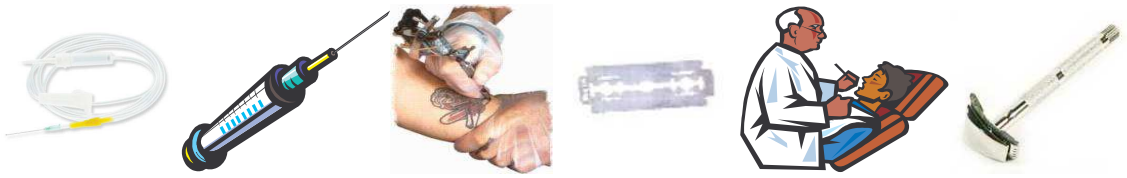

# HIV from blood exposures in India

# - an exploratory study

**Mariette Correa and David Gisselquist**

**Supported by**

NORWEGIAN CHURCH AID

**Regional Representation South Asia**

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NCA South Asia, Colombo
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# Foreword

AIDS is still a relatively small problem in South Asia, but a big, huge risk.

The potential of a pandemic that hits the Indian society like it has hit parts of Africa, would be a horrendous catastrophe, a plague that would hurt India for generations. It took Europe 200-300 years to regenerate after the Black Plague in the 14th century.

But we can stop it. Africa has taken the first hit; South Asia can learn and do the needful to limit the spread of the virus. So many cases are already reported in India that it is taken seriously both here and in the international community. The UN, Global Fund, foundations and international NGOs are already in full swing. Even more the national institutions.

Norwegian Church Aid (NCA), the biggest international humanitarian organisation in Norway, is a small player in the HIV/AIDS field in South Asia, but we are here, and we are doing projects with partner organisations in several parts of India, Bangladesh and Nepal. With good connections to the church networks, NCA has tried to facilitate HIV/AIDS work with religious leaders and congregations. And in many places the response is good. Maybe too good.

What if we are wrong about the way HIV spreads through different routes; could that be possible?

It was NCA's advisor on HIV/AIDS for several years now, Dr. Mariette Correa, who brought this suspicion up with me last year. The biomedical facts are that the virus transmits many hundreds times faster through blood than through semen, so why is the sexual route totally dominating our work, and the blood route mostly neglected, especially in a country where unsterile health care is so common?

If we are wrong, and not addressing all the ways in which HIV is spreading, that would be disastrous.

We decided to organize a small research project, to find out more. We had no ambitions to prove anything conclusive. I am personally very sceptical of 'evidence' in matters relating to society, and epidemic diseases do relate to society. The best we can do is to act on the best knowledge we can produce. But in the HIV/AIDS field, solid knowledge seems hard to get.

The content of the study will be displayed on the following pages. As I see it, the study states some questions and doubts about the present hegemonic understanding of HIV/AIDS in India. These questions and doubts are supported by some qualitative investigations in four states in India, Goa, Maharashtra, Karnataka and Tamil Nadu. It is our aim to make this relevant to our own work; we challenge others.

But it seems difficult to get attention to the potential of blood transmission. And that is in many ways understandable. The sexual route is a very convenient one; it places the full responsibility on the HIV-positive person, or someone close to him or her. It makes it to a large extent a moral issue. Either the HIV-positive person has got the virus from acting irresponsible, or the partner has. That is very convenient for society.

When the blood route is addressed it is related to IV drug users, a totally marginal group. This is a well-known phenomenon from the very start of the HIV pandemic. Paul Farmer describes from the first years in the USA how CDC identified risk groups to be men who have sex with men, intravenous drug users, hemophiliacs, and people from Haiti. They believed that it had originated in Haiti and stigmatised a whole national group.

But we think it is important to examine the contributions of blood exposures and the state's responsibility to the epidemic.

By looking closer at the surveillance system the study points to great weaknesses, indicating the possibility that we actually can be less sure, not only about the estimated number, but also about the recorded cause of infection. By looking closer at unexplained cases, the possibility for alternative explanations is made even stronger.

If we do not address blood exposures and correct the ways we get data on transmission routes, it not only lets the virus slip through a loophole, it can reduce the effect of all the other work. If the health services are not safe, then the virus will spread over time regardless of the density of condoms.

We realize that it is a risk also to point to unsafe health practices, if we do not make serious attempts to change them. That can be done once the problem is recognised.

Norwegian Church Aid has financed the study, and will take it to practice. But we offer it to all our partners in the fight against AIDS, to make use of it.

Dr. Mariette Correa formulated the project and has led the work. I want to thank her for her very skilled and energetic contribution. I also want to thank Dr. David Gisselquist for his expertise, active involvement in and contribution to the study. I will also on behalf of NCA thank all those who have contributed with their time and knowledge, either directly as part of the project or as resource persons and informants.

Hans Einar Hem
Regional Representative
NCA South Asia

## Acknowledgements

It is only due to the cooperation and enthusiasm of so many people who helped us at various points of time during this last year that we were able to conduct this study. We would first like to thank the people living with HIV and AIDS who allowed us to interview them, sharing their experiences and often mirroring our concerns about non-sexual HIV transmission. We thank the organizations and individuals in each district who helped us to contact their members or patients, including Amhich Amche and Aastha in Sangli, Spandana and Dr. Sivaram in Belgaum, Asro in Goa and WORD in Namakkal. We are grateful to the many health care providers in the districts who spent time to talk with us and to show us their facilities. We appreciate the openness with which we were received by institutions and individuals, including hospitals, HIV counsellors, blood banks, pharmacists, wholesalers, and others. We are grateful to staff of the SACS for explaining their programmes, and for providing data and reports.

We are grateful to those who provided advice on methods and issues at the start of the study, especially Dr. S.N. Misra, Rajeev Sadanand, Dr. P Salil, Dr. D C S Reddy, Dr. Savio Rodrigues, Dr. B M Ramesh, Steve Minkin, Dr. Tanu Singhal, Garance Upham, and Dr. Yvan Hutin. Thanks to Roberta Bensky for helping us to assemble background papers as we began this study. We thank Dr. N. K. Arora for advice and perspectives on infection control in health care. We thank Supriya Arolkar for her insights into risk assessment practices. We appreciate Mary Sage's advice on the cover design.

We thank Dr. Alka Gogate, Dr. Geeta Mehta, Pardeep Sareen, Dr. Satish Kaipilyawar, Dr. D C S Reddy, Garance Upham, Dr. Devashish Dutta, and Santosh Iype for reviewing our findings during a two-day workshop in October 2005; we have incorporated their comments throughout the report and especially in the recommendations in Chapter 8.

We are indebted to Norwegian Church Aid, South Asia for support. We especially thank Hans Einar Hem, the regional representative, for early and continuing commitment to this study, and for his supportive interaction and advice throughout. We would also like to thank Norwegian Church Aid, Oslo and the HIV/AIDS regional coordinators for their support on the issue and their feedback during the early months of the study. Many thanks also to Norwegian Church Aid's partner organizations in South Asia, who shared their experiences and who have also responded to the concerns expressed in this study.

We cannot thank the research team enough for their efforts during data collection and beyond. They worked largely independently and under difficult circumstances. We are particularly thankful for their commitment and involvement in the issue which has gone far beyond the requirements of their jobs.

Finally, we appreciate the support and forbearance of our spouses and children, who put up with our sporadic absences and continuing obsessions for more than a year.

# Table of contents

## Abbreviations and acronyms

| | |
|---|---|
| AD | auto-disable |
| AIDS | acquired immunodeficiency syndrome |
| AIIMS | All India Institute of Medical Science |
| ANC | antenatal care |
| APAC | AIDS Prevention and Control Programme |
| CSW | commercial sex worker |
| ENT | ear nose throat |
| FSW | female sex workers |
| GSACS | Goa State AIDS Control Society |
| HIV | human immunodeficiency virus |
| IAP | Indian Academy of Pediatrics |
| IDA | Indian Dental Association |
| IDU | intravenous drug use |
| IEC | information, education, communication |
| IMA | Indian Medical Association |
| IV | intravenous |
| ICHAP | India-Canada Collaborative HIV/AIDS Project |
| ICMR | Indian Council of Medical Research |
| KLES | Karnataka Lingayat Education Society |
| KSAPS | Karnataka State AIDS Prevention Society |
| MSACS | Maharashtra State AIDS Control Society |
| MSM | men who have sex with men |
| MTP | medical termination of pregnancy |
| NACO | National AIDS Control Organisation |
| PAF | population attributable fraction |
| PID | pelvic inflammatory disease |
| PLWHA | people living with HIV/AIDS |
| PPTCT | Prevention of Parent to Child Transmission |
| PSM | Preventive and Social Medicine |
| PWA | people with AIDS |
| RMP | Registered Medical Practitioners |
| SACS | State AIDS Control Society |
| STD | sexually transmitted disease |
| STI | sexually transmitted infections |
| TANSACS | Tamil Nadu State AIDS Control Society |
| VCCTC | Voluntary Confidential Counselling and Testing Centre |

# Introduction

Almost two decades after HIV was first detected in India, much of what is happening remains a mystery. Virtually everyone agrees that sexual transmission contributes to India's epidemic. However, that insight is not enough. No one in the National AIDS Control Organization (NACO), UNAIDS, WHO, or any other major organization dealing with HIV/AIDS in India has been able to adequately explain why people in many rural districts in the south are ten times more likely to be infected with HIV than are urban or rural residents in many northern states. Nor can they explain why sex workers are many times more likely to be HIV-positive if they work in Mumbai or Goa rather than in Chennai or Kolkata.

These are serious failures, because if experts cannot explain why some districts and sex workers have much higher rates of HIV infection than others, they may well not know what is required to stop and to roll back HIV epidemics. Apparently, something is missing in official explanations of India's HIV epidemics.

One candidate for this missing factor – there may be others – is HIV transmission through unsterile health care and cosmetic services. Virtually everyone associated with health care in India acknowledges that unsterile practices are common in both the public and private sectors. India's increasing reliance on an unregulated private health care sector extends low cost unsafe care to poor people.

Even so, managers of HIV prevention programmes have all but ignored the risk that this presents for HIV transmission. Lack of alarm about unsterile health care is excused by arguments that there is no evidence linking health care to HIV infection (which is not true; see Chapter 1). In addition, many HIV experts warn that public messages about HIV risks in health care might detract from safe sex messages and drive people away from health care.

The lack of alarm about unsterile health care and cosmetic services in India contrasts sharply with what happened in developed countries. Shortly after the cause of AIDS was recognized as a bloodborne virus in the early 1980s, health care managers – responding to public pressure – cleaned up health care systems to protect patients and staff. Similar programmes are required to protect patients in India, and they may also be necessary to reverse India's HIV epidemic.

However, two obstacles to implementing such programmes in India are a lack of information about blood exposures, and acceptance of NACO's estimates that sex accounts for almost all HIV infections. Accordingly, the two main objectives of this study have been: (a) to explore the contribution of blood exposures to India's HIV epidemic, and (b) to assess the reliability of NACO's estimates on proportions of HIV infections from various risks.

We came to this study from different backgrounds. One of us (MC) has been involved in HIV/AIDS programming for NGOs in Goa and later South Asia, while the other (DG) has researched blood exposures as risks for HIV in Africa. Before we began this study in 2004, we knew that many people were already working on injection safety for HIV prevention in India. We also knew of excellent studies on injection practices, and two models attributing 3.3% to 24% of HIV infections in India to unsafe medical injections (see Chapter 1).

However, some things were missing. For one, most studies that discussed medical injections neglected other common blood exposures in health care and cosmetic services. Moreover, no one was examining the foundations of NACO's influential estimates that sex accounts for 86 percent of HIV infections, and that blood exposures other than transfusion of contaminated blood and injection drug use account for an insignificant number of infections.

During our literature review, we were surprised to find that available evidence from studies in India shows an important proportion of HIV infections from blood exposures, and simply does not agree with official theories of India's HIV epidemic (Chapter 1).

We focused our field research on four southern districts with high levels of HIV infection in the general population. Chapter 2 describes our methods. In these four districts, we interviewed HIV-positive people about their exposures as well as their experiences during counselling (Chapter 3). We found children with HIV-negative mothers as well as HIV-infected men and women who denied sexual exposures to HIV (Chapter 4), and we identified unsafe practices during health care and cosmetic services (Chapter 5). We found evidence that female sex workers and other vulnerable groups have more – and more dangerous – invasive health care and cosmetic procedures than do people in the general population (Chapter 6).

We examined NACO's AIDS case surveillance system, from doctors assessing routes of transmission through hospital reports to SACS and onward reports to NACO. We found structural and procedural weaknesses that contribute to unreliable estimates of the proportions of HIV from various routes of transmission (Chapter 7).

Chapter 8 summarizes our conclusions, suggests more research, and recommends interventions to reduce HIV transmission. We also suggest specific changes in NACO's AIDS case reporting formats and system to improve the reliability of NACO's estimates of the proportions of HIV infections from various routes of transmission.

We hope that this report will help to reduce personal risk to acquire HIV during health care and to reverse HIV epidemic expansion in India.

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# Chapter 1
# Background

In the years that HIV has been circulating in India, the number of people living with HIV has doubled more than 22 times from 1 some years before 1986 to an estimated 5.1 million in 2005, including 0.9 percent of the adult population and 55,000 children. According to recent estimates from the National AIDS Control Organization (NACO),[1] the annual rate of increase in numbers of HIV infections fell to less than 1 percent in 2003-04. However, these estimates come with a wide margin of error. Furthermore, although aggregate trends are encouraging, some of the details are worrisome. Epidemics in several southern and eastern states are among the worst in Asia – Andhra Pradesh, for example, has a higher estimated adult HIV prevalence[2] than any country in Asia, and more people living with HIV than any Asian country except China.

HIV prevalence is currently higher in rural than in urban India. For example, a 2003 survey found 2.9 percent of the general population infected in Bagalkot District of Karnataka,[3] only slightly less than the 4.0 percent reported among female sex workers (FSWs) in Chennai in 2004.[4] Across India, recognized high-risk groups account for only a small minority of HIV infections. The estimated 71,000 FSWs living with HIV[5] are only 1.4 percent of HIV infections in India. Injection drug users (IDU) account for an estimated 2.4 percent of infections. There is no separate estimate for men who have sex with men (MSM).

**Why it is useful to know more about HIV transmission through blood exposures**

HIV risk is a two-way street: Infections can come from sexual contacts and from blood exposures. Knowing the proportions of HIV coming from each direction as well as the specific blood exposures that are responsible – e.g., medical injections, dental care – is useful not only to advise people how to avoid HIV infection but also to develop more effective programmes to slow epidemic growth.

Furthermore, good information on routes of transmission is required to make reliable projections about the trajectory of the epidemic. Such projections are, in turn, necessary to plan not only for HIV prevention and treatment, but also for other public health initiatives. In the late 1980s, Indian public health experts seriously misjudged the potential for an HIV epidemic, supposing that relatively conservative sexual behaviour would protect the Indian population. Whatever errors contributed to this false optimism – unrecognized HIV transmission through unsterile health care, or wrong assumptions about sexual behaviour – led to millions of HIV infections that might have been avoided with more effective prevention programmes during the 1990s. From 2005, the potential

[1] NACO. Facts and figures: HIV estimates – 2004. Available at: www.nacoonline.org/facts_hivestimates.htm. Accessed 9 November 2005.
[2] HIV prevalence is the percentage of the population living with HIV infection.
[3] Becker ML, Reza-Paul S, Ramesh BM, Washington R, Moses S, Blanchard JF. Association between medical injections and HIV infection in a community-based study in India. AIDS 2005; 19: 1334-1336.
[4] Tamil Nadu State AIDS Control Society. Activities of TANSACS. Chennai: TANSACS, 2005.
[5] NACO. Facts and figures: HIV estimates – 2003. Available at: www.nacoonline.org/facts_hivestimates.htm. Accessed 9 November 2005.

cost of further miscalculation is much greater due to the much larger existing number of HIV infections.

Asking for more information and attention to blood exposures does not imply any disregard for sexual transmission. Most Indian adults living with HIV – whether they are infected through medical injections, tattooing, or sex with FSWs – will be sexually active with their spouses, if not with others. Hence, preventing sexual transmission remains a priority no matter what might be discovered about HIV risks in health care and cosmetic services.

**Value of more data and analyses from India to understand India's HIV epidemic**

After Simoes and colleagues discovered HIV infections in FSWs in Tamil Nadu in 1986,[6] Government extended HIV testing through more than 70 facilities with the twin objectives of "identifying the geographical spread of HIV infection and determining the major modes of HIV transmission."[7] Subsequently, information to assess routes of HIV transmission in India comes from several sources, including:

1) NACO surveillance of HIV prevalence among women in antenatal clinics (ANC), FSWs, patients at sexually transmitted disease (STD) clinics, and several other groups;
2) research studies of risk factors for HIV prevalence and incidence; and
3) AIDS case reporting, i.e., NACO's surveillance of routes of HIV acquisition among inpatients with AIDS.

The most widely quoted and influential estimates of routes of transmission come from AIDS case reporting. As of 1993, with information on only 243 AIDS cases, NACO estimated that heterosexual transmission accounted for 77 percent of HIV infections in India, transfusion of infected blood and blood products for 13 percent, and IDU for 3.7 percent. Notably, NACO's 1993 estimates do not mention unsterile medical injections, dental care, or other health care procedures. Through 2005, the proportion of AIDS cases that NACO attributes to sexual contact increased to 86 percent, while the proportion attributed to blood transfusion fell to 2 percent, and NACO continues not to mention other blood exposures in health care or cosmetic services.

The attribution of most infections to sex and lack of attention to health care exposures (except blood transfusions) parallels – and very likely builds on – common interpretations of HIV epidemics in Africa. In the 1980s, epidemiologists recognized two patterns of HIV epidemics in the world. In Pattern 2 epidemics in Africa and the Caribbean, HIV infected men and women equally, few who were infected were MSMs or IDUs, and adult HIV prevalence often exceeded 1 percent. On the other hand, in Pattern 1 epidemics – in developed countries – most infections occurred in MSMs and IDUs, infections concentrated among men, and not more than 0.5 percent of adults were infected.

Over the years, Pattern 1 epidemics persisted in developed countries. Similarly, Pattern 2 epidemics continued in Africa and the Caribbean, with adult HIV prevalence increasing to more than 20 percent and even 35 percent in some countries. Importantly, Pattern 2 epidemics have continued to be exceptional outside of Africa and the

[6] Simoes EAP, Babu PG, Zjohn T, et al. Evidence for HTLV-III infection in prostitutes in Tamilnadu. Indian J Med Res 1987; 85: 335-338.
[7] NACO. Specialist's Training and Reference Module. New Delhi: NACO, no date.

Caribbean. Most Asian countries, including China, Vietnam, the Philippines, Bangladesh, and Pakistan, have Pattern 1 epidemics and/or very low adult HIV prevalence (near or below 0.1 percent). However, Pattern 2 epidemics have emerged in a handful of Asian countries, including India, Thailand, Cambodia, and Myanmar. India alone accounts for two-thirds of HIV infections in Asia.

Because HIV is a similar virus throughout the world, it is reasonable to expect to find similarities between India's epidemic and epidemics in other countries. However, there is a wide variety of HIV epidemics elsewhere in the world, and there is no simple way to determine which other country will provide information relevant to India's HIV epidemic. For example, adult HIV prevalence ranges from less than 1 percent to more than 35 percent in some countries with Pattern 2 epidemics, providing little guidance about what to expect in India.

Moreover, information on other countries with Pattern 2 epidemics is often unreliable and controversial, so that even if parallels could be established, the lessons for India are not clear. For example, the long-standing consensus that almost all HIV infections in African adults are from sexual contact has been challenged by recent analyses demonstrating lack of supporting evidence.[8] During subsequent journal-based debates, WHO and UNAIDS experts have acknowledged that unsafe medical injections may have contributed an important proportion of HIV infections in Africa, and that information on other invasive health care procedures is inadequate to assess their contribution.[9][10] Other recent research has discovered systematic infection control lapses in dental, pediatric, and maternal health care in South Africa.[11]

In short, reliable analyses and interpretations of India's HIV epidemic must be based on information about HIV prevalence, incidence,[12] and risk factors in India, without blind reliance on international parallels. Information that is already available provides a basis to challenge some common ideas, and points to additional research and analyses to describe more accurately India's HIV epidemic.

**Information on the contribution of sexual exposures to India's HIV epidemic**

Almost as soon as HIV infections were discovered in February 1986 in FSWs in Chennai, most AIDS experts agreed that most infections in India come from heterosexual exposures, and that blood exposures (other than transfusions and IDU) account for a negligible proportion of HIV infections. This consensus emerged with limited supporting evidence and continues despite mounting conflicting evidence.

Because of recognized conservative sexual behaviour among non-FSW women in India, the consensus view that sex accounts for most infections entails the additional –

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[8] Gisselquist D, Potterat JJ, Brody S, Vachon F. Let it be sexual: how health care transmission of AIDS in Africa was ignored. *International Journal of STD & AIDS* 2003; 14: 148-161. Available at: http://www.rsm.ac.uk/new/std148main.pdf

[9] Schmid GP, Buve A, Mugyenyi P, et al. Transmission of HIV-1 infection in sub-Saharan Africa and effect of elimination of unsafe injections. Lancet 2004; 363:482-88.

[10] Schmid GP, Buve A, Calleja JG, Ghys PD, Boerma JT. Unsafe injections and transmission of HIV-1 in sub-Saharan Africa, author's reply [letter]. Lancet 2004; 363: 1649-1650.

[11] Shisana O, Mehtar S, Mosala T, et al. HIV risk exposure among young children: a study of 2-9 year olds served by public health facilities in the Free State, South Africa. Cape Town: HSRC, 2005.

[12] HIV incidence is the rate at which new infections occur; for most purposes, this can be understood as the percentage of HIV-negative people who become HIV-positive in a year.

arguably stigmatizing – hypothesis that FSWs account directly and indirectly for most infections. For example, an influential 1994 article interprets available data to show that: "a pool of female [commercial sex workers] CSWs with increasing HIV prevalence transmits infection to a larger male client pool, who subsequently transmit infection to their wives and ultimately to their children".[13] More than a decade later, Bollinger in 2005 averred that India's HIV epidemic "still remains largely limited to specific high-risk groups of injection drug users, men who have sex with men, female sex workers, their male clients and the spouses of these men".[14]

*Sexual HIV transmission from FSWs*

The hypothesis that FSWs account for most infections requires large numbers of FWSs. Hence, the percentage of women who are FSWs has been an issue among AIDS experts. In 2005, NACO's website[15] reported that "…hard data is not available…on size estimation of female sex workers in the country, except the number arrived from the mapping of high-risk groups conducted by SACS [State AIDS Control Societies]". An early report from this mapping estimated 168,000 sex workers in 22 states. If we assume these states contain half of India's 260 million women aged 15-49 years, we can estimate that somewhere between 0.1 percent and 0.2 percent of women are FSWs. Despite data from SACS' mapping, NACO subsequently accepted the World Bank's estimate of 2.9 million FSWs in India, or roughly 1.1 percent of women aged 15-49 years. Along the same lines, a recent model supposed 2 million FSWs in India.[16]

If we combine World Bank estimates that 1.1 percent of Indian women are FSWs with findings from a recent NACO survey that FSWs average 572 client contacts per year,[17] we can calculate well over a billion client-visits per year. These calculations require, for example, that 20 percent of Indian men aged 15-49 years have paid sex with FSWs more than 25 times per year. Such figures are far out of line with recent survey findings on sexual behaviour. For example, only 1.9 percent of a random sample of adult males in Bagalkot District, Karnataka, and 5.5 percent in Tamil Nadu report paid sex ever.[18][19] In a 2001 national survey, only 12 percent of men aged 15-49 years reported a non-regular sexual partner in the last year.[20]

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[13] Jain MK, John TJ, Keusch GT. A review of human immunodeficiency virus infection in India. J Acquir Immune Defic Syndr 1994; 7: 1185-1194.

[14] Bollinger RC. IJMR special issue on HIV/AIDS: editorial overview. Indian J Med Res 2005; 121: 209-210.

