA VEDI GAANI CHALUVA GAANI CHESTE 4 <i>Angant zaiti gormi vo tonddi asa mhunn 4</i> Emotional factors/tension (Bhavnayein ya mansik thanav) 5 Udvega stitiyinda 5 MANASULO EKKUVAGAA BAADHA LEKA UDUEGAM 5 Bhitorlea bhavnnak lagun/tension vo tokli bejar zaun zodd zata mhunn 5 Infection from customer 6 (Customer se infection hona) 6 <i>Girakigalinda 6</i> KASTAMAR DWAARA ANTU ROGAM VASTE 6 <i>Customera (girieaka) koddlean infection zaun 6</i>		

	<p>[Let her spontaneously answer and then select the most appropriate response]</p>	<p>infection from regular male partner (Niymit/hamesha ke sathi se infection hona) 7 Murd Ninda 7 UNCHUKONNA ATANI DWAARA ANTUROGAM VASTE 7 Sodanchea dadlea sangatea koddlean infection zaun 7 Too many customers (Bahaut jada grahak/customer) 8 Athi hecchina girakigalinda 8 EKKUVAGAA KASTAMARLU VACHCHINANDU VALLA 8 Zaite customer vo girieakeank lagun 8</p> <p>Condom use 9 (condom ka istamal karne se) 9 Condom upayogi suvudarinda 9 NIRODH UPAYOGISTE 9 Condom usar korun vo vaprun 9</p> <p>Not using condoms (condom ka istamal nahi karne se) 10 Condom balasade iruvarinda 10 NIRODH UPAYOGINCHAKAPOTE 10 Condom usar korinam ani vapurnam dekhun 10</p> <p>Normal physiological changes in the body (Badan mein niyमित शारीरिक बदल से)11 Dehada kelavu badalavanegalinda 11 IVI SHAREERAMLO SAHAJA MAARPULE 11 Angant kaim bodlopam zatat haka lagun 11</p> <p>other/ specify (Anyah)12 ITARAALU/VIVARINCHANDI 12 Anik dusrem kiteak lagun/sang 12</p> <p>Don't Know 13 NAAKU TELIYADU 13 Mhaka khobor nam 13</p>	
1223	<p>Who do you feel is most likely to give HIV to you? (Aapke hisab se apko kiski vaja se HIV hone ki jayada sambhavna hai) (Ninna prakara HIV hege ninage barabahudu)? CHAALAAVARAKU EVARIDWAARAA MEEKU HIV RAAVACHCHANI MEERANUKONTUNNAARU Khonna koddlean HIV zaupachi chodd xokkea asa?</p>		
1224	<p>What is your greatest fear or concern about catching HIV? (HIV hone ke bhare mein apke mann mein sabse bada daar ya chinta kya hai)? (HIV baruvudara bagge ninage Iruva dodda hedarike yahudu)?</p>		

DENIDWARA HIV MEEKU RAAVACHCHANI MEERU CHAALAA BHAYAPADUTUNNAARU LEDAA ANUMAANISTUNNAARU		
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HIV zaupachi voddli bhirant kosli?

SECTION B:

Number	Question and filter	Coding Category	Code
<p>Some questions may be personal or embarrassing and you may find them difficult to answer directly. We have therefore provided you to answer these questions in a discrete way without me being able to know what you have answered. For each question I will give you a card. As you can see your name is not on this card only the question number. Here are two padlocked ballot boxes one is marked green for yes and the other is red for no. I will read out the questions and if the answer is yes post the card in the ballot box that is marked green and , if the answer is no please post the card in the ballot box that is marked in red and if you do not know the answer or are unsure please do not post the card at all.</p>			

1301	<p>Have you got a regular male partner: either a boy friend or a husband? (Kya apka koi niyमित/hamesha ka sathi hai - Jaise ke apka boyfriend ya pati/Aadmi)? (Nimage murd / dagad iddara)? EPPUDOO MEETO UNDE MAGAWAADU ANTE BHARTA LEKA MAGA SNEHITUDU (UNCHUKONNA MOGUDU) MEEKU UNNAARAA Tuzo ek sodamcho dadlo sangati asa? Boyfriend vo ghov?</p>	<p>Yes 1 No 2 Not answered 3</p>	
1302	<p>If you have a RMP did you use a condom the last time you had sex with your RMP (Agar apka niyमित sathi hai tho pichli bhar uske sath sambhand ke samay aapne condom ka istamal kiya tha)? (Nimage murd iddara dare avara jothe neevu condom balasuthira)? ALAA EVARAINAA MEEKU UNTE ATANITO KRITAM SAARI SAMBHOGAM (SEX) LO PAALGUNNAPPUDU MEERU NIRODH UPAYOGINCHAARAA Zor tumkam sodancho dadlo sangati asa zalear gel'le nimnem pautti tumi tache lagim condom vaprun sombond dhorla? (Interviewer to inform them they can ignore this question if they do not have a mougulu)</p>	<p>Yes 1 No 2 Not answered 3</p>	
1303	<p>Has anyone ever forced you to have sex with him (i.e made you have sex against your wishes)? (Kya kabhi kisine aapko uske saath sambhand rakhne ke liye jabardasti ki thi)?</p>	<p>Yes 1 No 2</p>	

	<p>(Avara jothe samboga madalu yaradaru balavanta madidhara)? ATANITO SAMBHO GAM (SEX) LO PAALGONAMANI MIMMALNI EVARAINAA BALAVANTAM CHESAARAA? ANTE MEE ISHTAM LEKUNDA A ATANIDAGGARAKU MIMMALNI PAMPAARAA? (Lingik sombond zoddpak tumkam konnen forcar vo tumche khoxe bhair tumkam boll kelam?)</p>	Not answered 3	
1304	<p>Did you use a condom the last time you had sex with a customer? (Pichli baar apne customer ke saath sambhand rakhte ke samay aapne condom ka istamal kiya)?</p> <p>(Kaleda sala girakigala jothe samboga madidaga condomnu balasiddira)? KRITAM SAARI CHIVARI GAA MEE DAGGARAKU VACHCHINA KASTAMARTO SAMBHO GAM (SEX) LO PALGON NAPPUDU MEERU NIRODH UPAYOGINCHAARAA? Gel'le nimne pautt customera lagim lingik sombond dortanam tumi condom vaporlai?</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	
1305	<p>Has a customer ever forced you to have sex without a condom? (Kya kabhi kisi customer ne aapko bina condom ke sambhand rakne ke liye jabardasti ki hai)?</p> <p>(Nimma gira kigalu condom illade sambogakke balavanta madidara)? MIMMALNI E KASTAMARAINAA EPPUDAINAA NIRODH LEKUNDA A SAMBHO GAM (SEX) CHEYAMANI BALAVANTAM CHESHAA RAA? Tumche lagim customeran kednam condom nastanam lingik sombond dhorla?</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	
1306	<p>Have you ever had sex with a customer without a condom because he offered you more money? (Kya aapne kabhi jada paise dhene wale customer ke saath bina condom ka sambhand rakha hai)?</p> <p>(Heechu hana koduthananta condom balasade samboga mididdira)?</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	