[15] NACO. Facts and f igures: HIV estimates – 2003. Available at: www.nacoonline.org/facts_hivestimates.htm. Accessed 9 November 2005.

[16] Venkataramana CBS, Sarada PV. Extent and speed of spread of HIV infection in India through the commercial sex networks: a perspective. Trop Med Int Hygiene 2001: 6: 1040-1061.

[17] NACO. National Baseline High Risk and Bridge Population Behavioural Surveillance Survey -- 2001 Part 1 (FSW and their clients) New Delhi: NACO, no date. Available at: http://www.nacoonline.org/publications.htm. Accessed 5 November 2005.

[18] India-Canada Collaborative HIV/AIDS Project (ICHAP). Community-based HIV prevalence study in ICHAP demonstration project area, key findings. Bangalore: ICHAP, 2004. This study includes annexures, including annexure 1: detailed tables.

[19] AIDS Prevention and Control Project (APAC). Prevalence of STI & HIV Among General Population in Tamil Nadu. Chennai: APAC, no date.

[20] NACO. National Baseline General Population Behavioural Surveillance Survey – 2001. New Delhi: NACO, no date. Available at: http:///www.nacoonline.org/publications.htm. Accessed 5 November 2005.

Recent NACO surveys and estimates allow an estimate of the annual number of FSW-to-client HIV transmissions. From NACO surveys, FSWs have 572 client contacts per year, with 75 percent of clients using condoms.[21] In 2003, NACO estimated that 71,000 FSWs were HIV-positive.[22] From these figures, the annual number of client unprotected sexual contacts with HIV-positive FSWs would be 71,000 x 572 x 0.25 = 10,153,000. Assuming a transmission efficiency of 0.1 percent per contact,[2324] and assuming that no clients are already HIV-positive, FSWs would infect 10,000 clients per year. Ten thousand FSW-to-client sexual transmissions per year from 1995 (with increasing HIV prevalence among FSWs offset by more condom use and lower STD prevalence over time) accounts for less than 5 percent of the estimated HIV infections among men in 2005.

Information from truckers, youth, and other men similarly shows too few FSW contacts to satisfy models of India's HIV epidemic flowing through FSWs to clients. For example, in repeated surveys during 1997-2002 among truckers in Tamil Nadu, 16-27 percent of truckers reported means of 5-10 FSW contacts in the past year, of which 66-94 percent were protected by condoms. From these data, the average trucker during these years had less than 1 unprotected sexual contact with FSWs per year.[25] Assuming 25 percent HIV prevalence among FSWs and a transmission efficiency of 0.001 per unprotected contact, it would take more than 40 years for FSWs to infect even 1 percent of truckers with HIV.

*HIV and sexual behaviour in the general population*

If FSWs cannot account for enough heterosexual transmission to explain India's HIV epidemic, it is logically possible that HIV-infected non-FSW women sexually transmit HIV to men. However, this view is inconsistent with the distribution of HIV infection and sexual behaviour in the general population. In a 2001 national survey of sexual behaviour, only 2 percent (12 percent) of women (men) aged 15-49 years reported any non-regular partner in the past year.[26]

Notably, HIV prevalence is higher in many rural districts than in major cities. For example, a random sample survey in Chennai slums, found 1.0 percent (0.2 percent) HIV prevalence in men (women), with IDU and MSM risk behaviours associated with much of the infection.[27] On the other hand, a survey in rural Tamil Nadu found 1.5 percent (2.1

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[21] NACO. National Baseline High Risk and Bridge Population Behavioural Surveillance Survey -- 2001 Part 1 (FSW and their clients) New Delhi: NACO, no date. Available at: http://www.nacoonline.org/publications.htm. Accessed 5 November 2005.

[22] NACO. Facts and f igures: HIV estimates – 2003. Available at: www.nacoonline.org/facts_hivestimates.htm. Accessed 9 November 2005.

[23] Gray RH, Wawer MJ, Brookmeyer R, et al. Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda. Lancet 2001; 357: 1149-1153.

[24] Mastro TD, Kitayaport D. HIV type 1 transmission probabilities: estimates from epidemiological studies. AIDS Res Hum Retroviruses 1998 (suppl 3): S223-S227.

[25] AIDS Prevention and Control Project (APAC). HIV Risk Behavioural Surveillance Survey in Tamil Nadu, Wave VII. Available at: http://apacvhs.org. Accessed 3 July 2005.

[26] NACO. National Baseline General Population Behavioural Surveillance Survey – 2001. New Delhi: NACO, no date. Available at: http:///www.nacoonline.org/publications.htm. Accessed 5 November 2005.

[27] Thomas K, Thyagarajan SP, Jeyaseelan L, et al. Community prevalence of sexually transmitted diseases and human immunodeficiency virus infection in Tamil Nadu, India: a probability proportional to size cluster survey. Nat Med J India 2002; 15: 135-140.

percent) HIV prevalence among men (women).[28] This survey tested both partners in 384 couples; all 16 HIV infections in these couples appeared in serodiscordant couples.

Some of the highest levels of HIV prevalence in the general population in India – 3.3 percent among men and 2.5 percent among women – were reported from a 2003 study in Bagalkot District. Only 2 percent of women and 13 percent of men in Bagalkot reported any of three risky sexual behaviours (sex with a non-regular partner in the past year, more than one lifetime partner, and ever paid or received money for sex).[29] Population attributable fractions (PAFs)[30] of prevalent HIV associated with any vs. none of these three behaviours were 15.4 percent for men and 4.2 percent for women. Curiously, HIV prevalence was highest in women aged 45-49 years, and for men was highest for those aged 25-29 years. In men, HIV prevalence was similar across high to low caste Hindus (increasing from 3.7 percent to 4.2 percent); but for women, prevalence increased from 1.6 percent to 7.2 percent from high to low castes. Among occupations, HIV prevalence was highest among agricultural labourers (6.2 percent), whereas for those in business, non-agricultural labour, and salaried employment, prevalence ranged from 2.8 percent to 4.4 percent.

In sum, virtually all empiric evidence from mapping of FSWs, from studies of sexual behaviour, and from serosurveys of HIV infection in the general population is inconsistent with the view that sexual risk behaviour explains most HIV infection in India. Because men and women sometimes lie about their sexual behaviour, some of this evidence can be dismissed, which takes away conflicting evidence without adding supportive evidence.

*Assessing indirect evidence pointing to sexual transmission*

Concentration of HIV infection among sexually active adults is often presented as evidence for sexual transmission. However, non-sexual diseases such as tuberculosis can show a similar age concentration. Furthermore, few studies of HIV in India have tested children aged 2-15 years, or adults over 50 years, so that little is known about frequency of HIV infection in those age groups in India.

Similarly, high HIV prevalence among FSWs and STD patients is often presented as evidence that sex accounts for most HIV infections in India. However, HIV prevalence remains low among FSWs and STD patients in much of India and in regional countries (e.g., Bangladesh, the Philippines, and Vietnam); in other words, sexual risk behaviour alone does not consistently lead to high HIV prevalence.

Moreover, the source of HIV infections in FSWs and STD patients is unclear, because these groups receive frequent injections to treat or even to prevent STD. For example, in a recent survey FSWs reported "I take injections regularly to prevent diseases."[31] Similarly, men in Chennai "often request antibiotic injections after risky

[28] Ibid.

[29] India-Canada Collaborative HIV/AIDS Project (ICHAP). Community-based HIV prevalence study in ICHAP demonstration project area, key findings. Bangalore: ICHAP, 2004. This study includes annexures, including annexure 1: detailed tables.

[30] The population attributable fraction of HIV associated with a specific risk is the estimated percentage of HIV infection that would not have occurred in a population if no one had been exposed to that risk.

[31] AIDS Prevention and Control Project (APAC). HIV risk behaviour surveillance survey in Tamil Nadu, wave VII. Chennai: APAC, no date. Available at: apacvhs.org. Accessed 3 July 2005.

sexual encounters to treat possible STI [sexually transmitted infection]…"[32] Many studies report high prevalence of hepatitis B and C virus (HBV and HCV) infections in FSWs and STD patients, with associations between hepatitis and HIV infections. For example, data from a study in Pondicherry, show 21 percent of STD patients to have HCV antibody, 23 percent to be HIV-positive, and a 19 times greater risk to be HIV-positive among persons with compared to persons without HCV antibody.[33] Because HCV is only rarely transmitted sexually,[34] HCV infection is evidence for blood exposures, which might also explain at least some of the observed HIV infections.

**Information on the contribution of blood exposures (except blood transfusions and injection drug use) to India's HIV epidemic**

*Parenteral exposures in India*

Unsterile medical injections are probably the most common blood exposure in India. A study of injection practices in Vellore in the 1990s found that most of 80 registered medical practitioners routinely reused syringes and needles without sterilization; no clinics stocked disposable syringes, and only one patient brought one for own use.[35] Within the last 5-10 years, as the public has become more aware of risks with blood exposures, single use of disposable syringes has become more common.

Even so, a national survey of medical injection practices by the All India Institute of Medical Science (AIIMS) in 2002-03 reports 5.8 injections per person per year, of which 32 percent were a potential risk to transmit bloodborne viruses due to use of unsterile or unreliably sterile needles and/or syringes.[36] The percentage of unsterile or unreliably sterile injections was strongly correlated with use of glass syringes. The risk to receive an unsafe injection was comparable in public and private formal clinics, but roughly 1.5 times more likely in informal private settings. A cursory overview of data from the AIIMS study suggests that people in southern states with relatively high HIV prevalence receive more unsterile or unreliably sterile injections than do people in other parts of India. Several studies of injection practices in north India in 2002-03 describe frequent reuse of syringes while changing only needles; some clinics saved new equipment for better-off patients.[3738]

Mounting concerns about injection safety have stimulated recent policy changes. For example, Kerala from 2003 shifted most injections in public hospitals and clinics to auto-disable (AD) syringes, which break after one use. From 2006, Government plans to

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[32] Marx MA, Murugavel KG, Tarwater PM, et al. Association of hepatitis C virus infection with sexual exposure in southern India. Clin Infect Dis 2003; 37: 514-520.

[33] Singh S, Thappa DM, Jaisankar TJ, Sujatha S. Sexual co-transmission of HIV, hepatitis B, and hepatitis C viruses. Sex Transm Inf 2000; 76: 317-318.

[34] Vandelli C, Renzo F, Romano L, et al. Lack of evidence of sexual transmission of hepatitis C among monogamous couples: results of a 10-year prospective follow-up study. Am J Gastroenterol 2004; 99: 855-859.

[35] Lakshman M, Nichter M. Contamination of medicine injection paraphernalia used by registered medical practitioners in south India: an ethnographic study. Soc Sci Med 2000; 51: 11-28.

[36] Hutin YJF. Injection safety in India: from assessment to policy. Powerpoint presentation at Global Infection Control and Injection Safety 2004, Cape Town, South Africa, 20-22 October 2004.

[37] Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. Safer injections, fewer injections: injection safety in rural north India. Trop Med Int Health 2005; 10: 423-432.

[38] Kotwal A, Priya R, Thakur R, Gupta V, Kotwal J, Seth T. Injection practices in a metropolis of north India: perceptions, determinants and issues of safety. Indian J Med Sci 2004; 58: 334-344.

shift all centrally-funded vaccinations to AD syringes, and plans are underway to establish a network of model injection centers to train health care professionals. In recent years, the Indian Medical Association[39] and Indian Academy of Pediatrics have begun to campaign for safe injections.[40]

Strategies to promote AD syringes for medical injections acknowledge serious problems with sterilization in health care settings. Even so, much less is known about infection control lapses in health care procedures other than injections. We found no published studies of blood exposures in dental care. Kermode and colleagues report routine reuse of suture and hypodermic needles during eye surgery after soaking in disinfectant or wiping with alcohol, as well as reuse of razors to shave patients for surgery.[41] In one health camp, a surgical team performed laparoscopic sterilizations on 48 women in just over two hours; the time allowed for each surgery appeared too brief to sterilize laparoscopes.[42]

Blood exposures are also common outside health care. For example, among women seeking treatment for sexually transmitted disease (STD) in Pune, 82 percent of female sex workers (FSW) and 69 percent of other women had at least one tattoo,[43] and 43 percent of male IDUs in Chennai had tattoos.[44] Panda et al. report customers standing in line for tattoos given with the same needle, reused without sterilization.[45] A survey of barbers in Nagpur City in 1998 reported over 80 percent of roadside barbers reusing blades to shave consecutive clients.[46]

*HIV transmission efficiency through blood exposures and survival outside the body*

Outside the body at room temperature, HIV in blood or plasma remains viable for weeks in a damp environment[47] (e.g., in a used syringe) and for hours if dry.[48] However, many people in India, including doctors, suppose that HIV dies very quickly outside the body. A headline in the Hindustan Times in May 2005 proclaims[49] "HIV is a delicate virus and doesn't last outside the body…" The article assures that dipping a razor in

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[39] Indian Medical Association. Policy on Safe Injections in Health Care Settings: 'Safe Injections Safe Live.' Available at: http://www.imanational.com/Projects1.asp. Accessed 29 July 2005.

[40] Recommendations. IAP workshop on safe injections practices: recommendations and IAP plan of action. Indian Pediatr 2005; 42: 155-161.

[41] Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. Safer injections, fewer injections: injection safety in rural north India. Trop Med Int Health 2005; 10: 423-432.

[42] Ramanathan M, Dilip TR, Padmadas SS. Quality of care in laparoscopic sterilization camps: observations from Kerala, India. Reproductive Health Matters 1995; 3: 84-93.

[43] Gangakhedkar RR, Bentley ME, Divekar AD, et al. Spread of HIV infection in married monogamous women in India. JAMA1997; 278: 2090-2092.

[44] Panda S, Kumar MS, Likabiraman S, et al. Risk factors for HIV infection in injection drug users and evidence for onward transmission of HIV to their sexual partners in Chennai, India. J Acquir Immune Defic Syndr 2005; 39: 9-15.

[45] Ibid.

[46] Khandait DW, Ambadekar NN, Vasudeo ND. Knowledge and practices about HIV transmission among barbers of Nagpur City. Indian J Med Sci 1999; 53: 167-171.

[47] Abdala N, Stephens PC, Griffith BP, Heimer R. Survival of HIV-1 in syringes. J Acquir Immune Defic Syndr 1999; 20: 73-80.

[48] Resnick L, Veren K, Salahuddin SZ, Tondreau S, Markham PD. Stability and inactivation of HTLV-III/LAV under clinical and laboratory conditions. JAMA 1986; 255: 1887-1891.

[49] Anonymous. (2005a). 'HIV is a delicate virus and doesn't last long outside the body, so casual contact is safe.' *Hindustan Times* 24 May 2005, p. 3.

water "is enough for the virus to die..." An article in the Indian Journal of Medical Sciences states[50] "HIV survival outside the body is reported to be in seconds, but it may be upto 10 to 15 minutes."

Similarly, most doctors and AIDS experts in India underestimate the transmission efficiency of HIV through unsterile injections and other blood exposures, supposing a risk of 0.3 percent to 0.5 percent only. These estimates of risk to transmit come from studies of European and US health care workers after percutaneous exposures to HIV (e.g., after needlestick accidents with needles previously used on HIV-positive patients), which report that 0.3 percent seroconverted.[51] However, most percutaneous exposures are shallow scratches that carry little risk. In a case-control study, deep injuries (sufficiently deep for the hole of the needle to be within the skin) accounted for 6.8 percent of percutaneous exposures and were 15 times more dangerous than other injuries.[52] From this, the calculated average risk to seroconvert after a deep needlestick accident is 2.3 percent.[53]

If injections are comparable to deep needlestick accidents, 2.3 percent is a good estimate of the risk to transmit HIV through unsterile, contaminated injections. However, other factors must be considered. For example, injections effectively wash the contents of the syringe and needle into the wound. Health care workers may rinse or otherwise try to clean syringes and needles without sterilization. Intravenous injections carry more risk than intramuscular or sub-cutaneous injections. Contaminated multi-dose vials may infect several subsequent patients. As for tattoos, repeat punctures carry more risk than single punctures, and ink may also be contaminated.

Additional information on HIV transmission efficiency through blood exposures comes from documented outbreaks of HIV infections traced to health care transmission. In 1988-89, invasive procedures at hospitals in Elista, Russia, and in neighboring communities transmitted HIV from one child (infected by its mother) directly and indirectly to more than 250 other children in less than a year.[5455] Other large nosocomial outbreaks have been documented among children in Romania[56] (more than 1,000 infected during 1987-90) and in Libya[57] (more than 400 children infected in 1997-99). In these outbreaks, suspected routes for HIV transmission include intravenous catheters and

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[50] Khandait DW, Ambadekar NN, Vasudeo ND. (1999). Knowledge and practices about HIV transmission among barbers of Nagpur City. *Indian J Med Sci*; 53: 167-171.

[51] Bell DM. Occupational risk of human immunodeficiency virus infection in healthcare workers: an overview. Am J Med 1997; 102 (suppl 5B): 9-15.

[52] Cardo DM, Culver DH, Ciesielski CA, et al. A case-control study of HIV seroconversion in health care workers after percutaneous exposure. N Eng J Med 1997; 337: 1485-1490.

[53] Gisselquist D. Estimating HIV transmission efficiency through unsafe medical injections. Int J STD AIDS 2002; 13: 152-159.

[54] Dehne KL, Pokrovskiy V, Kobyshcha, Schwartlander B. (2000). Update on the epidemics of HIV and other sexually transmitted infections in the newly independent states of the former Soviet Union. *AIDS*; 14 (suppl 3): S75-S84.

[55] Bobkov A, Garaev MM, Rzhaninova A, et al. (1994). Molecular epidemiology of HIV-1 in the former Soviet Union: analysis of env V3 sequences and their correlation with epidemiologic data. *AIDS*; 8: 619-624.

[56] Patrascu IV, Dumitrescu O. (1993). The epidemic of human immunodeficiency virus infection in Romanian children. 1993. *AIDS Res Hum Retroviruses*. 1993; 9: 99-104.

[57] Visco-Comandini U, Cappiello G, Liuzzi G, et al. (2002). Monophyletic HIV type 1 CRF02-AG in a nosocomial outbreak in Benghazi, Libya. *AIDS Res Hum Retroviruses*; 18: 727-732.

injections, intramuscular injections, and contaminated multi-dose vials. Considering the speed of transmission from one child to another, especially in Russia and Libya, it is likely that transmission occurred after an average of not more than 10-20 procedures, which would imply a transmission efficiency of 5 percent to 10 percent. For some common medical procedures risks very likely exceed 10 percent.

Notably, changing needles while reusing syringes – a common practice in India[58] – allows pathogens to pass from patient to patient. Pathogens reach the syringe through multiple mechanisms, including suction when the socket of the needle is pulled away from the syringe and back pressure from the muscle. In a study reported in 1950, researchers injected saline solution into mice infected with *Streptococcus pneumoniae*, changed the needle, and then injected uninfected mice; within 48 hours, 73 percent (19 of 26) of the initially uninfected mice died.[59]

*Evidence for HIV transmission through blood exposures in India*

Model-based estimates: Building on recent estimates of the number of unsterile medical injections in India, Hauri and colleagues estimated that medical injections accounted for 160,000 new HIV infections in India (and smaller regional countries) in 2000,[60] and Singhal estimated that injections infected 20,000-60,000 with HIV in 2001.[61] These model-based estimates depend heavily on assumptions, including especially the transmission efficiency of HIV through injections with unsterilized equipment. Hauri et al. assume a transmission efficiency of 1.2 percent, whereas Singhal assumes 0.3 percent. In addition, these estimates are limited to injections, ignoring other common blood exposures.

Evidence from studies of risk factors for HIV infection: We found 5 studies of risks for prevalent or incident HIV in India that report information on blood exposures (other than injection drug use and transfusions) in STD patients, outpatients, blood donors, injection drug users, and the general population (Table 1.1; references in the table are not repeated in the text). In these studies, persons reporting more blood exposures – injections, tattoos, or blood donations – consistently were more likely to be or to become HIV positive than were persons not reporting these risks.

[58] Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. Safer injections, fewer injections: injection safety in rural north India. Trop Med Int Health 2005; 10: 423-432.
[59] Evans RJ, Spooner ETC. A possible mode of transfer of infection for syringes used for mass inoculation. Br Med J 1950; ii: 185-188.
[60] Hauri AM, Armstrong GL, Hutin YJF. The global burden of disease attributable to contaminated injections given in health care settings. Int J STD AIDS 2004; 15: 7-16.
[61] Singhal T. Burden of HIV in India due to unsafe injections and blood transfusions. MSc thesis submitted to University of London, 2002.

**Table 1.1: Studies showing blood exposures as risks for HIV infections**

| State, city, year of research | Type of study | Population studied | Risk factor, time of exposure | ρ | Relative risk* or [adjusted relative risk] | PAF [adjusted PAF] (%) |
|---|---|---|---|---|---|---|
| Andhra Pradesh, rural, 2000[62] | Prevalence cross section | Outpatients 18-49 yrs | >10 injections, exposure time not given | NR | >1† | |
| Delhi, 1989-90[63] | Prevalence case-control | Blood donors | Donate ≥ 1/month, current? | 87 | 14, † | 81 |
| | | | Donate at >1 blood bank, current? | 93 | 17, † | 88 |
| Karnataka, 2003[6465] | Prevalence cross section | Adults, 15-49 years | Injections ever as adult | 95 | 2.01 [1.59] | 498 [36] |
| | | | Injections last year | NA | 1.04/injection† | NA |
| Maharashtra, Pune, 1993-2000[66]‡ | Incidence cohort | STD clinic attendees | Injection last 3 months | 36 | 1.3 | 9.4 |
| | | | Tattoo last 3 months | 2.7 | 2.4† | 3.5 |
| Maharashtra, Pune, 1993-95[67] | Prevalence cross section | STD clinic attendees | Injection last 6 months? | 54 | 1.1 | 5.1 |
| | | | Tattoo since 1986 | 23 | 1.3† | 6.7 [5.6] |
| Tamil Nadu, Chennai, 2003[68] | Prevalence cross section | IDUs | Tattoo ever | 43 | 35 [2.4] | 84 [53] |

*Relative risk, rate ratio, or odds ratio.
†These relative risks are significant, i.e., there is a less than 5% chance that the association is a statistical accident.
‡Many other papers have been published from this study reporting some additional data.
PAF: population attributable fraction. ρ: % of total, person-years, or controls exposed.

Among STD patients in Pune, 9.4 percent of incident (new) infections were associated with having an injection, and 3.5 percent were associated with having a tattoo during follow-up (i.e., the population attributable fractions [PAF] of HIV associated with injections and tattoos were 9.4 percent and 3.5 percent, respectively). From this it appears that an important proportion of HIV infections in sex workers, clients, and STD patients may not come from sexual exposures, but rather from blood exposures, including injections to treat STD.

The one study that collected information from the general population – a random sample of adults in Bagalkot District of Karnataka – found that having an injection as an adult increased a person's risk (odds ratio, adjusted for age, urban/rural residence, occupation, sexual behaviour, marital status, education, and caste) to be HIV-positive by

[62] Solomon SS, Pulimi S, Rodriquez II, et al. Dried blood spots are an acceptable and useful HIV surveillance tool in a remote developing world setting. Int J STD AIDS 2000; 15: 658-661.
[63] Chattopadhya D, Riley LW, Kumari S. Behavioural risk factors for acquisition of HIV infection and knowledge about AIDS among male professional blood donors in Delhi. Bull WHO 1991; 69: 319-323.
[64] Becker ML, Reza-Paul S, Ramesh BM, Washington R, Moses S, Blanchard JF. Association between medical injections and HIV infection in a community-based study in India. AIDS 2005; 19: 1334-1336.
[65] India-Canada Collaborative HIV/AIDS Project (ICHAP). Community-based HIV prevalence study in ICHAP demonstration project area, key findings. Bangalore: ICHAP, 2004. This study includes annexures, including annexure 1: detailed tables.
[66] Reynolds SJ, Risbud AR, Shepherd ME, et al. Recent herpes simplex virus type 2 infection and the risk of human immunodeficiency virus type 1 acquisition in India. J Infect Dis 2003; 187: 1513-1521.
[67] Mehendale SM, Shepherd ME, Divekar AD, et al. Evidence for high prevalence & rapid transmission of HIV among individuals attending STD clinics in Pune, India. Indian J Med Res 1996; 104: 327-335.
[68] Panda S, Kumar MS, Lokabiraman S, et al. Risk factors for HIV infection in injection drug users and evidence for onward transmission of HIV to their sexual partners in Chennai, India. J Acquir Immune Defic Syndr 2005; 39: 9-15.

1.6 times (95 percent confidence interval: 0.49, 5.2). Ninety-seven percent of infected adults reported injections. From this, we can estimate that 36 percent of HIV infections in adults were from unsterile medical injections (i.e., that the PAF of HIV associated with injection is 36 percent); however, the 95 percent confidence interval for this estimate ranges from 0 percent to well over two-thirds.

On the basis of the limited available epidemiological evidence – from 5 studies summarized in Table 1.1 – one can say that the probability that medical injections, tattoos, dental care, and other blood exposures collectively account for less than 10 percent of India's HIV infections is very small, and that very likely the figure is much more. This summary assessment corresponds to recent model-based estimates reported above.

Reported nosocomial and unexplained HIV infections: Many published studies as well as unpublished information describe nosocomial and unexplained HIV infections in India (Table 1.2; references in the table are not repeated in the text). Singhal summarized eight studies of HIV in children during 1997-2002. In an aggregate total of 618 HIV-infected children, 68 (11 percent) infections were attributed to transfusions of blood and blood products and 17 (2.8 percent) to unknown non-vertical routes of infection.

Other studies report additional unexplained infections in children. For example, 7 infants in a Mumbai orphanage seroconverted during 1996-97. Sequencing of HIV from 6 pointed to a linked outbreak. HIV transmission to these children is suspected to have occurred during October 1996 treatment in a Mumbai nursing home. Two children received blood or blood products; for the remaining 5, the reported risks are "intravenous antibiotic treatment and routine immunization."

**Table 1.2: Nosocomial and unexplained HIV infections, selected studies**

| State, city, year of field research | Population studied | Total HIV+ cases | Non-vertical, non-sexual cases | | |
|---|---|---|---|---|---|
| | | | Suspected route of transmission | Number | % |
| India, 1992-2002[69] | Children | 618* | Blood transfusion | 68 | 11 |
| | | | Unknown | 17 | 2.8 |
| India, 1987-2001[70] | Adults | 3,508† | Blood transfusion | 353 | 10 |
| | | | Injections, surgeries, other medical exposures | 34 | 1.0 |
| | | | Unknown | 47 | 1.3 |
| Bihar, no date[71] | Kala-azar patients | 7 | Kala-azar treatment | ~7 | ~100 |
| Bihar, 1995-98[72] | Kala-azar patients | 2 | Kala-azar treatment | ~2 | ~100 |
| Maharashtra, Mumbai, 1996-97[73] | Children | 7 | Blood and blood products | 2 | 29 |
| | | | Injections | 5 | 71 |
| Maharashtra, Pune, 1988-89[74] | Commercial plasma donors | 97 | Plasma collection | <97 | <100 |
| New Delhi, 2003[75] | Adult | 1 | Anti-rabies vaccination | 1 | NA |
| Tamil Nadu, Chennai, 1996-2000[76] | Children | 58 | Blood transfusion | 11 | 19 |
| | | | Unknown | 4 | 7.1 |
| Tamil Nadu, Chennai, 1997-98[77] | Adults | 148 | Blood transfusion | 3 | 2.0 |
| | | | Unknown | 4 | 2.7 |

* Summary of 8 studies.
† Summary of 26 studies.

In a summary of 26 studies of HIV infection among adults during 1987-2001, Singhal finds a total of 353 (10 percent) infections attributed to blood transfusion, 34 (1.0 percent) to injections and other medical exposures, and 47 (1.3 percent) for which the route of infection is considered to be unknown.

In 1989, the National Institute of Virology discovered an outbreak of HIV infection among commercial plasma donors. In January-February 1989, samples from 97 of 129 donors tested HIV-positive. The authors speculated that most of these infections came from "a common source at any one of the commercial establishments where they sold their plasma."

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[69] Singhal T. Burden of HIV in India due to unsafe injections and blood transfusions. MSc thesis submitted to University of London, 2002.
[70] Ibid.
[71] Sinha PK, Rabidas VN, Pandey K, et al. Visceral leishmaniasis and HIV coinfection in Bihar, India. J Acquir Immune Defic Syndr 2003; 32: 115-115.
[72] Singh S, Dwivedi SN, Sood R, Wali JP. Hepatitis B, C and human immunodeficiency virus infections in multiply-injected kala-azar patients in Delhi. Scand J Infect Dis 2000; 32: 3-6.
[73] Christiansen CB, Nielsen C, Machucca R. Cluster of HIV-1 infection among children in Indian Hospital in Bombay. Informal report to World Health Organization, September 1998. Department of Virology, Statens Serum Institute, Copenhagen, Denmark, 1998.
[74] Banerjee K, Rodrigues J, Israel Z, Kulkarni S, Thakar M. Outbreak of HIV seropositivity among commercial plasma donors in Pune, India. Lancet 1989; ii: 166.
[75] Singh S. Human immunodeficiency virus transmitted through sheep brain anti-rabies vaccination. Vaccine 2003; 21: 4119.
[76] Madhivanan P, Mothi SN, Kumarasamy N, et al. Clinical manifestations of HIV infected children. Ind J Ped 2003; 70: 615-620.
[77] Rogers MC, Gopalkrishnan G, Kumarasamy N, et al. HIV in couples in South India; implications for prevention. Int J STD AIDS 2005; 16: 442-445.

The recent expansion of HIV testing to most pregnant women and to cooperating spouses through the Prevention of Parent to Child Transmission (PPTCT) programme has found an unexpected large percentage of HIV-positive women with HIV-negative husbands. For example, from data on more than 500,000 women tested for HIV in several southern states during 2001-05, more than 700 men with HIV-positive wives (23 percent of all men tested) were HIV-negative (Table 1.3).

**Table 1.3: Percentage of husbands found to be HIV-negative after wives test HIV-positive during PPTCT programmes**

| Community | Period | Women | | Husbands | | HIV-negative husbands as % of husbands tested |
|---|---|---|---|---|---|---|
| | | tested | HIV-positive | tested | HIV-negative | |
| Maharashtra | Sept 2002-Sept 2004 | 211,057 | 2,729 | 1,041 | 222 | 21 |
| Mumbai | 2002 | 10,425 | 387 | 240 | 119 | 50 |
| | 2003 | 39,989 | 695 | 275 | 60 | 22 |
| | Jan-Jul 2004 | 31,482 | 474 | 197 | 56 | 28 |
| | Aug-Dec 2004 | 21,932 | 342 | 141 | 34 | 24 |
| | Jan-Aug 2005 | 35,573 | 488 | 209 | 33 | 16 |
| Goa Medical College | Apr-Dec 2003 | 2,567 | 38 | 29 | 10 | 34 |
| | 2004 | 3,717 | 47 | 44 | 9 | 20 |
| | Jan-May 2005 | 1,724 | 27 | 15 | 4 | 27 |
| | Apr 2003-May 2005 | 8,008 | 112 | 88 | 23 | 26 |
| Karnataka | 2004 | 102,354 | 1,130 | 537 | 83 | 15 |
| Karnataka | Jan-Jun 2005 | 53,279 | 595 | 329 | 67 | 20 |
| Total | | 522,107 | 7,064 | 3,145 | 720 | 23 |

PPTCT: Prevention of parent to child transmission

**Information from AIDS case surveillance on routes of HIV transmission in India**

NACO's widely quoted estimates of the proportion of HIV infection in India from various routes of transmission (currently 86 percent from sexual contact, 2 percent from contaminated blood transfusion, etc.) come from AIDS case reporting. SACS/NACO asks government hospitals and sometimes other institutions to report AIDS cases; because AIDS case reporting is voluntary, these institutions may or may not respond to this request. In institutions that do report, doctors (or counselors) assess and report routes of HIV acquisition for each inpatient with AIDS.

Assessing routes of HIV acquisition during AIDS case reporting in India and other countries with Pattern 2 epidemics is superficially similar to what is done in Europe, the US, and other countries with Pattern 1 epidemics. However, there are major differences in practice, and the results are arguably much less reliable in countries with Pattern 2 epidemics.

In countries with Pattern 1 epidemics, most persons with AIDS report what are recognized throughout the world to be high-risk behaviours for HIV acquisition – i.e. most report IDU and/or anal sex among MSMs. Whatever other risks these people might have, it is reasonable to assume that their HIV infections came from IDU or anal sex

among men. In the US, for example, the Centers for Disease Control and Prevention (CDC) have established a hierarchy of "transmission categories."[78] During AIDS case reporting, adults and adolescents who are MSMs, IDUs, or both are assigned to categories 1 to 3, no matter what other risks they may have. These 3 categories account for 75 percent of cumulative AIDS cases in adults and adolescents through 2003.

In CDC's hierarchy of transmission categories, hemophilia is the 4th ranked risk; roughly 1 percent of AIDS cases have been assigned to this category. The 5th transmission category, "heterosexual contact," is divided into sub-categories based on sexual contact with specific persons at high risk for HIV (e.g., "sex with injection drug user", "sex with bisexual male", "sex with HIV-infected person, risk factor not specified" etc.). HIV infections in people who have been heterosexually promiscuous, or are FSWs, are not attributed to "heterosexual contact" unless they report specific contacts with known HIV-infected or high risk persons. (Notably, studies in the US and many other countries find low HIV prevalence among FSWs except those who are associated with drug using communities.) The category "heterosexual contact" (all sub-categories together) accounts for only 12 percent of cumulative AIDS cases that have been reported to CDC. The 6th ranked risk, receipt of blood products, accounts for 1 percent of AIDS cases. And 10 percent of AIDS cases are listed as "other/risk factor not reported or identified."

In India and other Pattern 2 countries – where only a minority of AIDS cases are IDUs or MSMs – it is not easy to determine the source of HIV infection for most AIDS cases. Most HIV-positive persons in India – including FSWs and clients – have had blood as well as sexual exposures. Often, specific HIV-infected or high-risk heterosexual partners are not known. Moreover, exposures responsible for HIV infections very likely occurred 5-15 years in the past.

When HIV-infected people have had multiple possible exposures to HIV – such as medical injections, tattoos, and FSW contact – several methods are available to estimate percentages of HIV infections from each route. For example, researchers may identify people with and without HIV infections, and determine what risks have been more common in those who are infected. Another method is to trace and test contacts, including sexual contacts, people who share the same dentist, etc.

Although determining the source of HIV infections during AIDS case reporting is difficult in India and in other countries with Pattern 2 epidemics, we can assume that experts and the general public will continue to rely on it for information about routes of HIV transmission. Hence, it is important to review AIDS case reporting systems in India to understand possible errors and biases, and to take the necessary corrective measures.

[78] Centers for Disease Control and Prevention. HIV/AIDS 2003 Surveillance Report. Available at: http://www.cdc.gov/hiv/stats/2003SurveillanceReport. Accessed 16 October 2005.

# Chapter 2
# Objectives and Method

## Objectives

The two main objectives of this study on HIV from blood exposures in India have been:

1) To explore the contribution of blood exposures to the HIV epidemic in India.
2) To assess the reliability of information from AIDS case surveillance on routes of HIV transmission in India.

## Preparation and area of study

Preparatory work on the study was done during October 2004 to January 2005. This included (a) review of literature, (b) presentations by resource persons on transmission efficiencies through health care procedures and on surveillance systems, (c) selection of four districts to be studied, (d) recruitment of four field researchers to coordinate data collection in each of the districts, (e) discussions with key persons in the AIDS programme in India, (f) finalising the methods for data collection, and (g) development and pre-testing of the questionnaire.

The study was conducted in four states in southern India, viz. Tamil Nadu, Karnataka, Maharashtra and Goa. In each of these states, the district with the highest HIV prevalence in the general population was selected for primary data collection. Determination of these districts was based on ANC surveillance data for 2003-04 in three states (Table 2.1).

**Table 2.1: HIV prevalence in antenatal women**

| | Sangli | | Belgaum | | Namakkal | |
|---|---|---|---|---|---|---|
| | Sangli DH | Islampur FRU | Belgaum DH | Gokak FRU | Namakkal DH | Thiruchengodu FRU |
| 2003 | - | - | - | - | 5.75 | 0.50 |
| 2004 | 2.50 | 3.75 | 3.75 | 4.75 | - | - |

DH: District Hospital
FRU: First Referral Unit (a community health centre or taluk level hospital)

In Goa, as there is no ANC site in one of the two districts, district selection was based on HIV surveillance data. Two coastal talukas in South Goa, Mormugao and Salcete, accounted for **40 percent of HIV infections reported in Goa in 2003-04**. Accordingly, the districts selected were Belgaum in Karnataka, Sangli in Maharashtra, South Goa in Goa and Namakkal in Tamil Nadu (see Appendix A for district profiles).

## Data collection

Data collection was accomplished during the period February to April 2005, though some data collection continued beyond this period. The research team got together for three 2-day meetings during the data collection period.

The preliminary stage of data collection within each district included compiling a demographic profile of the district; listing relevant institutions and organizations, such as VCCTCs, care centers, drop-in centers, PLWHA groups/networks, NGOs, district

hospitals, health centers, private practitioners, and STD clinics; and searching for any micro-studies done in the district.

Subsequent data collection comprised five main components.

1) Interviewing PLWHAs (**Chapter 3**): We interviewed PLWHAs about their sexual and blood exposures and the counselling to which they had been exposed. We developed a questionnaire for this purpose, which we translated into the relevant languages. In each district, we interviewed 50 people (we tried to interview an equal number of men and women, but this was often not achieved). After 50 interviews, we modified the questionnaire to get more specific data on several points, and interviewed an additional 20 PLWHAs. We contacted PLWHAs to interview through positive networks, NGOs, private doctors and care homes (see Appendix B for details).

2) Collecting information on unexplained cases (**Chapter 4**): We tried to find PLWHA for which their HIV infection could not be attributed to heterosexual contact, MSM, IDU, or mother-to-child transmission (e.g., HIV-positive women with HIV-negative husbands and no other sexual partners, HIV-positive children with HIV-negative mothers). We asked VCCTCs, positive networks, NGOs, private practitioners treating AIDS patients, and other contacts in the districts whether they had come across any such cases. We collected detailed case histories from informants and, where possible, interviewed the HIV-positive person (or their parent, in the case of children with HIV-negative mothers).

3) Documenting blood exposures (**Chapter 5**): Within the limits of our time and resources, we identified and documented health and cosmetic practices in the districts that put people at risk for HIV acquisition through blood exposures. We observed and discussed blood exposures as risks for HIV – and changes over the years – with barbers, tattooists, dentists, doctors (including allopaths, homeopaths and ayurveds), and officials at blood banks. We also visited pharmacies and wholesalers to understand trends over recent years in sales of disposable needles, syringes, and saline sets. We interviewed people in the community to understand their level of awareness about risk to contract HIV through blood exposures and about relevant community practices. We reviewed information on blood exposures as risks for HIV infection in AIDS prevention messages, training modules and medical textbooks.

4) Documenting blood exposures of vulnerable groups (**Chapter 6**): We met with groups considered by AIDS programmers to be vulnerable due their sexual risks to understand their blood exposures during health care and other practices that might also be risks. In each of the 4 districts, we met with individuals or representatives from vulnerable groups (FSWs, MSM, truckers, and migrant populations) and/or NGOs working with these groups. Where possible, we identified health sites accessed by these groups, and visited those sites to observe the facilities and to talk with health care providers.

5) Assessing surveillance systems (**Chapter 7**): To understand how India's AIDS case surveillance system assesses and reports routes of transmission, we identified the hospitals in each district which report AIDS cases. We obtained and analysed formats and case history sheets for risk assessment, counselling, and reporting in hospitals, VCCTCs, and SACS. We also interviewed doctors, counsellors, officials of the four SACS, staff of reporting hospitals, and people living with HIV/AIDS to understand their roles in AIDS case reporting and/or to get their views on AIDS case reporting.

**Data analysis and reporting**

Data was analysed during the months of June to August. We presented findings at a meeting at the end of August with the heads of the partner organisations of NCA (South Asia) and at meetings in each of the four study districts in September and October. The district level meetings were organised and facilitated by positive networks (Sangli and Belgaum), a Community Care Center (South Goa) and an NGO (Namakkal). During a 2-day meeting in mid-October 2005, we shared our findings with policy makers, planners, researchers, and managers of public and private HIV/AIDS programs. Discussions during these meetings have been incorporated into this report, and especially into the recommendations (**Chapter 8**).

**Limitations**

As this was an independent study, it was difficult to access some institutions and NGOs. Interviews of PLWHA were conducted with whoever was available and willing to be interviewed. The lack of choice of who could be interviewed often meant high reliance on one source, which could bias the results. For instance, where many interviews were held with PLWHA who attended a private clinic, they were likely to be from better off sections of the community. Similarly, we sometimes had better access to FSWs and MSMs than to other HIV-positive persons.

Because we did not test anyone for HIV, we were unable to collect unbiased information about risks for persons with and without HIV infection. The information we collected on risks from people who are aware of their HIV infections is not comparable to similar information from persons who are HIV-negative or unaware of their HIV infection, because people who know they are HIV-positive are likely to have thought at length about their past risks. Hence, we do not attempt to estimate the proportions of infections in PLWHAs from blood or sexual exposures.

# Chapter 3
# Findings: Multiple exposures

In each of four districts, we interviewed 70 HIV-positive people about: (a) their sexual and blood exposures; (b) their perception of risk for HIV acquisition; and (c) risk assessment during counselling.

Our access to HIV-positive persons depended on the assistance of private doctors and service organizations. Because these differed from one district to the other, the characteristics of those we interviewed also varied from district to district. Although we tried to interview an unbiased sample of HIV-positive people from the general population, some of the organizations we relied on to find and contact PLWHAs work with vulnerable groups known to have more sexual exposures; hence, our sample may be somewhat biased towards persons with sexual risks (especially widows, but also some FSWs and MSMs). Nevertheless, we have interviewed a wide range of low to high-income rural and urban persons.

Because we did not interview a random sample of HIV-positive persons, we cannot say that the information we gathered is statistically accurate. On the other hand, there is no obvious reason to suspect that our sample is badly biased relative to blood exposures and risk assessment during counselling. For ease of presentation, we summarize information in terms of percentages, means, and ranges (without confidence intervals), which are intended to give a general idea of what might be the case. (As noted in the tables, some of the information is from 70 respondents in each community, while other information is from 50 or 20 respondents.)

Answers to many questions are different for women and men. We collected additional information from women on their obstetric history and exposures.

**When and why tested, and selected characteristics of those interviewed (Tables 3.1 and 3.2)**

Of those we interviewed, men were older and reported higher incomes than women. Five percent of HIV-positive men and 11 percent of women were less than 25 years old, while 43 percent of men and 15 percent of women were more than 35 years old. Twelve percent of men and 34 percent of women reported monthly income less than Rs.1,000, while 25 percent of men and 7 percent of women reported monthly incomes exceeding Rs.4,000.

**Table 3.1: Characteristics of persons interviewed (percent of persons interviewed)**

| District | Sex and number | Age | | | Income (rupees/month) | | | Residence | |
|---|---|---|---|---|---|---|---|---|---|
| | | <25 | 25-35 | >35 | <1000 | 1000-4,000 | >4,000 | Urban | Rural |
| Sangli | M 38 | 0 | 66 | 34 | 8 | 58 | 32 | 42 | 53 |
| | F 32 | 19 | 66 | 16 | 38 | 59 | 3 | 44 | 50 |
| Belgaum | M 46 | 2 | 37 | 61 | 15 | 59 | 26 | 35 | 65 |
| | F 24 | 25 | 63 | 13 | 17 | 63 | 17 | 46 | 54 |
| South Goa | M 34 | 12 | 47 | 41 | 12 | 68 | 18 | 47 | 53 |
| | F 36 | 6 | 72 | 22 | 39 | 50 | 3 | 47 | 50 |
| Namakkal | M 32 | 9 | 63 | 28 | 13 | 63 | 25 | NA | NA |
| | F 38 | 3 | 89 | 8 | 37 | 37 | 8 | NA | NA |

M: males. F: females. NA: not available.

In our sample, men were more likely than women to have become symptomatic before discovering their HIV infection: 72 percent of men vs. 48 percent of women were tested for HIV after referral by doctors due to illness. On the other hand, women were more likely than men to be tested after a spouse or child was determined to be HIV-positive (38 percent vs. 12 percent). Overall, only 9 percent of men and 2 percent of women tested because of awareness of risk, 3 percent tested for a visa, and none tested because of job requirement.

Other reasons for testing included routine antenatal test (less than 5 percent of women). Several people were tested without their informed consent. Some persons tested 3 or 4 times, apparently not ready to believe test results.

In many cases, men discover they are HIV-positive when they become sick. Then or later, wives also go for tests. We found more widows than widowers, and women appeared to survive longer than men after learning of their HIV infection; the percentage of HIV-positive women with infections detected before the year 2000 was 35 percent vs. 28 percent for men.

**Table 3.2: Date and reason for HIV tests (percent of respondents)***

| District | Sex and number | Date tested HIV+ | | | Doctor referral due to illness | Job require-ment | Visa appli-cation | Aware-ness of risk | Spouse or child HIV+ | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before 2000 | 2000-2002 | 2003-2005 | | | | | | |
| Sangli | M 38 | 24 | 21 | 55 | 53 | 0 | 0 | 16 | 37 | 0 |
| | F 32 | 16 | 38 | 47 | 16 | 0 | 0 | 0 | 81 | 3 |
| Belgaum | M 46 | 7 | 11 | 83 | 87 | 0 | 0 | 0 | 7 | 2 |
| | F 24 | 4 | 13 | 83 | 46 | 0 | 0 | 0 | 46 | 8 |
| South Goa | M 34 | 15 | 9 | 76 | 62 | 0 | 21 | 9 | 3 | 12 |
| | F 36 | 8 | 22 | 69 | 53 | 0 | 3 | 8 | 17 | 19 |
| Namak-kal | M 32 | 6 | 22 | 72 | 84 | 0 | 0 | 16 | 0 | 0 |
| | F 38 | 13 | 24 | 61 | 71 | 0 | 3 | 0 | 16 | 11 |

M: males. F: females.

*Percentages might not sum to 100 because several respondents gave more than one answer or no answer.

**Subjects' own ideas about how they might have acquired HIV (Tables 3.3)**

Across all communities, more women (82 percent) than men (74 percent) reported that they had an idea about how they were infected. Conversely, 18 percent of women and 26 percent of men reported no idea about how they were infected.

Most women (73 percent) believed they were infected through sex with their spouses, although some of these women firmly believe that their husbands did not acquire their infections through sexual exposures. On the other hand, only 2 of 105 HIV-positive men (2 percent) suspected sexual acquisition of HIV from their wives. In addition, 20 percent of men suspected sexual acquisition from FSWs, 37 percent from unspecified non-spouse heterosexual partners, and 2 percent from other men.

Two women suspected they were infected through medical injections, and 2 suspected blood transfusion. A number of men suspected HIV acquisition from non-sexual exposures, including shaving in the market, medical injections, and blood transfusions. One man suspected HIV acquisition from injection drug use.

Those who said that they were aware of other routes of infection may not have been aware of all routes, or may have had misconceptions about other routes. We did not explore this. What is relevant to note is that many people were aware of only the sexual route. This was particularly noticeable among women in Namakkal.