	<p>OKA KASTAMAR DABBULU EKKUVAGAA ICHAADANI ATANITO NIRODH LEKUNDA MEEREPPUDAINAA SAMBHOOGAM (SEX) CHESHAARAA</p> <p>Tumi customera lagim lingk sombond condom nastanam dhorla kiteak tannim tumkam chodd poixe dileat mhunn?</p>		
1307	<p>Have you had a condom break or slippage in the past week? (Pichle hafte mein kya aapka condom tutha ya fisal gaya tha)?</p> <p>(Yavatadaru condom haridu hogideva)?</p> <p>GATA VAARAMLO MEEKEPPUDAINAA NIRODH PAGILI POVADAM GAANI JAARIPOVADAM GAANI JARI GINDAA</p> <p>Gellea sumanant tumcho condom kednam futla vo slip zala?</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 4</p>	
1308	<p>Have you ever had an abortion? ? (Kya aapne kabhi paat saaf karaya hai)</p> <p>(Yavathadaru garbha patha madisiddira)?</p> <p>MEEKEPPUDAINAA GARBHA SRAAVAM (KADUPU POVADAM) JARIGINDAA?</p> <p>Tumi kednam gorvpat kela?</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	
1309	<p>Do you drink alcohol? (Kya aap Sharaab piti hai)</p> <p>(Neevu sharabu kudyuthira)?</p> <p>MEEKU MATTUPAANEEYAALU (MANDU) TAAGE ALAVAATUNDAA</p> <p>Tumi soro pietat?</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	
1310	<p>Have you ever been sexually abused or raped by a member of your own family e.g. father, uncle, or brother? (Kya kabhi apke ghar ke vyakti ne jaise ke Pita, Mama/Chacha ya bhai ne apko jabardasti ki ya aapka balatkar kiya hai)?</p> <p>(Nimage kutumbada yaradaru sadasyaru balavanthadinda laingika kirukula athava rape madiddara)?</p> <p>MEE KUTUMBA SABHYULLO EVARAINAA MIMMALNI BALAATKAARAM CHEYADAM GAANI, BALAVANTAMGAA ANUBHAVINCHADAM GAANEE CHE SHAARAA? UDAAHARANAKU, TANDRI, BAABAAYI, ANNA, TAMMUDU.</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	

	Tumchea ghorantlea vangddean zaun pain, unclean vo bhavan tumche lagim lingik sombond dhorla vo bolatkar kela?		
1311	<p>Are there any questions in this questionnaire that you did not answer truthfully? (Kya prashnotri ke kisi prashna ka aapne galat jawab diya hai)?</p> <p>(yilliruva prashnegalige neevu pramanikavagi uttarisiddira)?</p> <p>E PRASHNAAPATRAMLO MEERU MANASPOORTIGAA JAWAABUIVVANI PRASHNALU EVAINAA UNAAAYAA</p> <p>(Ami vicharilem khoinceach proxnak tumi fot marlea vo sot zobab diunk nam?)</p>	<p>Yes 1</p> <p>No 2</p> <p>Not answered 3</p>	

Form to be completed for all Seeds/Participant:

Date -----/----/ 200
Seed number -----
Interviewer ID number -----
Name or other identification: -----
Sex (circle as appropriate) Male Female
Age -----
Ethnicity/ language -----
Site recruited -----
Role (circle as appropriate) Garawali Pimp Pilot Lodge
 Panwallah Other/specify -----

Reason recruited-----

Network Size -----

Study number if applicable 2.....

Number of coupons given (circle) 1 2 3

12.3 Informed consent

VULNERABLE WOMEN IN GOA: AN HIV PREVENTION STUDY

Information sheet 1

(In case of low literacy to be read out to the participant in the presence of a witness)

Structured interview and sample collection for the vulnerable women

We are asking you to be involved in a research study to help us find ways to prevent HIV spread in Goa and to improve the health services to treat reproductive tract infections. Before you take part it is important to understand why this work is being done. Please take the time to listen to the following information and discuss it with others if you wish. Please ask us if anything is unclear or you have any concerns. Take time to decide if you would like to take part or not

What is the purpose of the study?

HIV has been spreading across India over the past ten years. Women who are involved in the commercial sex trade are particularly vulnerable to this infection. Increased condom use, improved treatment of sexually transmitted infections and empowerment of women can all help to prevent the spread of HIV. The recent changes in circumstances may impact on the provision of these services and have an effect on women's health. The aim of this study is to examine the effect of the recent events on women's health and to use the information to tailor and enhance HIV prevention services to the sex workers to make sure they remain relevant and appropriate.

Why have I been chosen?

We have asked women who have already participated in the study to introduce three other women who may be vulnerable to HIV to participate in our study. The recruitment to the study will start from November 2004.

Do I have to take part in the study?

It is up to you whether or not you take part. If you decide to take part you will be given this information sheet to keep and a consent form to sign or mark in front of a witness. You will also be given a copy of the consent form. In case you decide to take part, you have the right to withdraw at any time without giving a reason. The decision to withdraw at any time, or not to take part at all will not affect the services you receive.

There are two components to the study

The first component involves an interview with a qualified interviewer. The interview will be about you, your experiences and thoughts about HIV, sexually transmitted infections, reproductive health, health care services, your emotions and your work. Some of the questions will be about your sexual behaviour with your paying and non-paying clients. We anticipate that the interviews will take 60 minutes. They will be conducted in privacy and you can refuse to answer questions that make you uncomfortable. The interview will be conducted in the language of your choice.

The second component involves pricking your finger and taking five spots of blood onto a piece of paper. This will be used to test for syphilis, herpes simplex and HIV infection. We will also ask you to give us vaginal swabs that we will ask you to take yourself from your vagina to test for sexually transmitted infections. The results of all these tests will be anonymous and no one will be able to trace the results back to you. If you want to test for HIV we can refer you to a counsellor and arrange for a discussion and an HIV test. Since the results of the swabs take a few months, we will offer you some antibiotics, which treat all the common reproductive tract infections. The antibiotics are azithromycin, and cefixime. You take all the tablets at the same time. If you have vaginal discharge we will also offer you tinidazole. It is better to take this tablet after food and before you go to bed at night. This may give you a metallic taste in your mouth and you may feel nauseous for over 24 hours. You must avoid alcohol for 48 hours or you may vomit. During the study time if you ever have any reproductive tract symptoms we will offer you free treatment through a voucher system. Your husband, boy friend or other sexual partners can also get free STI treatment through the same voucher system.

Will my taking part in the study be kept confidential?

Yes. All information will be kept strictly confidential and anonymous. We will remove all identifying data like your name or address from the questionnaires and samples and so you will not be recognised. We will keep all the data under lock and key in a safe place. We realise that many of the questions are personal but your help will allow us to understand how your work practices affect your health and will enable us to improve your HIV prevention and reproductive tract infection treatment in the future.

What will happen to the results of the study?

The overall results of the study, but NOT OF INDIVIDUAL PARTICIPANTS will be shared with all the study participants, sex workers, NGOs, health care workers working with them and the ministry of health. The results will be used to identify the health care and other needs of vulnerable women and find ways to improve the provision of HIV prevention and care services to women as well as to provide treatment for reproductive tract infections in the future.

How will I benefit from participating in the study?

The most important benefit for you will be that we will provide you and your peers with information about how you can protect yourself against HIV infection as well as free supply of condoms. We will be providing you and your partner with treatment for sexually transmitted infections and if you would like we can arrange for you to have voluntary counselling and testing for HIV.

The interview and sample-taking will take up some of your time. We will also ask you to recommend three other women at risk of HIV to participate in our study. We will therefore reimburse you for your travel and offer you 100 Rupees as compensation for the time spent during the interview and sample taking and 30 Rupees compensation for the time spent disseminating HIV prevention material and asking each woman to participate in this study.

Who is organising and funding the research?

The Wellcome Trust through a training fellowship grant funds the research. Dr Maryam Shahmanesh is the person organising the study and is responsible for all the data. Positive People is coordinating the fieldwork. Both the independent ethics committee-India based in Mumbai and the ethical committee of University College London have given ethical approval for this study.

Contacts for further information:

Dr Maryam Shahmanesh or Ms Sonali W.

F-1, Soares Enclave, Above Basilios Health Club, St. Inez, Panaji, Goa 403001

Phone no: 2425404 (office)/ 9822176495 (Dr Maryam)/ 9822586289 (Sonali)

VULNERABLE WOMEN IN GOA: AN HIV PREVENTION STUDY

CONSENT FORM-1

Structured interview and sample collection from the vulnerable women

Researchers: Dr Maryam Shahmanesh
Dr Vikram Patel
Dr Frances Cowan
Professor David Mabey

I confirm that I have read/heard and understand the information sheet for the above study and have had the opportunity to ask questions

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without my medical or legal rights being affected.