**Table 3.3: Suspected route of HIV infection (percent of respondents)**

| District | Sex and number | Has an idea about how he/she was infected | Suspects own HIV acquired through:* | | | | | Aware of risks other than suspected route of infection |
|---|---|---|---|---|---|---|---|---|
| | | | Sex: | | | Medical injections | Other† | |
| | | | With spouse | Paid sex | Other partner | | | |
| Sangli | M 25 | 76 | 0 | 48 | 16 | 0 | 8 | 84 |
| | F 25 | 92 | 88 | 0 | 0 | 0 | 4 | 96 |
| Belgaum | M 29 | 62 | 3 | 14 | 17 | 14 | 14 | 86 |
| | F 21 | 71 | 57 | 0 | 0 | 10 | 5 | 81 |
| South Goa | M 26 | 66 | 4 | 8 | 46‡ | 8 | 12 | 46 |
| | F 24 | 71 | 58 | 0 | 8 | 0 | 4 | 50 |
| Namakkal | M 25 | 96 | 0 | 4 | 84 | 0 | 8 | 52 |
| | F 25 | 92 | 84 | 0 | 8 | 0 | 0 | 36 |

NA: not applicable. M: males. F: females.
*Some of those who had an idea about how they acquired HIV infection refused to disclose that idea, while others offered several suspected routes of infection
†Other suspected routes of infection include: Sangli: 1 man and 1 woman from blood transfusions; Belgaum: 2 men from barbers, 1 man from a blood transfusion, and 1 woman from a blood test; South Goa: 1 man from blood donations, 1 woman from a blood transfusion, and 1 man from shaving in the market; Namakkal: 2 men from injection drug use.
‡Two men in South Goa suspected HIV acquisition from sex with men.

**Sexual exposures**

Most HIV-positive women (84 percent) reported that their spouse had been tested for HIV, of which 105 out of 109 (96 percent) were HIV-positive (Table 3.4). On the other hand, 62 percent of men reported that spouses were tested, of which only 62 percent (58 of 93) were HIV-positive. From this, we can conclude that the direction of HIV transmission between partners was most often from the husband to the wife, but the existence of discordant couples with HIV-positive wives suggests that some infections may have also passed from wives to husbands.

We asked 20 respondents in each community about lifetime sexual exposures (Table 3.5). Most women (out of 35) reported sex with a spouse, while 7 reported sex in exchange for money and 8 reported other sexual partners. Most of 45 men reported sex with a spouse, more than half reported sex in exchange for money, a quarter reported other sexual partners, and 4 (3 in South Goa and 1 in Namakkal) reported receptive anal sex.

**Table 3.4: HIV status of spouse or partner (percent of respondents reporting)**

| District | Sex and number | Partner, spouse tested | Partner, spouse | |
|---|---|---|---|---|
| | | | HIV+ | HIV- |
| Sangli | M 38 | 71 | 42 | 29 |
| | F 32 | 91 | 88 | 3 |
| Belgaum | M 46 | 72 | 41 | 30 |
| | F 24 | 92 | 88 | 4 |
| South Goa | M 34 | 50* | 32 | 18 |
| | F 36 | 69 | 67 | 3 |
| Namakkal | M 32 | 50 | 38 | 12 |
| | F 38 | 87 | 84 | 3 |

M: males. F: females

*In South Goa, 1 man reported that his male partner was tested and was HIV-positive, and 1 other man reported that a girlfriend was tested and was HIV-negative.

**Table 3.5: Lifetime sexual exposures (percent of respondents reporting)**

| District | Sex and number | heterosexual partners | | | MSM |
|---|---|---|---|---|---|
| | | Spouse | In exchange for money | Other* | |
| Sangli | M 13 | 85 | 85 | 0 | 0 |
| | F 7 | 100 | 0 | 0 | NA |
| Belgaum | M 17 | 94 | 18 | 35 | 0 |
| | F 3 | 100 | 0 | 0 | NA |
| South Goa | M 8 | 50 | 13 | 38 | 38 |
| | F 12 | 75 | 42 | 50 | NA |
| Namakkal | M 7 | 71 | 71 | 43 | 14 |
| | F 13 | 92 | 15 | 15 | NA |

MSM: men who have sex with men. NA: not applicable. M: males. F: females

*One or more long-term or short-term non-spouse and non-commercial partner(s).

**Blood exposures**

We asked respondents about illnesses and injections received in the 5 years before discovering they were positive. Many respondents reported symptoms that were very likely related to their HIV infections, including herpes, diarrhoea, and fever. Several reported operations (e.g., for appendicitis); others reported typhoid or tuberculosis; 4 reported STDs or symptoms.

Many respondents reported multiple injections in the 5 years before testing positive. For example, 76 percent of men in Sangli reported injections, including one man who reported 100 injections for STD treatment, and another who reported 150 for asthma; 59 percent of women in Sangli reported injections, including one woman who reported 25 for minor illnesses, and another who reported intravenous (IV) infusions for abdominal pain. In Belgaum, 85 percent of respondents reported injections, including one woman with 300 for recurrent fever, vomiting, and weakness and 4 men with 50-95 for various symptoms. In South Goa, 38 percent received vaccinations, 6 percent received 3 to 30 injections for STDs, and 59 percent received 1 to 100 injections for various ailments; some report “many injections,” and “cannot count.” In Namakkal, 93 percent

received 2 to 100 injections, including vaccinations. Surprisingly, no one in Namakkal reported injections for STD, even though most respondents reported HIV acquisition from sex (however, as reported in Table 3.3, many people in Namakkal were not aware of non-sexual routes of HIV acquisition).

We also asked if respondents preferred injections or oral medication. Generally, a majority of both men and women preferred tablets. However, in Sangli, three-quarters of men preferred injections.

**Table 3.6: Injections and infusions* reported in the 5 years before testing HIV-positive**

| District | Sex and number | Vaccinations† | STD treatment† | Other† | Total† |
|---|---|---|---|---|---|
| Sangli | M 38 | 0 | 11 (3-100) | 74 (1-150) | 76 (1-150) |
| | F 32 | 0 | 4 (5) | 56 (1-60 | 59 (1-60) |
| Belgaum | M 46 | 35 (1-25) | 6 (2) | 70 (1-150) | 83 (1-150) |
| | F 24 | 29 (1-5 | 0 | 79 (1-300 | 88 (1-300) |
| South Goa | M 34 | 41 (1-6 | 6 (3) | 68 (1-100) | 79 (1-100) |
| | F 36 | 36 (1-6) | 6 (15-30) | 53 (1-50) | 64 (1-50) |
| Namakkal | M 32 | 31 (1-7) | 0 | 90 (5-100) | 92 (5-100) |
| | F 38 | 8 (1-2) | 0 | 92 (2-60) | 95 (2-60 |

M: males. F: females. STD: sexually transmitted disease.
*For 20 respondents in each community, we asked about injections to treat STD and about infusions; for 50 respondents, we did not ask for this information specifically, but some respondents reported treatment for STD and/or infusions.
†The first number is the percentage of people reporting the procedure; numbers in parentheses give the range of the number of procedures per person for those reporting the procedure.

To get a better idea about the range of blood exposures which people experience, we asked respondents about lifetime blood exposures other than injections and infusions. Some of the exposures reported in Table 3.7 occurred after respondents learned they were HIV-positive, and represent a risk for onward transmission to others. Some of these exposures occurred more than 15 years ago, when HIV was rare in India, and so very likely had nothing to do with their infection. Even so, this information on blood exposures is relevant for further research on HIV transmission, as well as for HIV prevention programmes.

Overall, 31 percent of respondents reported dental care (1 to many times), 20 percent major or minor surgery (1-3 times), 39 percent hospitalization (1 to many times), 100 percent reported blood tests (1 to 20 times), 8 percent blood transfusions (1 to 3 times), 20 percent tuberculosis tests, and no one reported acupuncture. Most but not all of these procedures occurred before respondents tested positive. For example, in Sangli, 26 respondents reported surgeries (including at least two after testing HIV-positive); all the respondents reported 1 to 10 blood tests (including tests for HIV); and 25 had been to the dentist (including 10 within 5 years before testing positive, and 6 after testing positive). In Belgaum, 25 respondents reported dental care from 1 to 9 times, including at least one after testing HIV-positive; 12 reported 1 to 3 surgeries; 29 had been hospitalized; all reported 1 to 20 blood tests; and 5 reported blood transfusions.

In South Goa, 41 percent of respondents went to the dentist one or more times (including one person who reported many visits for cancer of the jaw). In Namakkal, 16 percent of men reported at least two blood transfusions and one woman reported three; 8 percent of respondents reported surgeries, including one 2 years and another 4 years before testing positive; 12 percent had been to the dentist, including one 3 years and another 1 year before testing positive.

In addition to blood exposures during health care, 38 percent reported tattoos at some time in their life. In South Goa, for example, 5 men reported tattoos 2 to 5 years before testing positive. Many tattoos reported in Table 3.7 were received during childhood, before HIV was common in India, and so could not account for HIV infections in the respondents. However, tattoos are a relevant risk for HIV acquisition among the children of the present and future generations.

Ten percent reported piercing 1 to 3 times (excluding piercing during childhood, which is generally done with a gold needle used only once, and which is unlikely to transmit HIV).

One respondent (in Namakkal) reported IDU.

**Table 3.7: Lifetime blood exposures (except medical injections and infusions)***

| District | Sex and number | Medical exposures† | | | | | | Cosmetic† | |
|---|---|---|---|---|---|---|---|---|---|
| | | Dental care | Major or minor surgery | Hospitalization | Blood tests‖ | Blood transfusion | Tuberculosis test | Tattooing | Nose, ear piercing‡ |
| Sangli | M 38 | 32 (1-6) | 34 (1-2) | 71 (1-6) | 100 (1-10) | 8 (1) | 3 (1) | 21 (1-5) | 8 (3) |
| | F 32 | 41 (1-8) | 41 (1-2) | 31 (1-6) | 100 (1-9) | 6 (1-2) | 3 (1) | 88 (1-3) | 19 (1-3) |
| Belgaum | M 46 | 33 (1-9) | 7(1) | 43 (1-3) | 100 (1-20) | 7 (1) | 41 (1-4) | 24 (1) | 2 (1) |
| | F 24 | 42 (1) | 38 (1-3) | 38 (1) | 100 (1-6) | 8 (1) | 29 (1) | 83 (1) | 38 (1) |
| South Goa | M 34 | 50 (1-many¶) | 24 | 56 (1-many¶) | 100 (1-12) | 6 (1) | 29 (1-3) | 29 (1-3) | 12 (1-3) |
| | F 36 | 33 (1-3) | 11 | 39 (1-4) | 100 (1-7) | 11 (1) | 47 (1-4) | 67 (1-6) | 14 (1) |
| Namakkal | M 32 | 13 (1-2) | 6 (1-2) | 25 (1-2) | 100 (1-10) | 16 (2) | 0 | 9 | 0 |
| | F 38 | 11 (1) | 11 (1) | 29 (1) | 100 (1-10) | 3 (3) | 0 | 8 | 3 |

M: males. F: females.

*In addition, 2 men in Namakkal reported injection drug use; no one reported acupuncture.

†The first number is the percentage of people reporting the exposure; numbers in parentheses give the range of the number of exposures per person for those reporting the exposure.

‡Excluding piercing during childhood.

‖Including blood tests for HIV infection.

¶One person reported many treatments for cancer of the jaw.

Table 3.8 reports blood exposures in obstetric and gynaecological health care. In Sangli, 24 women reported 3 to 10 injections during their pregnancy and deliveries, most often before testing positive, though several women delivered after testing positive; 13 women reported 1 to 3 medical terminations of pregnancy, most often 1 to 5 years before

testing HIV-positive; 1 had curetting for primary infertility 2 years before testing positive.

In Belgaum, 11 of 24 women had children in the last 10 years, including 2 women who delivered at home 2 to 5 years before testing positive; women reported 1 to 12 injections during pregnancy. In South Goa, 21 women reported 1 to 3 deliveries in the last 10 years; women reported 1 to 20 injections during pregnancies; 4 reported medical terminations of pregnancy; one woman reported caesarian sections 6 and 9 years before testing positive. In Namakkal, 20 women reported 1 or 2 deliveries in the last 10 years and 3 reported medical terminations of pregnancy. In all 4 districts, some women delivered at home while others delivered in private nursing homes, public health centers, and government hospitals.

**Table 3.8: Blood exposures in obstetrics and gynaecological care**

| District | Number of women | Injections during pregnancy and delivery* | Deliveries* | | Medical termination of pregnancy* | Tubal liga-tion* | Gynaeco-logical problems* |
|---|---|---|---|---|---|---|---|
| | | | Total | Last 10 years | | | |
| Sangli | 32 | 75 (3-10) | 75 (1-4) | 56 (1-3) | 41 (1-3) | 25 | 38 |
| Belgaum | 24 | 71 (1-12) | 75 (1-5) | 46 (1-2) | 33 | 8 | 33 |
| South Goa | 36 | 61 (1-20) | 75 (1-5) | 58 (1-3) | 11 | 6 | 25 |
| Namakkal | 38 | 58 (1-3)† | 71 (1-3) | 55 (1-2) | 8 | 0 | 0 |

* The first number is the percentage of women reporting the exposure; numbers in parentheses give the range of the number of exposures per person for women reporting the exposure.

†This percentage includes one woman who reported injections for family planning.

In each district, we asked 50 respondents about whether they received counselling before and/or after HIV testing (see the 3rd and 4th columns in Table 3.9). In all districts, persons who tested at private laboratories and clinics did not receive counselling before testing, and many were not counselled after testing as well. However, some of the private clinics that specialized in treating PLWHAs provided counselling.

We asked all 70 respondents about the counsellor's attention to risk assessment. Across all districts, counsellors asked 62 percent of respondents about their sex history, but only 52 percent were asked about blood transfusions, only a third about minor or major surgeries, and less than a fourth about treatment for past illnesses. In short, counselling focused on sexual risks.

**Table 3.9: Counsellor's attention to respondent's risk exposures (percent of respondents)**

| District | Sex and number | Counselled* | | Counsellor asked about risks:† | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Before test | After test | Sex history | Blood Transfusion | Major or minor surgery | Medical care for past illnesses | Tattoos |
| Sangli | M 38 | 36 | 48 | 55 | 50 | 34 | 21 | 24 |
| | F 32 | 52 | 60 | 63 | 59 | 31 | 28 | 34 |
| Belgaum | M 46 | 55 | 55 | 65 | 52 | 39 | 35 | 9 |
| | F 24 | 62 | 67 | 67 | 54 | 29 | 21 | 4 |
| South Goa | M 34 | 50 | 42 | 53 | 41 | 12 | 6 | 6 |
| | F 36 | 63 | 63 | 72 | 44 | 17 | 3 | 0 |
| Namakkal | M 32 | 56 | 56 | 63 | 63 | 34 | 9 | 16 |
| | F 38 | 68 | 60 | 58 | 53 | 32 | 18 | 24 |

M: males. F: females.

*In each community, we asked 50 respondents about counselling before and after tests; all other information in the table is from 70 respondents in each community.

†Some were asked about their risks for HIV acquisition before tests and some after tests.

**Summary**

High percentages of PLWHAs reported a wide range of common blood exposures, including dental care, medical injections, blood tests, tattooing, and others. In many cases, these exposures occurred before individuals tested HIV-positive and may have been the route of HIV acquisition. In other cases, these procedures occurred after the individuals tested HIV-positive, and presented a risk for HIV transmission to others if infection control procedures were not adequate.

A majority of PLWHAs suspected that they were infected through sexual contact, including many women from husbands who tested HIV-positive. Some people with little or no possible sexual exposure to HIV may nevertheless believe that their infections are from sexual contact due to the common view that heterosexual transmission drives India's HIV epidemic. However, a substantial minority of PLWHAs had no idea how they became infected, while others suspected specific blood exposures during health care or cosmetic services.

During pre- and/or post-test counselling, counsellors asked about sexual behaviours, but paid less attention to blood exposures. This distribution of time and attention is consistent with and also encourages the view that HIV infections are almost always sexually acquired.

# Chapter 4
# Findings: Unexplained cases

Apart from interviewing PLWHAs, we tried to locate unexplained cases, i.e., HIV-positive people for which the routes of infection were either unclear, suspected to be through health care exposures, and/or definitely not through sexual exposures, IDU, or from an infected mother. We searched for cases through informants, i.e., people who worked closely with PLWHAs in VCCTCs, positive networks, NGOs, private clinics treating AIDS patients, etc. We accepted case histories (including assessments of the routes of transmission) from informants; where possible, we also interviewed the case or a parent for additional information.

**Box 1: A child with a suspected nosocomial HIV infection**

At the age of two months, in May 1999, this child was operated on for hernia repair at a private nursing home. Three months later he was admitted for meningitis at a government hospital, during which treatment included transfusion and injections. Beginning soon after, he fell sick repeatedly, lost weight, and was several times admitted to hospital.

In October 2002, aged 3 ½ years, he was tested and found positive for HIV. The parents subsequently tested HIV-negative. After learning of his son's infection, the father has been severely depressed and has been unable to support the family. The boy's mother has faced discrimination in the local hospital. Her difficulties in working with the local hospital are compounded by her belief that it was the source of her son's infection. With little support from the local medical fraternity in her state, she finally visited a doctor in Mumbai, who started her son on anti-retroviral therapy (ART). Her life for the past six years has been one long struggle. Financially and emotionally drained, her life revolves around keeping her son alive and well. It is only recently that she has received some moral and nutritional support from a local care home, and that her son has received free ART from the government (from July 2005). To date, no official organization has tried to trace the source of the child's infection or provided any compensation.

**Case finding**

In almost all situations across the four districts, the sources had come across at least one if not several cases of PLWHA whose infections could not be adequately explained. Typically, an informant's initial response to our search for unexplained cases was to say all the HIV-positive people they met were infected through the sexual route. It is only after probing that they spoke about the 'exceptions'. In most cases, the informant did not recall the details and had not attempted to investigate further. After all, 'there are only a few cases like these, most are sexual' was a common response. Since we did not have access to these cases either, we could not interview them. Because we do not have details, we do not report these cases here.

Informants also admit that they do not believe many PLWHAs who deny sexual exposures and who attribute their infections to medical injections and other blood exposures. Informants have, understandably, not reported such PLWHAs to us as nosocomial or unexplained cases.

**Box 2: A man with a suspected nosocomial HIV infection**

In September 2005, we organized a meeting in Belgaum to share the results of this study with about 30 local people, including members of an HIV-positive network. During the meeting, one of the men from the HIV-positive network spoke up on his own initiative to describe his own experiences. Earlier that month he had visited a government hospital in the district where he had received an infusion. When he noticed the nurse reusing infusion sets for several patients, he told her he was HIV-positive, and advised her to use new sets for each patient. We later interviewed him and asked why he had told the nurse his HIV-status, risking stigma and neglect. He answered, "That's how I got infected. I don't want to be responsible for someone else's infection." He went on to tell us that he was found HIV-positive in March 2005. He had received injections as an outpatient at the same hospital in 2000-2001 for cold, cough, and weakness, and had received IV fluids in 2002 for dysentery. During his first visit, the nurse had asked him to supply a syringe and needle; he said the hospital should provide, which they did. He was unaware at that stage of the risk for HIV in unsterile medical injections, and had faith in the government health care system. It was only after becoming infected and knowing more about HIV/AIDS that he recognized these exposures as risks for HIV infection. He reported no sexual encounters with anyone but his wife of 11 years, and his wife and daughters, aged 9 and 4 years, are all HIV-negative.

He also told us about a close friend from childhood who is HIV-negative but whose wife tested HIV-positive. He reported that it took him some time to convince his friend to stand by his wife, who was adamant that she had no other sexual partners. His own experience with HIV acquired from health care exposures was what convinced his friend that his wife's HIV may similarly be from a non-sexual route.

The cases that the informants reported to us were those where the informant had probed for sexual and other risks before concluding that HIV infections were nosocomial or unexplained. Informants had better recall for cases tested more recently. Interestingly, if one goes through the reports of the VCCTCs or hospitals reporting AIDS cases, these suspected nosocomial or unexplained cases are often not reflected in the data reported to the SACS. We discuss this in more detail in Chapter 7.

Tables 4.1, 4.2, and 4.3 below outline some details regarding suspected nosocomial and unexplained cases in women, men, and children, respectively.

**Table 4.1: Women with suspected nosocomial or unexplained HIV infections**

| Serial number | Age | When tested for HIV | Suspected route of infection | Additional information | Source of risk assessment |
|---|---|---|---|---|---|
| W1-S | 40 | May 2004 | >50 injections in last 5 years for fever and weakness; 2 tooth extractions | Husband HIV-negative | Referred by NGO; we also interviewed the woman |
| W2-B | 35 | Sept 2004 | Occupational exposure in a government hospital | Unmarried, no sexual history | Information from private doctor |
| W3-B | 30 | July 2004 | Unknown; received injections from local doctors | Husband HIV-negative | Information from private doctor |
| W4-G | 27 | 2000 | Ear-nose- and throat surgery at a private nursing home 2-3 years before testing positive | Not married; no sexual exposure. | Information from private doctor |
| W5-G | 34 | October 2004 | First admitted for arthritis in a private nursing home 7 years ago; many subsequent admissions for arthritis; frequent receipt of IV fluids and injections | Husband HIV-negative; no other sexual exposures | Information from a private doctor |
| W6-G | 36 | July 2003 | Source of infection unknown; caesarean in a private nursing home 13 years ago; medical termination of pregnancy 11 years ago | Husband HIV-negative; first two children (including child from caesarean birth) are HIV-negative; a 6-year old child is HIV-positive. | Information from a care and support center; we also interviewed the woman |
| W7-G | 42 | December 2003 | Cared for a sister with AIDS; had a medical termination of pregnancy in 1997/98 in a private nursing home; admitted for typhoid to a private nursing home, for which she received injections and IV fluids. | Husband HIV-negative; no other sexual partner; no sexual relations with husband for the last 5 years | Information from care and support center |
| W8-G | 64 | June 2004 | Hysterectomy at a private hospital in Mumbai in 1991, where she received 11 units of blood | Husband died in 1983; no sexual partners after husband died | Information from care and support center |

W: woman; S: Sangli; B: Belgaum; G: Goa

**Table 4.2: Men with suspected nosocomial or unexplained HIV infections**

| Serial number | Age | When tested for HIV | Suspected route of infection | Additional information | Source of risk assessment |
|---|---|---|---|---|---|
| M1-S | 17 at death in 2003 | July 2003 | Injections for hemorrhoids from local practitioner | No MSM or other high risk sexual behaviour | Private doctor |
| M2-S | 60 | December 2004 | While caring for his HIV-positive son, the son bit the father's thumb in October 2004 during an epileptic fit | | Information from NGO; we could not interview the case |
| M3-S | 62 | 2003 | Treatment for ulcers (operation, injections, infusions) at a government hospital in 1998 | Reported no sexual behaviour for past twenty years | The case introduced himself at a meeting with a positive persons' network; we later interviewed him |
| M4-B* | 32 | March 2005 | Outpatient injections at a government hospital in 2000-2001 for cold, cough, and weakness; IV fluids in 2002 for dysentery | Wife HIV-negative; married for 11 years, and has girls aged 9 and 4 years | The case introduced himself at a meeting with a positive persons' network; we later interviewed him |
| M5-G | 52 | October 2004 | Surgery for hemorrhoids with a blood transfusion in a private nursing home in 2002; accident-related admission to private nursing home; frequent treatment for abdominal pain | Wife HIV-negative | Information from care and support center. |
| M6-G | 55 | June 2004 | Surgery of the spine with blood transfusion, injections, and IV fluids in 1999-00 | Unmarried; no sexual relations with anyone for the last 30 years | Information from care and support center |

M: man; S: Sangli; B: Belgaum; G: Goa.
*Box 2 provides more information about this case.