I understand that all the information I provide will be kept confidential and anonymous.

I agree to take part in (TICK ALL THAT CONSENT TO)

1. An interviewer administered structured interview about the nature of my work and my perceptions and knowledge about HIV and sexually transmitted infections, the health care provision for these infections, and my emotional health.
2. To take vaginal samples from myself to test for reproductive tract infections
3. To have blood spots taken from a finger prick to test for HIV, syphilis and herpes infections

Name of participant	date	signature or mark
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Name of witness (in case of low literacy)	date	signature or mark
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Name of person taking consent	date	signature or mark
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(2 copies: 1 for patient, 1 for researcher and 1 for positive people)

VULNERABLE WOMEN IN GOA: AN HIV PREVENTION STUDY
Information sheet 2
(In case of low literacy to be read to the participant in the presence of a witness)

Key informant interview

We are asking you to be involved in a research study to help us find ways to prevent HIV spread in Goa and to improve the health services to treat reproductive tract infections. Before you take part it is important to understand why this work is being done. Please take the time to listen to the following information and discuss it with others if you wish. Please ask us if anything is unclear or you have any concerns. Take time to decide if you would like to take part or not.

What is the purpose of the study?

HIV has been spreading across India over the past ten years. Women who are involved in the commercial sex trade are particularly vulnerable to this infection. We know that the HIV virus is infecting some of these vulnerable women in Goa. Increased condom use, improved treatment of sexually transmitted infections and empowerment of women can all help to prevent the spread of HIV. The recent changes in circumstances may impact on the provision of these services and have an effect on women's health. The aim of this study is to examine the effect of the recent events on women's health, to understand and map how sex work is reorganising in the aftermath of the Baina demolitions in order to adapt and enhance HIV prevention services to the sex workers to make sure they remain relevant and appropriate.

Why have I been chosen?

You have been identified as someone, who through their social contacts and position in society, will be able to give us information that will help us attain our objectives.

Do I have to take part?

It is up to you whether or not you take part. If you decide to take part you will be given this information sheet to keep and a consent form to sign or mark in front of a witness. You will also be given a copy of the consent form to keep. If you decide to take part you are free to withdraw at any time and without giving a reason. The decision to withdraw at any time, or not to take part at all will not affect the standard of care you receive.

There is one component to the study

The study will involve an in depth interview with a qualified interviewer. The interview will be about your knowledge and expertise regarding the evolving nature of sex work; the social, emotional and health needs of the sex workers; the mobility and vulnerability of the sex workers to violence; their access to HIV prevention services including condoms and treatment of sexually transmitted infections; and any factors that may be effecting their vulnerability of the sex workers to HIV, sexually transmitted infections or pregnancy. We anticipate that the interviews will take 1.5-2

hours. They will be conducted in privacy and you can refuse to answer questions that make you uncomfortable. The interview will be conducted in the language of your choice.

Will my taking part in the study be kept confidential?

Yes. All information will be kept strictly confidential and anonymous. We will remove all identifying data like your name or address from the data so you will not be recognised. We will keep all the data under lock and key in a safe place. We realise that many of the questions are sensitive but with your help we will be able to document the changing nature of sex work and thus be able to provide improved the HIV prevention and reproductive tract infection treatment to a greater proportion of vulnerable women throughout Goa.

What will happen to the results of the study?

The overall results of the study, but NOT OF INDIVIDUAL PARTICIPANTS will be shared with all the study participants, sex workers, the NGOs and health care workers working with them and the ministry of health. The effect of the recent events on women's health and health seeking behaviour will be described to all the stakeholders and in cooperation with them it will be used to try and find a way to continue to reduce HIV and treat reproductive tract infections in the future.

Who is organising and funding the research?

The Wellcome Trust through a training fellowship grant funds the research. Dr Maryam Shahmanesh is organising the study and is responsible for all the data. Positive People is coordinating the fieldwork. Both the independent ethics committee-India based in Mumbai and the ethical committee of University College London have given ethical approval for this study.