Table 4.3: Children* with suspected nosocomial or unexplained HIV infections

| Serial number | Current age | Sex | When tested for HIV | Suspected route of infection | Additional information | Source of risk assessment |
|---|---|---|---|---|---|---|
| C1-S | 13 at death in 2004 | F | March 2002 | Multiple injections and other treatments for nasal discharge (cerebrospinal fluid rhinorrhoea) from age 2 years; later encephalitis, meningitis. | Mother HIV-negative | Information from NGO; we also interviewed the father |
| C2-S | 12 yrs | M | June 2003 | Frequent injections (unclear whether these precede or follow HIV infection) | Mother HIV-negative | Information from private doctor |
| C3-G | 13 | F | January 2004 | Admitted to hospital with fever of unknown origin in 2002; treatment included IV fluids | Mother HIV-negative; case tested to obtain visa | Information from private doctor |
| C4-G † | 6 | M | October 2002 | Operated on for hernia repair at a private nursing home in May 1999; admitted for meningitis at a government hospital 3 months later, during which treatment included transfusion and injections. | Mother HIV-negative. | Information from care and support center; we also interviewed the mother. |
| C5-G | 14 | M | 2004 | Unknown; sick from childhood and treated for different ailments at government and private facilities | Parents are HIV-positive but asymptomatic‡; a 6-year old sibling is HIV-positive. | Information from VCCTC; we also interviewed the mother |

*People who tested HIV-positive before age 15 years.
C: child; S: Sangli; B: Belgaum; G: Goa.
†Box 1 provides more information about this case.
‡ Although the mother is HIV-positive, we consider that mother-to-child transmission was unlikely because child survival and mother's survival without symptoms for 14 years are both highly unlikely.

**Constraints**

One of the limitations in obtaining this data was that some informants were not ready to give information regarding cases. It was usually the doctors who treated the patients who had greater recall. Counsellors at the VCCTCs and sometimes doctors in government hospitals had less recall as well as less authority to part with information. For instance, in Namakkal, we were informed that there were 59 discordant couples in the PPTCT programme, many of which could not be explained; there were also two children with HIV-negative mothers who seemed to have got infected through blood transfusion. However, we were unable to access any details of these cases. It was also difficult to meet and interview cases due to issues of confidentiality, or because the informant had lost contact with the case, or the case was no longer alive.

Often, it is the children with HIV-negative mothers who are suspected to have gotten HIV infections through nosocomial or unknown exposures. With most adults the sexual route is rarely entirely ruled out. We encountered several cases where the history of HIV-infected children points very clearly to procedures at one or more specific health care facilities. It is disturbing that these cases are not investigated for a variety of reasons – ranging from lassitude to fear of implicating the concerned facility.

Furthermore, we found no systematic or institutional arrangements to respond to cases. With no recording or investigation, cases go unrecognised and unacknowledged. Everyone involved acts as if each case is unique and rare, which is simply not so. Because of consistent efforts to deny the importance of nosocomial HIV transmission in India's HIV epidemic, those who are infected through these routes – the adults and children, and their parents – have been ignored. They are left without medical, financial, or even emotional support. Clearly redressal and compensation are many steps away.

# Chapter 5
# Findings: Blood exposures in health care and cosmetic practices

When infection control is not adequate in health care and cosmetic services, and when HIV has already entered into the population (through any route), vulnerability to HIV extends to all patients or clients of facilities where infection control is inadequate. In four districts, we identified and documented health care and cosmetic practices that represent a threat for HIV transmission.

High HIV prevalence in the four districts has been attributed almost solely to unsafe sexual practices. This is reflected in the district HIV and AIDS case surveillance reports submitted to the State AIDS Control Societies (SACS). Changes in HIV prevalence over time reflected in these surveillance reports have likewise been seen as a reflection of safer sex practices or increase in unsafe sex practices (depending on trends in prevalence). In keeping with our view that blood exposures contribute to HIV transmission, we consider that reductions over time in unsterile health care and cosmetic practices may have contributed to slowing the pace of HIV epidemic expansion.

## Awareness of HIV transmission through blood exposures

*Health care providers' awareness*

Among health care providers in the four districts, we found evidence of an increase in awareness in recent years about the need for standard precautions. Doctors reported they had become more conscious of safe and unsafe practices due to the HIV epidemic. Various organizations have promoted standard precautions to health care providers. The National AIDS Control Organisation (NACO) has developed training modules; the Indian Medical Association (IMA) and the Indian Dental Association (IDA) have circulated guidelines on standard precautions. In Goa, for example, the dental, medical, and nursing colleges have shifted from a couple of lectures on HIV/AIDS to a complete study of the disease, which is included in the curriculum of the department of Preventive and Social Medicine (PSM). Standard precautions are taught, discussed and increasingly practiced.

Many of the messages on standard precautions disseminated to health care providers through training programmes and modules have emphasised protection for health care providers, giving less attention to reducing patient-to-patient transmission. For example, a NACO document advises dentists to use gloves, and to change them between patients, or at least every several hours (which implies using the same gloves for multiple patients). While such advice protects the dentist, it leaves risks for patients.[1]

We found that health care providers' knowledge about HIV transmission risks in health care settings reflected the mixed messages given by medical textbooks and training modules. For example, the first two chapters (written by different authors) of an edited book provide widely differing figures on transmission risks through shared needles and syringes.[2] In all the areas we visited, we found that health care providers were

[1] NACO. Manual for control of hospital associated infections: standard operating procedures. New Delhi: NACO, no date.

[2] Baveja UK, Rewari BB (eds.). (2004). Diagnosis and Management of HIV/AIDS: A Clinician's Perspective. New Delhi: BI Publications.

misinformed about HIV survival in different conditions (e.g. in the bore of hollow needles and in multidose vials) and the transmission efficiency of HIV through unsafe health care and other blood exposures. Many providers believed that the virus lives no more than a few minutes outside the body (which was inconsistent with their recognition that transfusion of blood and blood products transmits HIV). Based on information from training manuals and other sources, they believed the risk of transmitting HIV from an infected patient to others through reusing syringes and needles without sterilization was very low, i.e. 0.3 percent. They were unaware that the risk is much higher, i.e. 2.3 percent for deep needlestick accidents and injections. Their misinformation on these points may have contributed to the continued lack of safety precautions being taken in many settings.

*Public awareness*

While Government and private AIDS prevention programmes have promoted public awareness of risk to transmit HIV through blood exposures, these messages have been diluted in the midst of safer sex messages. Moreover, messages about non-sexual risks have focused on blood transfusion and, to an extent, injections, especially intravenous drug use (IDU). Inadequate attention has been given to other invasive health care and cosmetic procedures. Hence, people are to an extent aware of unsafe injections as risks for HIV, but do not always generalize this risk to all blood exposures. We found that public awareness of risks to contract HIV through shaving and tattooing is low. Barbers and tattooists are even less aware of HIV survival and transmission risks than are health care providers.

**Practices that present risks for HIV transmission**

*A. Curative injections*

Irrational use of injections and infusions continues on a massive scale due to both patient demand and doctors' apprehensions that they may lose patients. Many doctors reported that the demand for injections was decreasing; but others said it was increasing, though people were more conscious about disposables. Similarly, people in the district provided conflicting information about trends for more or fewer injections.

Through discussions with doctors, and through assessing the sales reports from pharmacies and wholesale stockists, we observed a clear shift over the years in all study sites from glass to disposable syringes and needles. We found that people often purchase disposable syringes and needles prior to visiting a health facility; often doctors or nurses request the patients to bring syringes and needles, or prescribe these along with the injectable medications.

Some of the pharmacists we interviewed believe that fear of contracting HIV is only one of several reasons for the increasing demand for disposables. They suggested that other factors for this increase could be convenience (no boiling, packing, autoclaving etc.) and connections (commissions) between companies and doctors.

According to reports from government and private doctors, pharmacists and wholesalers, the shift from glass syringes to disposables syringes and needles occurred from 3 to 12 years ago in these districts. By and large the change is noticeable first in the urban areas and later in the rural areas. It seems to have occurred earliest in Namakkal, followed by Goa, then Sangli and Belgaum. In Sangli, for instance, only 5 years ago, 90

percent of the syringes sold were glass and 10 percent were plastic; whereas in 2005, disposables account for 98 percent of syringe sales.

In all the districts, we observed that glass syringes are still used in government health facilities, and that arrangements for sterilisation are questionable. Glass syringes also continue to be used in the private sector, especially among the doctors who were practicing well before the onset of the AIDS epidemic. For instance, in Belgaum, many doctors still use glass syringes. Although many government, charitable and private practitioners use disposable needles and syringes, we found many reports of doctors re-using equipment without sterilization, particularly in villages, peripheral areas, and marginalized communities.

Some health providers reported that they change the needle but reuse the syringe, even without sterilization. One educated woman in Namakkal who was treated for a centipede bite in a government hospital in 1995 reported seeing the same syringe and needle used for many patients. In one government health centre in Belgaum, the doctor, working under considerable odds, admitted that she reused the same glass syringe without sterilization and changed the needle for at least 3-4 women on the days fixed for ANC outpatients.

Discussions with pharmacists and doctors revealed that some poorer people buy only needles, but not syringes. Doctors also prescribe 'needles only' for those they believe cannot afford syringes. Syringes with questionable sterility are therefore reused. Sangli pharmacists are of the view that plastic syringes are still being reused after boiling. An HIV-positive woman in Namakkal reported that after administering an injection to her, the nurse in a health facility kept the disposable syringe and needle in a tray along with other syringes and needles. The following visit when she informed the nurse that she was HIV-positive, the nurse disposed of the used syringe and needle in a bin.

The state government supplies consumables and equipment to government hospitals and clinics. Staff of government hospitals and clinics in remote areas told us that they do not get sufficient numbers of disposable syringes and needles. In Goa, the nursing staff, paramedics and class IV workers said that the government supply is never adequate to ensure the use of standard precautions. A government hospital in Belgaum autoclaves and reuses disposable syringes. In Namakkal as well, government sub-centres and primary health centres do not receive an adequate supply of disposables; when people cannot afford to buy their own disposables, the centres reuse glass syringes (after sterilisation).

*B. Injections for immunization*

While health authorities have paid more attention to injection safety for immunizations than for curative injections, much remains to be done. Reports from Namakkal suggest that even a year ago syringes and needles were reused without sterilization during the immunisation camps in the rural areas. Glass syringes are still used in immunization in some areas, e.g., Namakkal, whereas most areas have shifted to disposable syringes and needles. The immunization programme in Goa has very recently shifted to auto-disable (AD) syringes, which break after one use.

While most immunizations are for children, women are advised to receive 2-3 tetanus toxoid injections during pregnancy, which is common. Moreover, men, women, and children often go for tetanus toxoid injections after injuries.

*C. Multidose vials*

Multidose vials are commonly used for injections; anesthetics are available only in multidose vials. Common reuse of injection equipment enhances risks of HIV transmission through multidose vials. Anesthetics are particularly dangerous, due to the occasional need for additional doses during individual procedures and the lack of awareness among health care providers about virus survival in multidose vials.

Wholesalers in Sangli reported that the number of multidose vials sold has almost tripled in the past 5 years; commonly used multidose vials include local anesthetics and analgesics. Of the total injectables sold by pharmacists, 90 percent are multidose vials and 10 percent are single dose ampoules. In Goa, wholesalers and pharmacists informed us that the demand for multidose vials increases by at least 20 percent every year.

*D. Intravenous (IV) saline*

In all the four districts, pharmacists and wholesalers told us the sale of saline kits and bottles has increased steadily over the years. Where home remedies or oral rehydration salts were previously promoted, the first choice in recent years has become IV fluids. This is particularly true in rural areas where private practitioners (often unqualified) routinely administer IV fluids to patients, irrespective of need. In Sangli, the sale of IV saline bottles has increased in the last 2 to 3 years but the sale of IV sets and scalp vein needles has not increased proportionately, suggesting possible reuse of IV sets. Private clinics buy large numbers of bottles of saline. In Namakkal, we found that IV fluids were administered without scalp vein needles; the needle included in the IV set was used.

People we interviewed reported reuse of IV sets without sterilization both in the government and the private sector. One man who attended a government clinic in Belgaum District in September 2005 observed the same IV sets being reused for patients; he informed the nurse that he was HIV-positive so that she would not reuse the set. He explained that he was motivated to do so because he believed he was infected through unsterile procedures at the same facility, and he did not want to pass on his infection to others the same way.

*E. Health camps*

Most health camps cater primarily to the poorer people in the community. Local NGOs such as Lions' Clubs, etc., often help to run the camps. We heard reports that eye camps for cataract surgery may also be reusing equipment with the belief that there is no exposure to blood or infectious fluid during such surgeries. This may need further attention.

The government's family planning programme organizes camps with targeted numbers of tubal ligations to be performed at each camp. In such camps, laparoscope(s) are reused. The formalin tablets used to sterilize laparoscopes require twenty minutes for complete sterilization. Given the number of cases operated in a camp, doctors may not allow enough time between cases to sterilize laparoscopes. Doctors in Sangli admitted that sterilization of instruments was a concern during the camps and that it was not always possible to ensure sterile equipment. The guidelines provided by the Ministry of Health regarding the numbers of laparoscopes and operations allowed per day during

camps (not more than 25 surgeries for 1 doctor with 2 laparoscopes) appear to allow sufficient time to sterilize laparoscopes, but observers report that these guidelines are often not followed.[3]

*F. Blood banks*

Due to changes in regulations and institutions, particularly after the Supreme Court's 1996 ruling, safety of blood transfusions is one area where considerable success has been achieved. However, regulations are not always followed, and some risks remain.

We found cases where people have been infected through blood transfusions (Chapter 4). Even where necessary precautions are taken, risks continue with the window period and the use of untested blood in emergencies. In high prevalence districts, the risks are likely to be greater, especially where screening of donors is inadequate. For instance, in a meeting in Belgaum, two FSWs from the state of Karnataka informed us that they donate blood regularly.

Health providers in the districts acknowledged that professional donors continue to sell blood either as replacement donors or directly to blood banks. It is difficult to stop professional blood donation, as it is in the interests of both professional donors and private blood banks to continue their business relationship. We also met people who reported that they had sold their blood to private blood banks over the last few years. It is unclear about how private blood banks are supervised – by SACS, State Blood Transfusion Councils, and/or FDA. The SACS officials we interacted with regarding safety of blood at blood banks admitted that there were problems with the private banks, but felt it was not within their purview to address these. Apart from the NACO guidelines on standard precautions in the blood banks, there is no rule enforcing blood banks to use disposable equipment.

*G. Blood tests*

In malaria endemic areas, government health workers visit localities to test all residents. During these tests, residents of a slum area in South Goa reported that health workers reused a single lancet without sterilization to prick several people. After we received this information from FSWs, we met with current and former state health officials, who confirmed that unauthorized reuse of lancets without sterilization has been a concern for years. During subsequent discussion about risks from unsterile finger-pricks, a senior health official cited information from the Indian Council of Medical Research delivered to an interstate meeting of health officers that lancets penetrate deep enough to reach peripheral capillaries only, so that reused lancets do not transmit HIV, though they might transmit other bloodborne viruses. This is dangerous misinformation.

*H. Dental care*

We found that dentists serving the wealthier sections of the community seemed to be using standard precautions in their clinics. However, several dentists we visited who appeared to have poorer clients did not have enough instruments to use a separate set for each patient, while sending used instruments for sterilization. For example, one dentist in

[3] Ramachandran, V "Reporting on post-Cairo changes: Quality of care in laparoscopic sterilisation camps" Indian Journal of Medical Ethics, Vol. 7, No.4, Oct-Dec 1999.

Namakkal who reported about 50 patients per day from 9.00 a.m. to 2.00 p.m. apparently had only one set of instruments and a dusty autoclave lying in a corner on the floor. Many poor people do not visit dentists; when dental care is required they go to the nearest general practitioner, often for tooth extraction with local anesthetic.

*I. Medical waste disposal*

In many areas, the IMA organizes weekly collection of medical waste, which they burn in their own incinerator. Some private doctors told us that they disposed of their medical waste in incinerators owned by other doctors in the locality; they had contractual arrangements with these doctors. In Sangli, some clinics use a needle burner, and keep plastic waste and other medical waste separately; the latter is incinerated. Most large government hospitals have their own incinerators, but at rural sites, medical waste is often disposed through makeshift arrangements.

Many private practitioners who do not belong to the IMA and cannot afford an incinerator routinely dump medical waste in the common garbage bin, on open grounds, or in pits. Many government facilities, especially in the rural areas, do the same.

In South Goa, apart from the doctors who treat AIDS patients routinely, most private clinics do not have needle destroyers or shredders. In one government hospital in Belgaum, used disposable syringes are thrown into a bin which is emptied in an open area at the back of the hospital near a residential area where children play. Waste is burned in that same area. Many private doctors, particularly in peripheral areas, were not aware of regulations for medical waste management. However, it also seems that there is a lack of interest among some doctors to follow the regulations, since it would be costly. In South Goa, there is no municipal facility for disposal of medical waste.

*J. Other invasive procedures*

Women in Namakkal reported that a government doctor running his private practice on Sundays conducted medical terminations of pregnancy (MTPs) on large numbers of women without sterilizing instruments between patients. We did not directly observe infection control practices during major and minor surgery and other inpatient procedures.

*K. Cosmetic practices: shaving*

Most of the barbers we interviewed had some idea about HIV/AIDS, but some appeared not much worried about HIV transmission through reused shaving instruments. In all the districts, barbers seem to have given up using fixed razors 7 to 10 years ago. They now use tools designed to hold half-razor blades; they break razors in two, using a half blade for each customer. All of the barbers we spoke with reported that they used new half blades for every customer. However, on closer examination, some did not have enough blades, or could not show disposed blades.

*L. Cosmetic practices: tattooing*

The practice of tattooing at fairs and festivals is common in rural Sangli, Belgaum and Namakkal Districts, as well as in urban slum areas during the festival season, when tattooists come from the rural areas. In such settings, people commonly queue up for tattoos, which tattooists provide without changing needles or inkpot between customers.

In rural Namakkal, the arrival of a tattooist in a village is announced in advance, and all those who want tattoos gather around the tattooist, who then performs his artwork without changing the needles or the inkpot between customers. This practice continues to date.

Tattooing is sometimes done by hand, and sometimes with a machine, but with both of these technologies, needles and inkpots are routinely reused from one client to the other without sterilization or even cleaning. (In North Goa, outside the study area, we found that tattooists catering to foreign tourists used new needles for each customer, but we found no evidence of this practice in the four study districts).

*M. Cosmetic practices: piercing*

One informant reported that in various parts of Tamil Nadu, which presumably includes Namakkal, ear piercing is done at ceremonies where the person responsible for piercing tests the needle on his own finger; if it bleeds he uses the needle to pierce the client.

*N. Exposures in the family*

Not much has been done to address blood exposures within the family unless the persons are known to be HIV-positive and have been counselled or are members of networks where they have been trained in safety precautions in the home. Razors are often shared between spouses or other family members. In discussions with the medical community, we found that some health professionals were disinclined to educate people about these risks for fear of 'frightening' them.

**Summary: better but still not safe**

These findings throw light on some of the non-sexual exposures that people in the district have which may contribute to HIV acquisition and spread. There is no attempt here to attribute HIV to one exposure or another.

An increased awareness about HIV over the years has resulted in many service providers adopting safer practices to reduce the possibility of virus transmission. Most of these changes that have taken place within the community go unrecognized and have not been credited with impacting HIV epidemic trends. Even doctors who clearly see a change in health practices (their own and others) over the years do not see the connection between these changes and possible reduction in HIV incidence. Reduction in HIV prevalence or incidence is always attributed to increased awareness on safer sex and increased condom use.

While surveillance reports link HIV to unsafe sex practices, reports often show low STI prevalence in communities with high levels of HIV infection. In Sangli for instance, syphilis, gonorrhoea, and chancroid have almost disappeared; STIs are limited to pelvic inflammatory disease (PID), burning micturition, and white discharge. But high HIV prevalence in ANC clinics suggests that HIV incidence remains high.

There is much that remains to be done. There are still many doctors (including unqualified ones) who do not follow standard precautions. Doctors reported that those who have been treating people with HIV/AIDS routinely take precautions. There is still a tendency to follow standard precautions for some patients but not for all, based on preconceived notions about who may or may not be HIV-positive. There are doctors of

Indian systems of medicine who dispense allopathic drugs and are the preferred option among the poor. Many of these health care providers are unaware of standard precautions to ensure that they do not transmit bloodborne pathogens to patients.

# Chapter 6
# Findings: Blood exposures of vulnerable communities

The first HIV infection in India was identified in a female sex worker (FSW) in Chennai in 1986. In subsequent years, based on observations in India and in other countries, AIDS programmers identified certain groups to be vulnerable to HIV infection due to high-risk behaviours. Initially, the communities in India that were considered to be vulnerable were limited to FSWs, intravenous drug users (IDUs), and men who have sex with men (MSMs). Subsequently, AIDS programmes began to identify other groups as vulnerable, including migrant labourers, truck drivers, and street children, and to target these groups with interventions through NGOs.

Rhetoric about vulnerability notwithstanding, people in these groups, except perhaps for street children, are largely considered to be responsible for unsafe sexual and IDU behaviours. Although AIDS programmes often recognize that circumstances force people into high-risk behaviours, most prevention programmes targeting vulnerable communities are built around the assumption that people can control their risk for HIV by changing their behaviour. Notably, most HIV prevention programmes among vulnerable communities have paid little attention to the risks they face through the behaviours of others, including especially health care professionals who provide unsterile injections and other unsafe care.

The handful of studies among vulnerable communities in India which have asked about blood exposures (except IDU) as risks for HIV have found evidence for HIV transmission through medical injections and tattoos. For example, a study of risks for prevalent HIV among FSWs in Tamil Nadu in 2003-04 reported only 3 percent (1 of 33) HIV prevalence among FSWs with no injections in the last year, but 16 percent (5 of 31) HIV prevalence among FSWs with 6-10 injections in the last year[1] (chapter 1 discusses other relevant studies). In reporting these results, the AIDS Prevention and Control Project (APAC) recommends that[2] "high-risk non-sexual behavior like multiple injections…use of non-disposable needles…and tattoos…can contribute to the spread of HIV and hepatitis B…and must be targeted in the prevention programs."

## FSWs

*Access to health care*

FSW access to health care is limited by the discrimination they face from the staff at some health facilities, including government facilities. The private sector offers a range of expensive to low-cost care; most FSWs rely on low-cost private care. Some private providers exploit FSWs due to the latter's lack of access to alternate health care. Brothel-based FSWs are particularly vulnerable to exploitation by health care providers because *gharwallis* (brothel keepers) arrange for their health care from specific doctors. In Baina, a red light area in South Goa, a well-organised *gharwalli*-doctor nexus exploits FSWs. These doctors assess unreasonably high charges for health care services, which are added to the debts that FSWs owe to *gharwallis*.

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[1] AIDS Prevention and Control Project (APAC). Prevalence of STI among Women in Prostitution. Chennai: APAC, no date.

[2] Ibid., p 23.

Aside from high charges, gharwalli-approved doctors may be dangerous to FSWs. FSWs in Baina report that a *gharwalli*-approved doctor reused IV sets without sterilization; the IV set was fixed to a stand, and for each new patient a new saline bottle was connected to the reused set. Unsterile health care administered by *gharwalli*-approved doctors may at least partially explain higher HIV prevalence among brothel-based FSWs than among FSWs working independently (as reported by an NGO working in Baina).

*Invasive health care procedures*

Due to the nature of their profession, FSWs access health care for repeated abortions and gynaecological problems, often under unsafe conditions. They also receive many injections for STD treatment and prevention, weakness, and other reasons. FSWs commonly seek STD treatment from private practitioners, and only for severe cases do they go to government STD specialists.

In Sangli, the FSWs we interviewed said they had received many injections (average of 20) in the past five years for various illnesses. This was corroborated by a doctor who is popular among FSWs, who said that they demand injections for quick relief. He commonly injects analgesic and multivitamins for an average of 4-5 FSWs each day.

During a focus group discussion in Gokak, Belgaum District, with FSW representatives from different parts of Karnataka, some FSWs expressed their belief that tablets can lead to kidney failure or eye weakness, and that injections are better and more powerful. In the same meeting, FSWs reported that doctors and nurses in government hospitals often change the needle but reuse the syringe without sterilising. As one FSW explained, "The doctor says that hundreds of patients come here every day. I can't change syringes for every single patient." In the same meeting, two FSWs reported that they donate blood regularly.

Informants in Namakkal reported that FSWs visit unqualified practitioners and RMPs for STD treatment, and that unsterile care is common. Informants also reported that FSWs take penicillin injections prophylactically (i.e., repeated injections over time to prevent STDs), and that health care providers treat FSWs who complain of discomfort or irritation in the genital area with penicillin injections. Most often, it is the RMPs who administer penicillin injections. (A recent study describes unsafe practices among RMPs in South India[3].)

*Tattoos*

Tattooing is common among FSWs. Of particular note is an annual festival at Saundatti in north Karnataka which is celebrated to honour the goddess Yellama, to whom many FSWs are dedicated as *Devdasis,* or "servants of God." *Devdasis* were formerly temple prostitutes, but are currently trafficked under the guise of "religious dedication." The festival is frequented by *Devdasi* girls and women from Karnataka and neighbouring states. Tattooing is very common at the festival, and the women wait in long queues for their turn. The tattooists change neither the needles nor the inkpot between clients.

[3] Lakshman M, Nichter M. Contamination of medicine injection paraphernalia used by registered medical practitioners in south India: an ethnographic study. Soc Sci Med 2000; 51: 11-28.

*Knowledge of blood exposures as risks for HIV*

FSWs in Karnataka and South Goa very clearly were uninformed and misinformed about risks to acquire HIV through blood exposures. During a focus group discussion in Gokak, Belgaum District (mentioned above), a large group of FSW representatives from Karnataka were surprised to hear that HIV can survive for hours or days – not seconds or minutes – outside the body. Although FSWs are targeted for HIV prevention programmes and messages, most of these programmes have clearly not informed – or even misinformed – women about risks for HIV acquisition through blood exposures that are common among FSWs, such as injections and tattoos.

However, we observed at least one situation where FSWs had been effectively educated about the importance of safe injections. In Sangli, one doctor who is popular among FSWs reported that they insisted he use disposable syringes and needles when giving them injections. Although he was reluctant to do so, accommodating FSWs' demands that he use disposable syringes and needles helped him over time, as it reassured his other clients that they were not going to receive injections with equipment contaminated through prior injections administered to FSWs.

**Truckers**

*Invasive health care procedures*

Truck drivers take many injections for STDs, weakness, and other conditions. Government and private doctors, pharmacists, and truckers reported that truckers in Namakkal often visit RMPs for penicillin injections after unprotected sex to prevent STDs. These injections are credited with reducing STD prevalence. Although the allopathic doctors whom we contacted did not admit administration of prophylactic injections, pharmacies reported that certain doctors routinely prescribe penicillin. To treat STDs, truckers in Namakkal visit unqualified practitioners; if symptoms persist, they go to private doctors, and then to government health facilities.

*Tattooing*

Tattooing is common among truckers. In Namakkal, truckers reported that "gypsies" from rural areas occasionally visited towns to offer tattooing services. The tattooing was unhygienic; needles were either reused or put in pans of warm or tepid water between use for different clients.

**Migrant communities**

Cities and districts across India contain communities that are identified as migrants. Although people may have lived for years in these communities, they continue to be identified as migrants. Migrant communities are characteristically comprised of relatively poor labourers concentrated in low wage and stigmatised jobs. For example, most of the residents of the Baina slums, South Goa, including FSWs, are recognized as migrants.

Because of their poverty, lower class identification, and position as outsiders, migrants often face discrimination in government services, including health services. Migrant communities often rely on private and informal health care providers who belong to or specialize in services to the community. For example, migrant labourers in South

Goa visit local practitioners, many of whom are not qualified. Migrants and lamanis (gypsies) who serve the tourist trade access *vaidjis* from their native villages, who can give them treatment at the beach

During a focus group meeting with FSWs and others in Baina, residents reported instances of unsterile health care from public and private facilities. They reported, for example, that a government clinic was using one syringe to administer BCG vaccine to every five children. Residents also reported that a foreign private doctor conducts annual camps in slum areas (including the former red light area), providing free hepatitis B and meningitis vaccinations to children, and offering toys as incentives. Residents reported that they observed the doctor reusing syringes and needles without sterilization; some, who were aware of risks, did not send their children for toys and free immunizations.

In malaria endemic areas, government health workers visit localities where cases have been reported to take finger-prick blood from all residents. Sex workers in Baina reported that health workers used a single lancet to prick several people, with no attempt to clean the lancet between tests. Health workers drew blood from children without waiting for permission from parents; hence, mothers who were aware of infection risks but happened not to be at home were unable to protect their children.

*Rag pickers' risks from medical waste*

Systems for disposing medical waste are inadequate in all four districts. Rag pickers who go through public trash are at risk to contract HIV and other bloodborne infections. These rag pickers usually belong to migrant communities. (The risk to transmit HIV to patients through recycled – collected, cleaned, and repackaged – needles and syringes is questionable because of the time and procedures involved in recycling; however other pathogens must also be considered).

**MSM**

In Goa, we had detailed discussions with MSM, some of whom were HIV-positive. MSMs recognize that they are stigmatised due to their sexual orientation, and that stigma limits their health care options, particularly to treat anal STDs, and even more so if they are HIV-positive. However, they were not interested to consider the possibility that unsafe blood exposures could contribute in any way to their risk for HIV infections. They were convinced that their risk for HIV was solely through sexual exposures. The MSMs with whom we talked belonged to a network that receives financial support to promote sexual behaviour change for HIV/AIDS prevention. Just as for other vulnerable groups, the almost exclusive focus on HIV transmission risks through sex may have contributed to MSMs' lack of awareness about non-sexual and non-IDU risks, and may perhaps limit their options to explore these other routes.

**Issues common to vulnerable communities**

Lack of awareness about the links between unsafe blood exposures and HIV is one of the factors that puts vulnerable groups at risk. However, even when they are aware of the risks they may not be in a position to negotiate for safe health care. Apart from the common belief that the "doctor knows best," the inequality of the doctor-patient relationship, and the patient's often limited access to alternate providers can make it extremely difficult for patients to even question the doctor's practices, leave alone

demand safe care. The practical choice is often between unsafe health care and no health care. As an FSW from Baina said "We have not noticed if the doctor uses the same syringe. Anyway, we have no choice. We take whatever the doctor gives us… If we refuse, where else can we go? Not many doctors are willing to treat us." When we told FSWs and others from vulnerable communities about risks to contract HIV from unsafe health care, some people said they would attempt to negotiate with their doctors, while others expressed helplessness.

Groups which are considered vulnerable due to their personal behaviours, viz. FSWs, IDU, MSM, truckers, and migrant labourers, are the same groups that are marginalized by mainstream society. Because of limited research into health care and cosmetic risks for HIV transmission, we do not yet have a clear idea about the relative contribution of blood and sexual exposures to the spread of HIV in vulnerable groups. In this study, we have found that vulnerable groups face greater non-sexual risks than do the general population. From the evidence collected in this study, we cannot attribute HIV infections to one exposure or another. However, the evidence shows that members of vulnerable communities are at risk for HIV through blood exposures due to the high prevalence of HIV among people attending the health care and cosmetic facilities serving vulnerable communities.

# Chapter 7
# Findings: AIDS case surveillance

The most widely quoted estimates of the proportions of HIV infections from various routes of transmission in India come from NACO's AIDS case surveillance system. NACO's figures for cumulative AIDS cases through July 2005 report that 86 percent of HIV infections in AIDS cases have been from sexual exposures, 2.4 percent from IDU, 2.0 percent from transfusion of contaminated blood and blood products, 3.6 percent from mother-to-child transmission, and 6.0 percent from other or not specified risks.[1]

To assemble these figures, NACO asks hospitals and institutions across the country to assess and report the route of HIV acquisition for in-patients with AIDS. These institutions report to the relevant State AIDS Control Society (SACS), which reports to NACO. Because AIDS case reporting is not mandatory, the SACS collect information from only those hospitals and other institutions that are willing to cooperate. In many districts, only 1 or 2 government hospitals report. In some states, a few private hospitals and/or other institutions report. There are still some districts and states in the country which do not report AIDS cases.

**AIDS case reporting hospitals and institutions in four study districts**

In August 1986, Maharashtra was one of the first Indian states to establish AIDS case surveillance. Excluding Mumbai, 38 hospitals in Maharashtra's 35 districts report AIDS cases. In Sangli District, the only health facility reporting AIDS cases to the Maharashtra State AIDS Control Society (MSACS) is the Civil Hospital. Through May 2005, 2,606 AIDS cases have been reported from Sangli District.

Two of the 16 reporting hospitals in Karnataka are in Belgaum District, including the District Hospital and the Karnataka Lingayat Education Society (KLES) Hospital, a 1,000-bed private hospital. In 2002 and 2003, the District Hospital reported 188 and 257 cases, and KLES reported 205 and 180 cases, respectively. From 1987 to August 2004, 810 AIDS cases have been reported from Belgaum.

Due in large part to Goa's relatively small population, only 653 AIDS cases have been reported from Goa from the start of surveillance to June 2005. In South Goa, seven institutions report AIDS cases, including 5 government hospitals, a private hospital, and a Community Care and Support Center. Most of these institutions began reporting in the last 5 years.

Tamil Nadu along with Maharashtra has been in the forefront of AIDS programmes in India, including surveillance. Through August 2003, Tamil Nadu's cumulative total of 32,909 reported AIDS cases, including 9,000 from Chennai, accounted for 45 percent of India's reported cases. Namakkal District reported 1,884 and 2,451 AIDS cases during 2003 and January to August 2004, respectively. Namakkal's reports come from the Government Hospital at Namakkal and from the Tambaram Hospital in Chennai. Tambaram Hospital, which treats AIDS cases from across the state,

[1] NACO: Facts & Figures, Monthly updates on AIDS (31st July, 2005) www.nacoonline.org/facts_reportjuly.htm accessed 11th October 2005

reports cases along with their addresses, so that Tamil Nadu State AIDS Control Society (TANSACS) is able to assign cases to their district of origin.

**Table 7.1: AIDS case reporting institutions in four study districts**

| State | District | AIDS Case reporting hospitals | Remarks |
|---|---|---|---|
| Maharashtra | Sangli | Sangli Civil Hospital | |
| Karnataka | Belgaum | 1) District Hospital<br>2) Karnataka Lingayat Education Society (KLES) Hospital | 2) is a private hospital |
| Goa | South Goa | 1) Hospicio Hospital, Margao<br>2) T.B. Sanatorium, Margao<br>3) Marmugoa Port Trust Hospital<br>4) INS-Jeevanti, Vasco<br>5) Cottage Hospital, Chicalim<br>6) Salgaokar Medical Research Center, Vasco<br>7) Asro Community Care and Support Center, Cavelossim. | 6) and 7) are non-government reporting facilities.<br>7) is supported by the Goa SACS. |
| Tamil Nadu | Namakkal | Government Hospital | TANSACS also gets reports from Tambaram Hospital, Chennai regarding AIDS cases in Namakkal |

**AIDS case reporting formats (Appendix D)**

In order to obtain data from the States, NACO has developed monthly AIDS case surveillance reporting formats, which the SACS distribute to hospitals reporting AIDS cases. The current format asks hospitals to assign adults with AIDS into one of five risk/transmission categories: sexual, transfusion of blood and blood products, infected syringes and needles, others, and not specified; while the four categories for children are mother-to-child, transfusion of blood and blood products, others, and not specified.

Some SACS continue to use an earlier NACO format, which offered seven categories for all ages: heterosexual, homosexual, blood and blood products, syringes and needles, mother-to-child, others, and not specified. It is unclear how NACO consolidates the data from these two formats. At least as late as December 2004, TANSACS' monthly reports included the categories "homosexual" and "heterosexual promiscuous." (The designation of the heterosexual category implied that all persons who had been infected by heterosexual partners had been promiscuous.)

Some of the risk/transmission categories in NACO's current reporting forms ask for information on high-risk behaviours. Specifically, the categories mother-to-child and injection drug use describe high-risk exposures. When an AIDS patient reports one of these exposures, it is reasonable to suppose that their infection has been acquired through that route. The category 'transfusion of blood and blood products' also clearly suggests a high risk exposure. However, with the emphasis on blood transfusion safety, the probability of getting infected through that route has reduced. It would be reasonable to

assign an AIDS case to the category 'blood transfusion' if high-risk sexual exposures and IDU have been ruled out. Consequently, when doctors* or counsellors identify any of these three exposures, and assign AIDS cases to these categories, the information reliably characterizes routes of transmission.

On the other hand, information about risk and about route of transmission is much less specific and less reliable for cases assigned to the sexual risk category. In the first place, the formats do not allow counsellors to differentiate between AIDS cases with high and low risk sexual exposures. For example, MSMs are at high risk for HIV acquisition through anal sex; hence, when a man with AIDS reports MSM behaviours, it is a reliable indicator of the source of his infection. Moreover, heterosexual exposures can also be objectively differentiated into low and high risk exposures. For example, when someone reports that their spouse or other heterosexual partner has tested HIV-positive, this is a good indication that heterosexual transmission has occurred (either to or from the spouse). In other words, current formats – which do not include categories for MSMs and for persons with HIV-infected heterosexual partners – do not allow counsellors to report information about specific high-risk sexual behaviours that would reliably indicate the source of HIV infections for AIDS patients.

Second, the format comes without rules about what risk category to assign AIDS cases to when they have low risk heterosexual exposures as well as blood exposures through health care or cosmetic services. In such cases, the formats in effect encourage counsellors to use their judgment, and to report their best guess about the source of the infection. In other words, aside from the high-risk categories (IDU and mother-to-child), NACO's formats ask that counsellors report their opinions about heterosexual behaviours and risks rather than objectively pass on what they learn about the specific sexual and other exposures that AIDS cases report.

While both old and new formats include a category for 'syringes and needles,' neither format has a separate category for IDU. We found that the category 'syringes and needles' is viewed in different ways. Most people believe it refers to IDU, but a few felt it referred to medical injections. Notably, 'syringes and needles' is not a risk category for children in some formats, which implies that the category for adults applies especially to IDUs. Counsellors collect and report information from AIDS patients according to the counsellors' understanding. However, consolidated data at the national level refers to IDU, with no mention of medical injections. In effect, cases which reporting hospitals have specifically attributed to unsafe medical injections are 'statistically' lost in national data, and assigned instead to IDU.

NACO's formats have no category for other parenteral routes, although it is acknowledged that HIV can be transmitted through a wide range of unsterile practices during invasive medical procedures as well as through tattooing, shaving, and other invasive cosmetic procedures.

There is no system or space on the formats to facilitate probing into the category 'others.' Therefore, while doctors sometimes suspect that specific AIDS cases have been acquired through known other routes of transmission, they have no place to record this

* Though doctors usually conduct the risk assessment in AIDS case reporting, in some cases counsellors from the VCCTCs are expected to assist. As risk assessment is seen as part of a counselling process, when referring to AIDS case reporting the term counsellor is used to refer to any person who is responsible for risk assessment i.e., the doctor or the counsellor.

information. Not surprisingly, this category represents a fairly significant proportion of cases. For example, the category "others" accounted for 6.3 percent of AIDS cases reported from KSAPS during 1987-2004. In Sangli in 2002, 14 percent of AIDS cases were classified as others.

The category 'not specified' is lumped with the category 'others' when the monthly data is consolidated either at the State or National level, though the reporting formats sent to the hospitals have separate categories for both. Also, it is unclear whether the category 'not specified' reflects an inability to get adequate information from the AIDS case, or lack of interest and effort to get the information.

The pattern of consolidating or lumping together various categories (e.g., medical injections and IDUs, heterosexual and homosexual, others and not specified) as information moves from the hospital to the national level further dilutes and misrepresents the information that has been collected when it is finally reported.

**Hospital management of risk assessment**

Within the hospitals, hospital authorities are responsible for deciding how to collect information for AIDS case reporting. We found no standardised systems for hospitals to collect information on the routes of transmission.

For example, in the Civil Hospital, Belgaum, hospital staff take and record case histories when patients are admitted. Inpatients suspected to be HIV-positive (due to symptoms or suspected risk behaviour) are sent to the VCCTC for counselling and testing. For non-ambulatory patients, staff in the wards collect and send blood for testing, and counsellors visit the wards for counselling. However, counsellors are not always able to meet patients. As one doctor explained, if a patient is admitted in late evening and discharged the next morning, doctors would take the personal and medical history. When patients are unconscious, doctors take histories, even sexual histories, from relatives. After the patient is discharged, the hospital records section collects information and reports to KSAPS. Information from doctors regarding the clinical management of AIDS cases goes into these reports, but we were unable to determine how or whether the counsellors' risk assessments are incorporated.

In the Civil Hospital at Sangli, nurses of the respective wards provide data on inpatient AIDS cases. The Sexually Transmitted Infections (STI) officer in the hospital collects the data and prepares a monthly report. The report goes to the Civil Surgeon for approval, and is then submitted to the MSACS. When reports are not forthcoming, the STI officer visits the wards and checks the rosters. If he suspects an AIDS case, he explores further by talking to the nurses in the ward. Even so, the STI officer may not be able to find all inpatient AIDS cases known to hospital staff, and some reports may be duplicates. In the Civil Hospital, all children with AIDS who are less then 10 years old are reported to have acquired HIV from their mothers, while with adults the sexual route is the default category.

In Asro Care and Support Centre, South Goa, the project coordinator collects information from clients. There is no deep probing into client history. Many who stay at the center say they have acquired HIV through sexual contact; for others, sexual risk is assumed. There are no attempts to look into other possible routes. HIV-positive children are assumed to have acquired HIV from their mothers, as most mothers are HIV-positive.

The Government Hospital at Namakkal has a separate "AIDS ward." All inpatients known to be HIV-positive are sent to this ward. The doctor in charge of the ward registers inpatients with the help of the duty nurse and sometimes the VCCTC counsellor. The VCCTC counsellor counsels the patient, assesses risk, and maintains her records. The counsellor and medical officer report to the medical superintendent who reports to the TANSACS.

**Lack of training for counsellors and doctors to assess routes of transmission**

AIDS training programmes for State Epidemiologists and District Nodal Officers focus on detection and clinical diagnosis of AIDS cases. Limited efforts have gone into training those responsible for AIDS surveillance on how to collect data on the routes of transmission. Most of the doctors in AIDS case reporting hospitals who collect information on routes of transmission have received no training on how to do so. Doctors we talked with believed they did not need training, because "history taking" is something with which they are familiar. In addition, many VCCTC counsellors have no formal training; nor are they given refresher training in the use of new formats whenever these are developed and introduced.

The SACS officials we spoke with see no need to train doctors to collect information on risks, because the "formats are self-explanatory." At the same time, these officials complained about the irregular reporting from the hospitals, including occasional absence of information on routes of transmission.

Without training in risk assessment, doctors and counsellors assign risks based on whatever information – or misinformation – they already have about HIV transmission efficiencies through sexual and blood exposures. We found many doctors and counsellors to be misinformed about the ability of HIV to survive for hours outside the body. This misinformation is one of the possible reasons for the lack of attention to parenteral risks in VCCTC and AIDS case reporting.

**Risk assessment in practice**

In the hospital setting, counselling and risk assessment for AIDS inpatients is subject to some practical difficulties. Privacy can be a problem for patients that are bedridden. In such cases, the challenge to interview patients in crowded wards very likely influences patients' willingness to talk about risk behaviours. Moreover, for AIDS cases, the information that is available to determine the source of their infection is generally limited to patient recall. Due to the long time lapse – often five to fifteen years – from the date of infection, and with current illness, patients may have trouble recalling all relevant exposures.

From observation of counselling sessions and from discussions with doctors and counsellors in all four districts, we find that assignment of individual cases to specific risk categories is often based on assumptions compounded by misinformation about HIV transmission efficiencies through various routes. Doctors and counsellors usually ask first about sexual exposures, and if there is the slightest chance of exposure through that route, they may not ask about other possible exposures. Many doctors and counsellors ask about blood transfusions, particularly when no sexual risk is reported.

There is a clear bias towards attribution of HIV infections to sexual exposures. Even when reported sexual behaviour provides no chance for sexual exposures to HIV,

counsellors may nevertheless attribute cases to the sexual route on the basis of suspected but unreported sexual behaviours. Counsellors and doctors told us "People may say they do not have sexual risks, but we can make out," and "Men are like that, they go *out* and then come home and infect their wives; how can we believe when they tell us that they have not had sex outside marriage," and "He is a truck driver, what can you expect?" One doctor described to us how he counsels: "I inquire about their sexual exposure. If they don't disclose, then I tell them 'May be it's not your fault, you must have gone out with your friends, must have had drinks and then maybe you went to a sex worker.' I don't need to ask about other routes, because we know how people usually get this disease."

When people try to explain that they suspect their HIV infections came from unsterile medical injections or other blood exposures, counsellors routinely dismiss their explanations, since "people do not want to admit about their sexual practices." As one doctor said "people do say it is this and that but ultimately it is sexually related and nothing else." Even in cases with multiple documented exposures to medical care, doctors were unwilling to accept and report HIV transmission from unsafe health care (other than blood transfusion), as they felt the "risks were negligible."

HIV-positive people admitted in some of the AIDS case reporting hospitals reported that doctors never asked them about risks other than sexual. The most common question is "Bhair gello?" or "Bahar gaya tha kya?" ("Have you gone 'outside'?") Many positive people we talked with were unaware of non-sexual routes of transmission. While some denied sexual risks, many others assumed they must have got it through sex, despite their low risks through that route. In fact, the risk assessment process, with its focus on the sexual route, may be contributing to public ignorance about non-sexual risks.

In all the reports that we were able to access on AIDS cases in the four districts, we found no adult cases attributed to non-sexual exposures, apart from a few that have been placed in the category 'others' (Table 7.2). Data from the VCCTCs show similar results. In one reporting hospital we visited, the VCCTC had no cases in 2003 and 2004 through any other route than sexual and mother-to-child. In another, the VCCTC has reported no non-sexual adult AIDS cases from the start of the VCCTC in 2001.

These reports conflict with informal information we collected during interviews with counsellors and doctors in health facilities. In virtually every hospital we visited, including AIDS case reporting hospitals, doctors and counsellors acknowledged that they had come across cases for which they could not explain the route of transmission, or suspected nosocomial transmission.

Doctors and counsellors did not investigate these cases. During interviews, they explained that investigation was not part of their mandate, and that these cases were exceptions. We found that many health care professionals were opposed to investigating cases, or even educating people to recognize medical procedures as risks for HIV acquisition. The head of one of the hospitals reporting AIDS cases, on condition of anonymity, acknowledged "We sometimes get HIV cases that we cannot explain; they may be through unsafe procedures either in our hospital or elsewhere. To be honest, we do not want to investigate further; because our hospital may be implicated."

**Table 7.2: Adult cases reported through non-sexual routes**

| District | 2002 | 2003 | 2004 |
|---|---|---|---|
| Sangli | Nil * | Nil | Nil |
| Belgaum | NA | NA | Nil † |
| South Goa | Nil | Nil * | Nil |
| Namakkal | NA | Nil | NA |

* In 2002 in Sangli, 14 percent of cases were categorized as 'others'
* In 2003 in Goa, 1 percent of cases were categorized as 'others'
NA : Not available to our team
† In Belgaum, there were 353 cases reported in 2004. None of the 160 cases reported from the Government hospital were through non-sexual routes. The remaining 191 cases from KLES were categorized as 'non-specified'.

**Unreliable information on routes of transmission**

Many experts – even those involved in AIDS case reporting – do not realise the importance of the data on routes of transmission generated through AIDS case reporting. Doctors who spoke to us about non-sexual or unexplained routes of HIV transmission were asked why this did not seem to be reflected in the reports to the States. They did not see any link between the two. One doctor responsible for AIDS case reporting admitted that "those reports are just something that we have to send to the SACS. Of course they are false."

We also observed that when the State level data does not fit the national data in terms of transmission routes, there is an attempt to get this data to 'fit'. For instance, in Goa when the category marked 'other' exceeded 10 percent, officials in SACS took note and asked questions, since the national data shows about 6 percent in this category. Reports of subsequent months show that the data now adequately reflects national statistics!