Contacts for further information:

Dr Maryam Shahmanesh or Ms Sonali W.

F-1, Soares Enclave, Above Basilio's Health Club, St. Inez, Panaji, Goa 403001

Phone no: 2425404 (office)

9822176495 (Dr Maryam)

9822586289 (Sonali)

VULNERABLE WOMEN IN GOA: AN HIV PREVENTION STUDY

CONSENT FORM-2

Key Informant Interviews

Researchers: Dr Maryam Shahmanesh
Dr Vikram Patel
Dr Frances Cowan
Professor David Mabey

I confirm that I have read/heard and understand the information sheet for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without my medical or legal rights being affected.

I understand that all the information I provide will be kept confidential and anonymous.

I agree to take part in (TICK ALL THAT CONSENT TO)

An interviewer administered in-depth interview regarding the evolving nature of sex work in Goa including information of how, where and with whom sex work is occurring and how is this changing; the social, emotional and health care needs of sex workers; the mobility and vulnerability of the sex workers to violence; their access to HIV prevention services; and any factors that may be effecting their vulnerability to HIV, sexually transmitted infections and unwanted pregnancy.

I agree to have the interview taped

Name of participant	date	signature or mark
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Name of witness (in case of low literacy)	date	signature or mark
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Name of person taking consent	date	signature or mark
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(2 copies: 1 for patient, 1 for researcher and 1 for positive people)

VULNERABLE WOMEN IN GOA: AN HIV PREVENTION STUDY
Information sheet 3

(In case of low literacy to be read to the participant in the presence of a witness)

In depth Interviews

We are asking you to be involved in a research study to help us find ways to prevent HIV spread among vulnerable women and to improve the health services to treat reproductive tract infections. Before you take part it is important to understand why this work is being done. Please take the time to listen to the following information and discuss it with others if you wish. Please ask us if anything is unclear or you have any concerns. Take time to decide if you would like to take part or not.

What is the purpose of the study?

HIV has been spreading across India over the past ten years. Women who are involved in the commercial sex trade are particularly vulnerable to this infection. We know that the HIV virus is infecting some of these vulnerable women in Goa. Increased condom use, improved treatment of sexually transmitted infections and empowerment of women can all help to prevent the spread of HIV. The recent changes in circumstances may impact on the provision of these services and have an effect on women's health. The aim of this study is to examine the effect of the recent events on women's health and to use the information to tailor and enhance HIV prevention services to the sex workers to make sure they remain relevant and appropriate.

Why have I been chosen?

You have been introduced to us as someone whose life experience may be able to help us examine some of the effects of recent events on the health of vulnerable women.

Do I have to take part?

It is up to you whether or not you take part. If you decide to take part you will be given this information sheet to keep and a consent form to sign or mark in front of a witness. You will also be given a copy of the consent form to keep. If you decide to take part you are free to withdraw at any time and without giving a reason. The decision to withdraw at any time, or not to take part at all will not affect the standard of care you receive.

There is one component to the study

The study involves an interview with a qualified interviewer. The interview will be about you, the nature of your current work and any recent changes you may have experienced; any dangers, violence and risks you face in your daily life; your current physical, emotional and social circumstances; your experiences and thoughts about HIV, reproductive tract infections; and your ability to protect yourself against these infections; contraception, pregnancy including unwanted pregnancy; your life

experiences, your relationships, and your hopes and dreams for the future. We anticipate that the interviews will take 2-3 hours. They will be conducted in privacy and you can refuse to answer questions that make you uncomfortable. The interview will be conducted in the language of your choice.

If you need any information or help regarding HIV or other sexually transmitted infections, if you need to see a doctor regarding any health concerns that you may have or if you would like to be tested for HIV we will help to arrange these free of charge for you. We can also arrange for a regular supply of condoms to help protect you against HIV, other sexually transmitted infections and pregnancy. During the study time if you ever have any reproductive tract symptoms we will offer you free treatment through a voucher system. Your husband, boy friend or other sexual partners can also get free STI treatment through the same voucher system.