The near exclusive focusing on the sexual route has become a vicious cycle. In the course of interviews, doctors and counsellors said that the sexual route was already firmly established as being responsible for the spread of HIV in the country. Their information was therefore, in keeping with the state and national data. "Look at the national statistics. Of course, it's all through sex. We don't need to question the clients so much when we already know that they must have got it through sex," or "Why are you wasting your time looking at the exceptions? There are hardly any cases in the country that are through other routes." With the vicious cycle of prior reports leading to suspicion and assumption of sexual acquisition, the numbers attributed to the sexual route keep increasing – from 74 percent in 1999 to 86 percent in 2005.

*Risk assessment at VCCTCs*

When people present to a VCCTC for an HIV test, the counsellor is supposed to conduct pre-test counselling, which includes risk assessment. Because some AIDS case reporting may be done through the VCCTC structure, and because VCCTC data is often used to corroborate conclusions from AIDS case reporting, we also looked at risk assessment during counseling at the VCCTC. Virtually all of the difficulties with risk assessment which we found in AIDS case reporting are present also during pre-test counselling. The VCCTC reporting formats have similar problems as AIDS case

reporting formats. Several VCCTCs use any one of the out-of-date formats that NACO has developed over the years, some have developed their own formats, and NGOs use their own. It is unclear how data is consolidated at district, state, and national levels. Moreover, risk assessment during pre-test counselling is based on a one-off and often time-bound meeting, and is often perfunctory. Hence, risk assessment during pre-test counselling is very likely even less reliable than from AIDS case reporting.

**Numbers and sources of AIDS cases reported**

In the early years of the HIV/AIDS epidemic in India, hospitals reported very few AIDS cases. Through September 1991, only 96 AIDS cases (including 13 foreigners) had been reported.[2] As of January 1999, 13 years after the first case was discovered, only 6,703 AIDS cases had been reported, of which 3/4ths were from Maharashtra and Tamil Nadu.[3] Through end-July 2005, a cumulative total of 111,608 AIDS cases have been reported, which may be very roughly around 20 percent of actual AIDS cases. Seventy percent of these cases are reported from Tamil Nadu, Maharashtra, and Andhra Pradesh.

Under-reporting of AIDS cases is evident. For example, from 1987 through August 2004, Karnataka recorded a cumulative total of 5,803 AIDS cases, which is only 12 percent of the number of people that VCCTCs reported to be HIV-positive. Considering that most people who test HIV-positive are already sick, the ratio of AIDS cases to those testing HIV-positive is surprisingly low.

According to NACO, one of the purposes of AIDS case surveillance has been to assess AIDS incidence, which would require that most AIDS cases be reported.[4] However, AIDS case reporting is voluntary. Only a minority of government hospitals report AIDS cases, and limited efforts have been made to collect information from private hospitals and doctors. For example, no private health facilities in Maharashtra report AIDS cases to the MSACS.

During this research, we interviewed many private doctors who treat AIDS cases. None have been requested to report AIDS cases to SACS. One such doctor in a district town treats an average of 2-3 new AIDS cases per day. Another sees about 60 AIDS patients a month, of which 10-15 are follow-up cases.

Private health facilities that report AIDS cases may not report the routes of transmission. Private doctors and hospitals which cater to relatively privileged people may not be willing to question patients about the routes of HIV transmission. For example, KLES hospital, a large private hospital in Belgaum, sends AIDS case reports to the KSAPS but does not report routes of transmission. Therefore all cases sent by KLES to the KSAPS are categorized as 'not specified' (which could at least partially account for Karnataka's having a relatively high 11 percent of cumulative AIDS cases through end-2004 in the category 'others [not specified]').

[2] World Bank. Project Performance Assessment Report: India: National AIDS Control Project (Credit No. 2350). Report No. 26224. Washington DC: World Bank, 2003. p.2.
[3] Specialist's Training and Reference Module – NACO, Ministry of Health and Family Welfare, not dated
[4] NACO: Programs-National AIDS prevention and Control Policy
http://www.nacoonline.org/prog_policy.htm accessed on 1st August 2004

**Options to improve reliability of risk assessment in AIDS case reporting in India**

*Revised formats and risk exposure categories*

In order to increase reliability of AIDS case reporting we propose an alternate "risk assessment guide" (see Box 3) and format for monthly reporting of "AIDS cases' risk exposure categories" (Table 7.3).

**BOX 3: Proposed guide to discuss exposures to date, and risks to avoid in the future**

**Risk Assessment Guide**

*HIV transmission was rare in India until the mid-1990s. Which of these possible exposures to HIV have you experienced in 1996 or later?*

1. Have you received transfusion of blood or blood products?
2. Have you injected drugs for recreation?
3. Have you received any medical injections or infusions with syringes, needles, or plastic tubes that were not new and opened in front of you?
4. Have you received dental care with instruments that may not have been boiled or sterilized between patients?
5. Have you had any surgery (tubal ligation/vasectomy, cataract, other) where you were unsure of the sterility of the instruments used?
6. Have you had any blood tests (with needles, lancets) or other exposures to blood during medical care where you were unsure of the sterility of the instruments used?
7. Have you received a tattoo where the tattooist did not change the needle and inkpot between customers?
8. Have you had your ear or other part pierced with instruments reused from one person to another without boiling?
9. Have you received a shave in the market with instrument reused from one person to another?
10. Do you share razors or toothbrushes with your husband/wife around the house?
11. Have you had other blood exposures? Specify.
12. Are you married, or have you ever been married?
13. Have you had a heterosexual partner who tested HIV-positive, or who has died of suspected AIDS?
14. Have you ever paid or received money for sex?
15. Have you ever had receptive anal sex?
16. Have you had any other sex partners?
17. Have you had any other suspected exposure that we have not discussed?

*Additional question for women*

18. Have you had a delivery, medical termination of pregnancy or other gynaecological procedure where you were unsure of the sterility of the instruments being used?

*Additional question for health care workers*

19. Have you had any needlestick accidents or other occupational exposure to blood?

*For children*

20. Has the child's mother tested HIV-positive or died of suspected AIDS?
21. If not, has the child been exposed to any of the blood exposures mentioned above? (questions 1, 3-8, 11)

**Table 7.3: Proposed format for monthly AIDS case reporting**

| AIDS cases' risk exposure categories<br><br>Reporting institution:<br>Reporting officer:<br>Month/year: | | | | | |
|---|---|---|---|---|---|
| Risk category | Questions to determine who goes in this category | Number of cases | | % of cases | |
| | | M | F | M | F |
| 1. Illegal injection drug use | Yes to qn. 2 (irrespective of answers to other qns.) | | | | |
| 2. Receptive anal sex | Yes to qn. 15, no to qn. 2 (irrespective of answers to other qns.) | | | | |
| 3a. Heterosexual sex: sex with known HIV positive person | Yes to qn. 13 only (no to qns. 2, 14 and 15, irrespective of answers to other qns.) | | | | |
| 3b. Heterosexual sex: commercial sex | Yes to qn. 14 (no to qns. 2 and 15, irrespective of answers to other qns.) | | | | |
| 4. Receipt of blood or blood products | Yes to qn. 1; no to qns 2, 13, 14, 15 (irrespective of answers to other qns.) | | | | |
| 5. Occupational exposure to blood | Yes to qn. 19; no to qns. 2, 15, 13, 14, 1 (irrespective of answers to other qns.) | | | | |
| 6. Blood and sexual exposures (multiple low risk exposures) | Yes to any one or more of qns. 3-11 or 18 + Yes to 12 and/or 16 ((No to all other qns.) | | | | |
| 7. Blood exposures only (low risk exposures) | Yes to any one or more of qns. 3-11 or 18 (No to all other qns.) | | | | |
| 8. Sexual exposures (low risk exposures) | Yes to 12 and/or 16 ((No to all other qns.) | | | | |
| 9. Children whose mothers are HIV+ or have died of suspected AIDS | Yes to qn. 20 (irrespective of answers to other qns.) | | | | |
| 10. Children without vertical acquisition of HIV | Yes to qn. 21 | | | | |
| 11. Persons with other or no reported risk (explain each case in a note) | Yes to qn. 17 only, or no to all qns. | | | | |

The guide and format are designed to guide counsellors to assign AIDS cases into a hierarchical system of "risk exposures categories." The proposed hierarchy of "risk exposure categories" is based on transmission efficiencies and probabilities of becoming infected through each exposure in India.

Notably, counsellors can collect and NACO can report objective information about risk exposures; this does not involve interpreting or guessing what might be the

actual route of HIV acquisition. Hence, the proposed format reports "exposures" rather than routes of transmission. These proposals are designed not only to make the information in AIDS case reporting more objective, but also to provide some additional useful information which could be helpful in planning intervention programmes. For example, the heterosexual risk category includes two specific high risk behaviours, viz. sex with a known HIV-positive partner, and commercial or paid sex. Cases reporting other heterosexual partners are considered to have low risk sexual exposures. Similarly, the format recognizes receptive anal sex, a high-risk behaviour among MSMs, as a separate "risk exposure category."

The format also asks for counsellors to recognize and report multiple low risk blood and/or sexual exposures as separate "risk exposure categories." Reporting cases in these categories admits, on the one hand, that one cannot with any confidence point to the exposure through which the person acquired his or her HIV infection, but at the same time, these reports acknowledge invasive health and cosmetic services as well as low risk sexual exposures as risks.

Further, based on information from the 80 interviews that we conducted with HIV-positive people using our modified questionnaire (see Chapters 2 and 3, and Appendix C), Table 7.4 assigns these 80 cases to "risk exposure categories." Because our respondents were not a random sample of HIV-positive people in the general population, the data here cannot be generalized. Moreover, as the questionnaire was developed much before the format, the questions do not exactly coincide with those in the "risk exposure categories". The purpose of the table is to give an indication of the value of the information that can be presented in the format.

**Table 7.4: Risk exposure categories for 80 respondents**

| Risk exposures | Number of cases | | % of cases | | |
|---|---|---|---|---|---|
| | men | women | men | women | Total |
| 1. Illegal injection drug use | 2 | 0 | 4.44 | - | 2.5 |
| 2. Receptive anal sex | 1 | 0 | 2.22 | - | 1.25 |
| 3. Heterosexual sex<br>a) with known HIV-positive person<br>b) commercial sex | <br>9<br>20 | <br>21<br>7 | <br>20<br>44.4 | <br>60<br>20 | <br>37.5<br>33.75 |
| 4. Receipt of blood or blood products | Nil | Nil | - | - | - |
| 5. Occupational exposure to blood | Nil | Nil | - | - | - |
| 6. Blood and sexual exposures (multiple low risk exposures) | 12 | 7 | 26.6 | 20 | 23.75 |
| 7. Blood exposures only (low risk exposures) | 1 | Nil | 2.22 | - | 1.25 |
| 8. Sexual exposures (low risk exposures) | Nil | Nil | - | - | - |
| 9. Persons with other or no reported risk (explain each case in a note) | Nil | Nil | - | - | - |
| TOTAL | 45 | 35 | 100 | 100 | 100 |

*From whom to collect information?*

Under-reporting of AIDS cases is a problem if one wants to use AIDS case reporting to assess the trajectory of the epidemic. On the other hand, the numbers of AIDS cases reported is sufficient to estimate the proportions of cases associated with specific risks. The problem is with the quality and accuracy of the reported information, not with the volume. If reporting is more complete from government hospitals catering to poor people than from private hospitals catering to the wealthy, and if risks for HIV acquisition vary across classes, under-reporting may bias information about routes of transmission. Also, if there is only one AIDS case reporting hospital in a district which has certain biases in its reporting system, this data becomes reflective of the entire district. However, these are minor problems relative to current concerns with the reliability of what is reported. Without addressing the biases in the reporting systems, additional numbers will not improve the reliability of the data.

Risk assessment for AIDS case reporting currently relies on information from inpatients. Communication with inpatients is limited by their physical condition, the time that they stay in the hospital, and lack of privacy in the wards. The new government programme to provide free antiretroviral treatment (ART) may provide an opportunity to improve risk assessment in AIDS case reporting by collecting information on risk exposures from people on ART. Because patients on ART return repeatedly for medications, there is an opportunity for counsellors and doctors to build rapport with patients before asking them about risk exposures; for example, a session to discuss risk exposures could be routinely scheduled at some time from 6-12 months after they begin treatment.

# Chapter 8
# Conclusions and Recommendations

We conducted an exploratory study in four southern districts with high HIV prevalence (a) to characterize blood exposures in health and cosmetic practices that could be a risk for acquiring and transmitting HIV; and (b) to assess the reliability of surveillance systems to capture information on risks for HIV transmission. Findings from this study show that people may be exposed to HIV-contaminated blood through a wide range of common invasive procedures, and that this may be contributing much more to India's HIV epidemic than most people realize. The study also shows that NACO's widely-used estimates of the proportion of HIV infections in India from sexual contact – which are derived from AIDS case surveillance – are unreliable due to short-comings in the way the surveillance system collects and reports information on routes of transmission.

This chapter summarizes conclusions and presents recommendations.

## Conclusions

*Literature review of evidence and surveillance on routes of HIV transmission*

Common views about what is driving India's HIV epidemic have been based on insufficient evidence and assumed parallels with other countries. Virtually all of the available – if limited – evidence from India points to an important contribution from unsterile invasive health care and cosmetic procedures. In short, available evidence shows that HIV risk is a two-way street, with a substantial but unknown proportion of infections coming from blood exposures. Unfortunately, assumptions about the overwhelming importance of sexual transmission have discouraged attention to blood exposures, not only in prevention but also research.

Governments of many countries collect information from people living with AIDS on their risks to contract HIV infection, and use this information to estimate the contribution of various routes of infection to HIV epidemics. In the US, which has a Pattern 1 HIV epidemic, AIDS case surveillance attributes HIV infections to categories based on reported behaviours. These categories are listed in a hierarchy from high risk (e.g., MSM and IDU) to low risk behaviours and the rules for reporting leave very little room for subjectivity. AIDS case surveillance in the US does not attribute HIV infection to heterosexual risk without specific information about high risk sexual behaviour. In contrast, AIDS case surveillance in India assigns almost all HIV infections in adults to heterosexual risks on the basis of much less exact and persuasive evidence of sexual exposure to HIV.

*Documenting blood exposures as risks for HIV transmission*

We interviewed 280 PLWHAs – 70 in each of four districts – to document their possible exposures to HIV and to find out what counsellors asked them about routes of transmission. PLWHAs reported multiple possible exposures to HIV through sex and blood, so that it is difficult to attribute their infections to any specific exposure. Their counsellors or doctors asked mostly about sexual exposures. Although a majority of the PLWHAs we interviewed believed that they had acquired the virus through sex, substantial minorities had no idea how they were infected, or believed they had been

infected through a non-sexual route. Many PLWHAs were not aware of non-sexual risks for HIV acquisition.

We found many unexplained and suspected nosocomial HIV infections which have neither been recorded nor investigated. Lack of attention and interest in these cases on the part of the medical community not only denies care and compensation to those who are infected, but also means that nothing is learned from these cases about the infection control lapses that may have been responsible – and that may well continue to infect others with HIV and other bloodborne pathogens.

We found that health care providers and managers and the general public have been misinformed – and dangerously underestimate – HIV's survival outside the human body in dry and wet conditions as well as its transmission efficiency through blood exposures. Even so, there has been a substantial change over the last 5 to 10 years towards safer practices in some health care procedures (notably blood transfusions and injections) and in cosmetic services (notably shaving by barbers). These changes have occurred through a combination of government, private, and NGO initiatives. The potential contribution of these changes to the reported slowing of HIV epidemic growth in India over the last 5 years has been ignored.

However, problems remain. Reuse of unsterile and unreliably sterile syringes and/or needles continues on a massive scale; major and urgent initiatives are required to address this well-known but continuing risk. Despite substantial improvements in testing of transfused blood, continuing reports of people infected through transfusions suggest lapses in testing or record-keeping; and professional blood donors continue to operate. Furthermore, changes to date have focused on a limited range of procedures, largely ignoring other common invasive procedures.

We found that government health officials were aware of common infection control lapses in public and private settings. At the same time, they explained that they had no power to take action against private health care or cosmetic providers whose practices were unsafe. Although NACO has a broad mandate to address risks for HIV, including nosocomial risks, NACO's attention to infection control in hospital settings (as reflected in NACO documents) has focused on safety of health care providers; NACO and health facilities have given less attention to reducing patient-to-patient transmission risks. Unsafe disposal of medical waste continues to be common, despite increasing attention to the problem and partial solutions in recent years.

People who are considered vulnerable to HIV infection due to sexual or drug injecting behaviours, viz. FSWs, MSMs, truckers, migrant labourers, and IDU, are marginalized and stigmatized, and are therefore at greater risk to experience unsterile health care than are people in mainstream society. People with unsafe sexual behaviours seek more (unsafe) health care. Furthermore, because members of vulnerable groups often frequent the same health care and cosmetic facilities, high HIV prevalence among patients at those facilities enhances risk to contract HIV from unsterile care. Due to the lack of research into unsafe health care and cosmetic practices as risks for HIV transmission, we do not yet have a clear idea about the relative contribution of blood and sexual exposures to HIV spread among vulnerable groups.

*Assessing routes of HIV transmission from AIDS case surveillance*

We examined AIDS case reporting systems, with particular attention to reliability in assessing and reporting routes of HIV transmission. We found that NACO's formats for hospitals' monthly AIDS case reports do not facilitate accurate or objective reporting of what can be learned from inpatients with AIDS about how they acquired HIV infection. Only a few risk categories – mother to child and blood transfusion on all forms, and homosexual and IDU on some forms – record exposures that reliably point to high-risk exposures. Formats make no distinction between low and high-risk sexual exposures, or between IDU and medical injections. Because current formats have no category for blood exposures other than blood transfusions and injections (which is ambiguous), they not only do not encourage doctors and counsellors to ask about other blood exposures, but actually block reporting of such exposures. Consequently, NACO's data on routes of transmission – derived from AIDS case reporting – reflect assumptions and subjective assessments and are incomplete and unreliable.

Within hospitals, we found no standardized formats to collect information from AIDS patients on sources of infection, and no standardised systems for reporting that information. Doctors and counsellors who are responsible to assess and report routes of infection have not been trained to do so. Moreover, we found widespread misinformation about the relative risk for HIV transmission through blood and sexual exposures.

During meetings with AIDS cases, doctors and counsellors often ask about blood transfusion and IDU as risks, but pay little attention to medical injections or other blood exposures. There is a clear bias towards attribution of HIV infection to the sexual route based on assumptions about sexual behaviours, moral judgments, and a belief that sex is almost solely responsible for India's epidemic. Virtually all non-marital behaviour is considered sufficiently high-risk to warrant assigning a case to sexual risk. We found that counsellors were not ready to recognize and report that many AIDS cases had an unknown route of HIV acquisition based on available evidence.

As of July 2005, NACO's AIDS case surveillance data attributes 86 percent of HIV infections among cases to sexual exposures, 2.4 percent to IDU, 2.0 percent to transfusion of contaminated blood and blood products, 3.6 percent to mother-to-child transmission, and 6.0 percent to others, not specified. Over the last several years, reports from the four districts in this study, attribute no adult AIDS case to any specific non-sexual route, although every health facility reported such cases to the research team. Unexplained infections were neither reported nor investigated for different reasons, viz. they were viewed as exceptions, investigations were not part of the mandate of the reporting hospitals, and they could implicate the health facility.

**Implications**

NACO's estimates of the proportions of HIV infections from various routes of transmission – which are based on AIDS case surveillance with all its shortcomings – have over the years contributed to a belief that is widespread among both the public and AIDS policy makers that heterosexual transmission is responsible for almost all HIV infections in Indian adults. The repetition of unreliable data has influenced international, regional, national and local agencies to focus almost exclusively on sexual risks. More reliable information about the relative contributions of sex and blood exposures to India's HIV epidemic could provide a better basis for prevention efforts.

Public education about dangers from unsterile health care, and about how to ensure safe care, could allow people to protect themselves. Giving people accurate information about lapses in infection control may well lead to some temporary discomfort among public health professionals. However facing these problems directly will in the long run increase faith in the health care system – a faith that will be well-placed, rather than misplaced, once safe care becomes the norm.

The near exclusive focus on the sexual route may have inadvertently intensified the stigma experienced by PLWHAs. Addressing all the routes of transmission may reduce this stigma, as family, neighbors, and others understand that infection with HIV may have nothing to do with sexual behaviour, but may rather point to unsafe dental or medical care, etc.

**Recommendations**

Based on study findings, we recommend research to determine how much blood exposures – including medical injections, dental care, tattooing, and others – contribute to India's HIV epidemic. However, even without additional research, the available evidence is sufficient to ask for a wide range of changes in public health and HIV prevention programmes to alert people to risks in blood exposures and to improve infection control in health care and cosmetic services. We also suggest some specific changes in AIDS case reporting to improve the reliability and usefulness of information on risks and on routes of HIV transmission.

*Research*

- Additional research is required to characterize the variety and frequency of unsterile blood exposures in health care (e.g., STD treatment, dental care, health camps, blood tests) and cosmetic procedures (e.g., tattoos, piercing, manicures).
- Additional research is required to assess the contribution of unsterile blood exposures to India's HIV epidemic. This research could include:
  - Re-analysing available data from completed studies.
  - Revising ongoing or planned studies of risks for HIV incidence or prevalence to include questions about blood exposures.
  - New studies specifically designed to gather information on blood exposures as risks for HIV infection. New studies could include:
    - Research into risks for HIV incidence among women in the general population in conjunction with PPTCT programmes. Research could use BED[1] or other technology to identify incident infections together with questionnaires to collect information on sexual and blood exposures.
    - Research into risks for HIV incidence among FSWs – especially new and/or brothel-based FSWs – with attention to blood exposures in health care and cosmetic services.
    - Research at selected hospitals in high-prevalence districts to test (with informed consent) all children aged 2 to 15 years who register as in-patients, and to test also mothers of children found to

[1] Association of Public Health Laboratories. CDC HIV incidence surveillance protocols, March 30 2005. Available at: http://www.aphl.org/programs/infectious_diseases/hiv.cfm. Accessed 13 November 2005

be HIV-positive. This study could provide an insight into the extent, if any, of nosocomial HIV transmission in the community.

- Action research in southern and northeastern districts with high HIV prevalence could help to develop and test policies and procedures to promote and enforce infection control in public and private health care and cosmetic services (see also recommendations for health care professionals, below).
- Research activities proposed above could be implemented through a range of public and private organizations, including research institutes, universities, and NGOs.
- NACO, NGOs, and other organizations should make public available data that is relevant to understand India's HIV epidemic, including:
  - Findings from NACO's 2002-03 national sample survey of HIV and STD prevalence, with information on HIV prevalence in 162 clusters and more than 15,000 individuals.
  - Raw data from surveys conducted by ICHAP among the general population in Bagalkot District, Karnataka
  - Raw data from surveys supported by APAC among the general population, truckers, and female sex workers in Tamil Nadu.
- The Government should ensure that questionnaires and data from epidemiological and medical studies in India be placed in the public domain (without disclosing information about identifiable research subjects) within two years after a study has been completed.
- Protocols for future studies on risks for HIV infection in the general population and targeted groups should be designed to ensure that samples are not biased and to improve the value of information collected. Specifically,
  - Surveys among the general population should arrange to test and interview people at their homes rather than at health camps. Testing people at health camps introduces bias because health camps may be a risk, and because people who attend health camps may be from low socioeconomic groups.
  - HIV serosurveys among the general population should consider extending testing to children aged 2-15 years and to adults of all ages, i.e., to include age groups not considered to be at risk for HIV through sexual activities.
  - Studies among high-risk groups should be designed to avoid bias by contacting people on the street or at their place of work rather than in STD clinics.
  - Testing blood samples for hepatitis C as well as HIV could provide additional information about lapses in infection control.