Will my taking part in the study be kept confidential?

Yes. All information will be kept strictly confidential and anonymous. We will remove all identifying data like your name or address from the data so you will not be recognised. We will keep all the data under lock and key in a safe place. We realise that many of the questions are personal but your help will allow us to document the effects of recent events on your health and be able to improve HIV prevention and reproductive tract infection treatment in the future.

How will I benefit from participating in the study?

The most important benefit for you will be that we will provide you and your peers with information about how you can protect yourself against HIV infection as well as free supply of condoms. We can provide you and your partner with treatment for sexually transmitted infections and if you would like we can arrange for you to have voluntary counselling and testing for HIV. We will reimburse you for your travel and offer you Rs 100 as compensation for the time spent during the interview.

What will happen to the results of the study?

The overall results of the study, but NOT OF INDIVIDUAL PARTICIPANTS will be shared with all the study participants, sex workers, the NGOs and health care workers working with them and the ministry of health. The effect of the eviction order on women's health and health seeking behaviour will be described to all the stakeholders and in cooperation with them it will be used to try and find a way to continue to reduce HIV and treat reproductive tract infections in the future.

Who is organising and funding the research?

The Wellcome Trust through a training fellowship grant funds the research. Dr Maryam Shahmanesh is organising the study and is responsible for all the data. Positive People is coordinating the fieldwork. Both the independent ethics committee-India based in Mumbai and the ethical committee of University College London have given ethical approval for this study.

Contacts for further information:

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12.4 Standard Operating Procedures and forms

Several standard operating procedures governed the study procedures
They are available from the author on request

1. Standard operating procedure for study phase 3
 - a. Procedure for questionnaire
 - b. Procedure for the storage of documentation in the office
 - c. Procedure for sample registration and transportation
2. SOPs for biological sample collection, registration, storage and transportation
3. SOPs on informed consent procedures
4. SOPs on form management and study documentation
5. SOP on data management and quality assurance/ quality control
6. SOP on quality control
7. SOP on safety procedures
8. SOP for presumptive treatment of STIs

There were also a variety of forms designed for the study

1. STI treatment form for field researchers
2. STI treatment form for doctors
3. Seed form
4. Referral form
5. Link-log form
6. Participant refusal forms
7. RDS coupons
8. RDS payment vouchers
9. Delivery note
10. Resampling form
11. STI results form

12.5 Information education communication

These are just a few examples of the IEC material that was developed following the dissemination. The leaflets are in Hindi, Kannada and Konkani. Due to low levels of literacy they are primarily pictorial.

Figure 12-1 HIV treatment with antiretroviral drugs (outside of leaflet)




Figure 12-4 STI and HIV leaflets (back cover)

Sodam condom usar kor ani STD rog- am koddlo pois rav.
हमेशा कोन्डॉम का इस्तेमाल करे और गुप्त रोग से दुर रहे !
ನಿರೋಧ ಬಳಸಿ ಗುಪ್ತರೋಗದಿಂದ ದೂರವಿರಿ

Positive People, 1st Floor, Maithili Apts, St. Inez, Panjim Goa.403001.
Ph.: (0832) 2431827, 2424396.
ಪೊಜಿಟಿವ್ ಪಿಪಲ್, ಪಹಲಿ ಮನ್ಜಿಲ್, ಮೈಥಿಲಿ ಅಪಾರ್ಟ್‌ಮೆಂಟ್ಸ್, ಸಾನ್ತ ಇನೆಜ್, ಪಣಜಿ - ಗೋವಾ.
ಫೋನ್ : ೦೮೩೨ - ೨೪೩೧೮೨೭, ೨೪೨೪೩೯೬
ಪಾಸಿಟಿವ್ ಪೀಪಲ್ 1 ನೇ ಮಳಿಗೆ ಮೈಥಿಲಿ ಕಟ್ಟಡ ಸಂತ ಇನಿಸ ಪಣಜಿ ಗೋವಾ

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Sorkari Goa Medical College-cha
Hospital-ant Bambolim,HIV- ik funkot treatment mellta
सरकारी हस्पताल में इसका ईलाज मुफ्त
किया जाता है।
ಎಚ್.ಆರ್.ವೀಯ ಮದ್ದು ಬಾಂಬೊಲಿಯ
ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಉಚಿತವಾಗಿ ಸಿಗುತ್ತದೆ

Positive People, 1st Floor, Maithili Apts, St. Inez,
Panjim Goa.403001. Ph.: (0832) 2431827, 2424396.
ಪೊಜಿಟಿವ್ ಪಿಪಲ್, ಪಹಲಿ ಮನ್ಜಿಲ್, ಮೈಥಿಲಿ ಅಪಾರ್ಟ್‌ಮೆಂಟ್ಸ್, ಸಾನ್ತ ಇನೆಜ್,
ಪಣಜಿ - ಗೋವಾ. ಫೋನ್ : ೦೮೩೨ - ೨೪೩೧೮೨೭, ೨೪೨೪೩೯೬
ಪಾಸಿಟಿವ್ ಪೀಪಲ್ 1 ನೇ ಮಳಿಗೆ ಮೈಥಿಲಿ ಕಟ್ಟಡ
ಸಂತ ಇನಿಸ ಪಣಜಿ ಗೋವಾ

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Figure 12-5 STI and HIV leaflets (an example of inside pages)

एच.आई.वि. व्यक्ति के शरीर की प्रतीकार शक्ती, एच.आई.वि. दवाईयों लेने के बाद बढ़ता है। एच.आई.वि. व्यक्ति इसका इलाज कराया तो उसे अच्छा लगेगा और अपनी जिन्दगी और सेहत को लम्बे समय तक जी सकते है।

ಎಚ್.ಆಯ್.ವಿ. ಇರುವ ಮನುಷ್ಯನ ರೋಗ ನಿರೋಧಕ ಶಕ್ತಿಯು ಬೆಕ್ಕತೆಗೆದುಕೊಂಡ ಮೇಲೆ ಹೆಚ್ಚಾಗುತ್ತದೆ ಎಚ್.ಆಯ್.ವಿ ಇರುವ ವ್ಯಕ್ತಿಯು ಬೆಕ್ಕತೆಗೆದುಕೊಂಡರೆ ಸರಿಯಾಗುತ್ತಾನೆ ಮತ್ತು ಅವನು ಒಳ್ಳೆಯ ಆರೋಗ್ಯಕರ ಜೀವನವನ್ನು ನಡೆಸಬಹುದು.

Amchea rogtant xipai(soldad) astat, bailea kosleai infectionacher te zogoddat.HIV sovkas heam xipiank kabar korta.

कुछ सैनिक हमारे खून में होते हैं, जो हमारे इन्फेक्शन के बाहर रहकर उसके खिलाफ लड़ता हैं।

ನಮ್ಮ ಜೀವದೊಳಗೆ(ಆಂದರೆ, ರಕ್ತದಲ್ಲಿ) ಕೆಲವು ಸೈನಿಕರುತ್ತಾರೆ. ಅವು ನಮಗೆ ಹೊರಗಿನಿಂದ ಬರುವ ರೋಗಗಳಿಂದ ರಕ್ಷಿಸುತ್ತವೆ. ಆದರೆ ಎಚ್.ಆಯ್.ವಿ. ಯು ಈ ಸೈನಿಕರನ್ನು ನಾಶ ಮಾಡುತ್ತದೆ

2

Tumcho dogaimcho treatment khabar zai porian, tujea sodanchea dadlea sangatea barabor condom usar kor.

आपके पति के साथ कोन्डोम का इस्तेमाल करे जब तक दोनो का पुरि तरह से इलाज नहि हो जाता !

ಸಂಗಾತಿಯು ಬೆಕ್ಕತೆ ಮುಗಿಯುವವರೆಗೆ ಸಂಬೋಗ ಮಾಡುವಾಗ ನಿರೋಧಕ ಹಾಕಬೇಕು

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