*Prevention through public education*

- Evidence of associations between blood exposures and HIV infections, and of confirmed and suspected nosocomial infections should be widely disseminated through public media.
- Messages that blood exposures are a risk for HIV infection should be disseminated to the general public through all channels, e.g., NGOs, educational institutions, local elected bodies, consumer forums, transport vehicles, festivals and fairs. These messages should include:

- information on survival of HIV in various conditions and on transmission efficiency through blood exposures;
- warnings about risks for HIV acquisition in common health care procedures, including reuse of syringes and/or needles for medical injections, reuse of instruments without sterilization in dental care, etc;
- warnings about specific risks for HIV acquisition in common cosmetic procedures, such as tattooing; and
- advice about how to ensure sterile health care and cosmetic procedures.

- Messages for targeted high-risk groups should be developed and disseminated through NGOs and public health services, to educate them about their specific risks to acquire HIV through blood exposures (e.g., STD treatment and tattooing).
- People should be encouraged to ask questions, to insist on safe practices, and to complain both to the provider and to district health offices when they observe unsafe practices in any setting.

*Prevention through government initiatives for infection control*

- A dialogue among public officials, public interest organizations, and individuals may be required to develop a workable consensus about the responsibilities of the Government to encourage and/or to enforce infection control in public and private settings and/or to educate the public about risks in blood exposures, and how best to do so.
- The Ministry of Health and Family Welfare and state Departments of Health should establish divisions responsible to monitor and promote infection control in health care and cosmetic settings.
- At state and district levels, mechanisms are required to ensure that public and private health and cosmetic facilities follow standard precautions. These mechanisms may include:
  - Accreditation, licensing and regulation of public and private health and cosmetic facilities.
  - Offices and systems to receive and respond to complaints about unsafe practices.
  - Offices to inspect health and cosmetic facilities to ensure that they implement standard precautions.
- To develop district level mechanisms to promote infection control in health care and cosmetic services, action research could be implemented in selected southern and northeastern districts with high HIV prevalence. For this, we propose a team of three to five persons supervised by a senior infection control specialist living and working in a district for a year. Activities should include hospital and clinic interventions, in-service professional training, new responsibilities for district health officers, public education, and others.

*Prevention through interventions with health care professionals and providers of cosmetic services*

- Hospital infection control committees and systems should be strengthened and extended to include all categories of workers who must cooperate to protect patients and/or who are at risk through their handling of contaminated materials.

- Pre-service training for allopathic and ISM practitioners should be reviewed and revised to ensure:
    - Accurate information about HIV survival and transmission efficiency through blood exposures.
    - Knowledge of standard precautions to protect patients and health care providers.
- Arrangements and materials are required to strengthen in-service training on infection control. This training should be extended to:
    - All public and private allopathic and ISM health care professionals.
    - RMPs and unregistered health care professionals.
    - Cosmetic service providers.
- Attention currently focused on infection control during blood transfusion and medical injections (especially vaccinations) should be extended to all invasive health care and cosmetic procedures.
- All programmes working with targeted groups should be re-examined and revised to promote and to ensure effective infection control during invasive procedures such as STD treatment to which the groups are vulnerable.
- Despite recent gains, new policies and programmes are needed to ensure safe disposal of medical waste, particularly from private clinics.

*Response to unexplained cases of HIV*

- Suspected nosocomial and other unexplained HIV infections should be recognized and recorded. Each SACS could name and fund an institution to maintain a registry of cases. Each case reported to the registry should be reviewed to consider possible routes of transmission.
- To demonstrate zero tolerance for nosocomial HIV, the principle should be established that the government should investigate suspected nosocomial infections. Depending on resources available:
    - All cases (in the registries mentioned above) that can be traced to specific health care institutions should be investigated by testing 25-50 others who visited the same institution on or around the date of the suspected nosocomial HIV transmission.
    - When multiple nosocomial infections are documented or suspected from a specific institution, investigations should be expanded to investigate other possible infections from that institution over an extended period, and to identify the specific wards and procedures responsible.
- Testing for HCV infections should be extended to identify infection control lapses in health care and cosmetic services.
- In cases where blood transfusion is a possible cause of HIV infection, the person who donated the blood should be traced and retested. This is feasible with current blood donation policies, which allow donors to request information on their HIV status.
- The Government should extend care and compensation to people with HIV infections acquired from unsterile public or private health care.

*Improving information on routes of transmission from AIDS case surveillance*

- AIDS case reporting formats should be designed to collect objective information on risk exposures. Formats that record and report risk exposures rather than routes of transmission will allow doctors or counsellors to report exactly what the AIDS cases tell them about their past behaviours and risk exposures, rather than to speculate about what might have been their route of HIV acquisition.
- Questionnaires or guidelines for counsellors to ask about risk exposures should direct counsellors to
    - Ask about a wide range of parenteral exposures, including dental care, tattoos, whether or not syringes were taken from sealed packages in front of the patient, etc.
    - Collect sufficient information about sexual exposures to identify specific high risk exposures, if any (e.g., MSM, paid sex, sex with someone who has tested HIV-positive).
- AIDS case reporting formats and procedures should establish a hierarchy of risk exposure categories (from most risky, to less risky), along with clear rules about the evidence required to classify a case in one or another category.
- Cases with heterosexual exposures should be reported according to two specific risk exposure categories, i.e., unprotected sex with FSWs, and having a spouse or other sexual partner who tests HIV-positive, or who has died of a suspected AIDS related illness. Cases with only lower risk heterosexual exposures, (e.g., one or more non-spouse partners) and with low risk blood exposures should be reported as having "low risk blood and/or sexual exposures."
- A case control study could be conducted in two to five health facilities to compare alternate risk assessment guidelines and risk reporting formats, including what is in current use by the facility, and what is proposed in Chapter 7. From this experience, revised guidelines and formats could be recommended for wider adoption.
- Training should be provided to doctors and counsellors on risk assessment during AIDS case reporting.
- To improve the reliability of risk assessment in AIDS case reporting, risk assessment may be extended to persons accessing ART through government programmes. If this is done, discussions with ART recipients about their risk behaviours – to assign them to one or another risk exposure category – could be scheduled at least 6 months after people start on ART in order to allow counsellors and patients to establish mutual trust.
- Efforts should be made to increase AIDS case reporting by the private sector.
- NACO and others who are responsible for information about routes of transmission from AIDS case reporting should evaluate the reliability and accuracy of the data they report, and should report the data with appropriate caveats and warnings about possible biases and errors.

# Appendix A
# District profiles

**Sangli District, Maharashtra**

Sangli District is situated in the southern region of the state and consists of nine blocks (talukas). The area of the district is 8,602 sq. kms. The two main urban centres, Sangli and Miraj have well established educational institutions in all fields. There are excellent communication facilities all over the district. According to the 2001 census the total population of the district is 25.83 lakhs with an urban population of 6.33 lakhs and rural of 19.5 lakhs. The male-to-female ratio is 1000:957 and the literacy rate is 77 percent.

The district has 59 primary health centres and 270 sub-centres along with 10 rural hospitals, 51 allopathic dispensaries, two ayurvedic dispensaries, and two general hospitals. There are 11 additional new primary health centres in the pipeline. Working in the private sector in Sangli are two NGO hospitals, 919 private hospitals, 1,094 private clinics and two hospitals run by charitable institutions.

**Belgaum District, Karnataka**

Belgaum is situated in northwest of Karnataka and shares borders with Maharashtra and Goa. The district comprises 1,278 villages with an area of 13,415 sq. kms. and a population of around 5 lakhs. The male to female ratio is 1000:965 and the literacy rate is 65 percent.

Belgaum has 122 primary health centres, 616 sub centres, and 5 Urban Family Welfare Centres and 13 general hospitals.

**South Goa District, Goa**

The district of South Goa is divided into 5 talukas: Sanguem, Canacona, Quepem, Salcete and Mormugao. The district is spread over 1,968 sq. kms. having plains, hills, mountains and rivers besides a vast coastal area. According to the 2001 census the total population of the district is 6.51 lakhs. The male to female ratio is 1,000:968 and the literacy rate is 79 percent.

The district has 68 hospitals; 10 are under the Directorate of Health Services (DHS), of which six are attached to primary health centres or community health centres; five central government hospitals are for specific populations (e.g., members of the navy); and there are 53 private hospitals. In addition the district has 69 health sub-centres, 110 allopaths with the DHS, 595 with private medical clinics and over 210 dentists.

**Namakkal District, Tamil Nadu**

Namakkal District, with Namakkal as its headquarters, was bifurcated from Salem District from 1st January 1997. The district has four talukas viz., Namakkal, Rasipuram, Tiruchengode and Paramathi-Velur, and covers an area of 3,363 sq. kms. The economy of the district is primarily agricultural.

The total population is 14.96 lakhs, with a male-to-female ratio of 1,000:929 and a literacy rate of 68 percent. The district has 62 primary health care centres, 248 public health care centres and 15 government hospitals.

## Appendix B
## Contacts for PLWHA interviews

| District | | Organization and address | Telephone |
|---|---|---|---|
| **Sangli** | 1) | Amhich Amche<br>Old Kondwada, Near Aamrai, Sangli | 91-233-2621746 |
| | 2) | Aastha Drop-in Centre<br>Rajaram Bapu Pratisthan<br>Near Aadarsh Balak Mandir<br>Islampur, Sangli. | |
| | | | |
| **Belgaum** | 3) | Spandana Network of Positive People<br>1506 Sector No.8<br>1st Floor Anjanaya Nagar,<br>Belgaum 16. | 91-831-5532045 |
| | 4) | AIDS Counseling & Treatment Centre<br>City Plaza, Opp. Pai Hotel<br>Samadevi Galli, Belgaum<br>e-mail: drpsivarama@hotmail.com | 91-831-2465680 |
| | | | |
| ***South Goa*** | 5) | Asro Community Care & Support Center<br>Near Holy Cross Church,<br>Cavelossim, Salcete, Goa | |
| | 6) | Zindagi<br>Flat No. C3, Pengwin Appts.,<br>Near main fish market, Pixem Dongri,<br>Vasco da Gama, Goa 403 802.<br>e-mail: govekar2004@yahoo.co.in | 91-832-2512938 |
| | 7) | Arz<br>MHN27/1, Baina Beach, Baina,<br>Vasco da Gama, Goa 403 802.<br>e-mail: arz@sancharnet.in | 91-832-2519951 |
| | 8) | Freedom Foundation Community Care Centre<br>Opp. Hotel Green Park<br>105/A2 Sorvem, Guirim,<br>Bardez, Goa | 91 832 2264262 |
| | 9) | CARE<br>Nitya Seva Niketan,<br>Rivona, Sanguem, Goa. | |
| | | | |
| *Namakkal* | 10) | Women's Organisation in Rural Development<br>186/1, Kavin Harsha Complex<br>Nethaji Nagar, 11th Street<br>Trichy Road, Namakkal 637 001<br>e-mail: wordnkl@ngos.cc | 91-4286-220280 |

# Appendix C
# Questionnaires for PLWHA interviews

## DRAFT QUESTIONNAIRE
## FOR PERSONS LIVING WITH HIV/AIDS (FOR 50 RESPONDENTS)

### SUGGESTED WORD OF INTRODUCTION

*[Greetings] My name is _____, and I am conducting a study supported by an organisation called Norwegian Church Aid. This study is to understand the different ways in which HIV can be transmitted. To do this study, we are asking a series of questions about possible risks that you may have been exposed to that could have caused your HIV infection.*

*This study is being done in 4 States of the country and in each state only one high prevalence district has been selected. In ___ (name of State), _____ (name of district) has been selected. We are trying to meet and interview as many people living with HIV/AIDS as possible in this district. Your cooperation will go a long way in helping us to better understand the nature of this epidemic.*

*The questions will take about 30 minutes to complete. I am aware that the questions are very personal and may also bring back unpleasant memories. You might feel you do not want to answer some of the questions. Taking part is your choice; you can choose not to answer any of the questions or tell me to stop at any time. When we write the results of this study in a report, you will not be identified in the report. Any information divulged by you will be kept strictly confidential. If you have any questions, please feel comfortable to ask them now. If you want to know anything more about the study even at a later stage, you can contact me at ____ (give contact details – your number and Mariette's number)*

To be filled by interviewer <u>at completion of interview</u>

| a) Name of district* ____ | b) Date of interview _____ | c) Site of interview (e.g. VCTC, PWA network, DIC, orphanage) _____ | d) Code number (respondent interviewed in this category) _____ | e) Sex of respondent _____ |
|---|---|---|---|---|

1. Date of birth (or age):
2. Place of residence: Urban/rural (get locality if possible)
3. Occupation
4. What is the average monthly income of your household?
5. Since when have you known that you were HIV positive? Year (get month if possible)

6. Where did you get your HIV test done? (specify the place, if private lab. get name of lab.)

7. Why did you get the HIV test done? a) referred by doctor because you were sick b) necessary for a job c) for visa purposes d) due to awareness of risk behaviour e) any other

*RELATED TO COUNSELLING*

8. Did you receive counselling before you went for the test? Yes/ No

9. If yes, by whom? a) counsellor b) doctor c) nurse d) any other

10. Did you receive counselling when your test results were given to you? Yes/ No

11. If yes, by whom? a) counsellor b) doctor c) nurse d) any other? Yes/ No

12. During these sessions, were you asked about your sexual history? Yes/ No

13. Were you asked whether you had received a blood transfusion? Yes/ No

14. Were you asked whether you had any major or minor surgery? Yes/ No

15. Were you asked about your past illnesses? Yes/ No

16. If yes, were you asked about the medical care you had received? Yes/No

17. Were you asked whether you had been tattooed? Yes/ No

*RELATED TO POSSIBLE RISKS OF GETTING HIV*

18. Do you have any views about when you might have got the HIV infection? (as against the actual test results) If yes, approx. year or time range.

19. Have you ever injected IV drugs? Yes/No

20. If yes, details if any – time period.

21. Do you have any views about how you might have got the HIV infection?

    Yes / No

22. If yes, do you feel you could share this with me? (details as possible)

23. Are you aware that there are other ways that you could have got the infection? Yes / No

24. Has your partner / husband / wife been tested for HIV?

25. Is she/he HIV positive? Yes / No

*I will need you to think back to the period upto 5 years before your HIV test was done and answer the following:*

26. Have you received vaccinations? What type? (TT, Typhoid, Cholera, etc.).

27. When? (As close to actual year as possible, maybe given in relation to respondent's age) Yes / No

28. If yes, how many injections have you received for vaccinations?

29. Were you ill at any stage during that period? Yes / No

30. If yes, can you share the details?

31. Were you treated by any doctor (or any healer)? Yes / No

32. If yes, what type of treatment did you receive?

33. Did you receive any injections? Yes / No

34. If yes, how many?

35. How many other injections have you received and from whom? (elaborate based on local practices).

*IN YOUR WHOLE LIFE*

36. How many times have you been in the hospital? {details (excluding child birth) – which year, period of stay, for what illness}

37. Have you ever been admitted in xyz hospital? (where AIDS case reporting is done)

38. How many times have you received a blood transfusion?

39. How many times have you had surgery (with anaesthesia/ without anaesthesia)?

40. How many times have you been to the dentist? (details – which year, period of stay, for what illness)

41. Have you ever had acupuncture? Yes / No

42. If yes, how many times?

43. How many times have you had tuberculosis skin tests?

44. How many times have you had ear or nose piercing?

45. How many times have you had tattoos with needles?

46. What sort of treatment do you prefer? injections / tablets

47. How many times have you had a blood test?

48. Do you receive regular treatment at any health facility for any chronic disease? Yes / No

49. If so, give details

50. Did you ever come in contact with syringes and needles in your workplace or anyplace else?

*ADDITIONAL QUESTIONS FOR WOMEN*

51. Do you have any children? Yes / No
52. If yes, how old are they?
53. Where did you have your deliveries (specify name of hosp., clinic, etc)
54. Did you take any injections during your pregnancy or delivery? Yes / No
55. If yes, how many?
56. Have you taken any injectible contraceptives? Yes / No
57. If yes, how many (use local names/terms for these).
58. Have you terminated any pregnancies (MTP)? Yes / No
59. If yes, details - (specify name of hosp., clinic, time etc)
60. Have any gynaecological problems that you have had been treated in any way? (specify name of hosp., clinic, time etc)

## INSTRUCTIONS FOR FILLING THE QUESTIONNAIRES

1) Do not prompt any answer.
2) Record the responses by ticking (√ )
3) Where possible, write the responses actually given by the respondents verbatim in the local language (this could be done in the course of the interview only if the respondent is relaxed and comfortable with this; if not, make notes after the interview is complete) Add a separate sheet if necessary (ensure the code number is on attached sheets).
4) Treat all reported information as confidential
5) Give adequate time for respondent to think of replies

CODES:

a) Name of District : Sangli – S ; Belgaum – B ; Namakkal – N ; South Goa - G
b) Date of interview : Write as e.g. 14.3.05
c) Site of interview (eg. VCCTC, PWA network, DIC, orphanage)
d) Code number (respondent interviewed in this category): Each interview is to be numbered as PS1, PS2, PS3 or PN1, PN2 and so on … where P stands for person living with HIV/AIDS, S stands for the district and 1 or 2 for the first and second person interviewed respectively.
e) Sex of respondent: Male – M; Female – F; Eunuch - E

**MODIFIED Questionnaire for 20 respondents**

1. Date of birth (or age):
2. Place of residence: Urban/rural (get locality if possible)
3. Occupation:
4. What is the average monthly income of your household?
5. Marital status: (married / divorced / separated / widowed / single)
6. Since when have you known that you were HIV positive? Year (get month if possible)
7. Where did you get your HIV test done? (specify the place, if private lab. get name of lab.)
8. Why did you get the HIV test done? a) referred by doctor because you were sick b) necessary for a job c) for visa purposes d) due to awareness of risk behaviour e) any other
9. Have you ever been admitted in xyz hospital? (where AIDS case reporting is done)
10. If yes, did you speak with your attending physician about your HIV infection?

    *At (a) xyz hospital (b) VCTC (c) other testing centre*

    *(ask about only one site – a,b,c in order of priority)*
11. Were you asked about your sexual history? Yes/ No
12. Were you asked whether you had received a blood transfusion? Yes/ No
13. Were you asked whether you had any major or minor surgery? Yes/ No
14. Were you asked about your past illnesses? Yes/ No
15. If yes, were you asked about the medical care you had received? Yes/No
16. Were you asked whether you had been tattooed? Yes/ No

*RELATED TO POSSIBLE RISKS OF GETTING HIV*

17. Do you have any views about when you might have got the HIV infection? (as against the actual test results) If yes, approx. year or time range
18. Have you ever injected IV drugs? Yes/No
19. If yes, details if any – time period.
20. Before you knew about your HIV infection did you have sexual intercourse with anyone? Male / Female / Nil?
21. If yes, have you ever had

    (a) sex with a person with known or suspected HIV infection (if yes, nature of relationship with that person, and how do you know the status of the person)

(b) sex with a person for exchange of money (either paid or received)

(c) sex with other casual short-term partners

(d) receptive anal sex

22. Has your partner / husband / wife been tested for HIV?

23. Is she/he HIV positive? Yes / No

*I will need you to think back to the period upto 5 years before your HIV test was done and answer the following:*

24. Were you ill at any stage during that period? Yes / No

25 If yes, can you share the details?

26 Were you treated by any doctor (or any healer)? Yes / No

27 If yes, what type of treatment you received?

28 Did you receive any injections? Yes / No

29 If yes, how many?

30 Did you receive any other injections or infusions for

| | Y/N | When | How many | Who / Where (Details) |
|---|---|---|---|---|
| (a) vaccination | | | | |
| (b) fever / malaria | | | | |
| (c) genital ulcer / any other STD | | | | |
| (d) pain / weakness | | | | |
| (e) other reasons | | | | |

*IN YOUR WHOLE LIFE*

31. How many times have you been in the hospital? {details (excluding child birth) – which year, period of stay, for what illness}

32. How many times have you received a blood transfusion?

33. How many times have you had surgery (with anaesthesia /without anaesthesia)?

34. How many times have you been to the dentist? (details – which year, period of stay, for what illness)

35. How many times have you had tuberculosis skin tests?

36. How many times have you had ear or nose piercing?

37. How many times have you had tattoos with needles?

38. What sort of treatment do you prefer? injections / tablets

39. How many times have you had a blood test?

40. Do you receive regular treatment at any health facility for any chronic disease? Yes / No

41. If so, give details

42. Did you ever come in contact with syringes and needles in your workplace or anyplace else?

*ADDITIONAL QUESTIONS FOR WOMEN*

43. Do you have any children? Yes / No

44. If yes, how old are they?

45. Where did you have your deliveries (specify name of hosp., clinic, etc)?

46. Did you take any injections during your pregnancy or delivery? Yes / No

47. If yes, how many?

48. Have you taken any injectible contraceptives? Yes / No

49. If yes, how many (use local names/terms for these)?

50. Have you terminated any pregnancies (MTP)? Yes / No

51. If yes, details - (specify name of hosp., clinic, time etc)

52. Have any gynaecological problems that you have had been treated in any way? (specify name of hosp., clinic, time etc)

# Appendix D
# AIDS Case reporting forms

This appendix presents two examples of AIDS case reporting forms that State AIDS Control Societies (SACS) distribute to AIDS case reporting hospitals and other institutions. The first form, developed by NACO, continues to be used by Goa SACS, though new forms have subsequently been developed and are in use by many states. In this form, Table 3 asks for information on routes of transmission. The second form, from Tamil Nadu State AIDS Control Society, was used at least as late as December 2004, but has since been modified; in this form, Table III asks about risk/transmission categories and Table VI gives information on source of infection in Tamil Nadu. (Note: Some of the columns unrelated to routes of transmission are not shown in detail here.)

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## GOA STATE AIDS CONTROL SOCIETY
## AIDS CASE SURVEILLANCE REPORT

**FOR THE MONTH OF_____**

**STATE: GOA**

**1. Morbidity and Mortality data**

| | During the Month | | | During the year | | |
|---|---|---|---|---|---|---|
| | **M** | **F** | **T** | **M** | **F** | **T** |
| **No. of AIDS cases** | | | | | | |
| **No. of AIDS Death** | | | | | | |
| **Children** | | | | | | |
| **Adults** | | | | | | |

**2. Demographic Profile of Newly Diagnosed AIDS Cases**

| **Age groups** | **Urban** | | | **Rural** | | | **All Patients** | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| 0 – 5 years | | | | | | | | | |
| 6 – 14 years | | | | | | | | | |
| 15 – 19 years | | | | | | | | | |
| 20 - 24 years | | | | | | | | | |
| 25 – 29 years | | | | | | | | | |
| 30 – 39 years | | | | | | | | | |
| 40 – 49 years | | | | | | | | | |
| 50+ years | | | | | | | | | |
| Not Specified | | | | | | | | | |
| Total | | | | | | | | | |

## 3. Routes of Transmission for the Newly Diagnosed AIDS Cases

| *(Col.1)* **Age (in Years)/ Sex** | *(Col.2)* **Routes of Transmission Among Newly Diagnosed AIDS cases** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hetero-sexual | Homo-sexual | Blood & Blood Products | Infected Syringe and Needle | Mother to Child Transmission | Others | Not specified | Total |
| 0-14: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| 15-19: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| 20-24: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| 25-29: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| 30-39: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| 40-49: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| 50+: Male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| AgeNA:male | | | | | | | | |
| Female | | | | | | | | |
| Total | | | | | | | | |
| **Total male** | | | | | | | | |
| **Total female** | | | | | | | | |
| **Grand Total** | | | | | | | | |

**4. AIDS Deaths Reported during the Month**

| *(Col.1)* **Age Groups** | *(Col.2)* **Government Hospitals** | | | *(Col.3)* **Private Hospitals** | | | *(Col.4)* **Others** | | | *(Col.5)* **Total** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **M** | **F** | **T** | **M** | **F** | **T** | **M** | **F** | **T** | **M** | **F** | **T** |
| 0- 14 | | | | | | | | | | | | |
| 15- 19 | | | | | | | | | | | | |
| 20 – 24 | | | | | | | | | | | | |
| 25 –29 | | | | | | | | | | | | |
| 30 – 39 | | | | | | | | | | | | |
| 40 – 49 | | | | | | | | | | | | |
| 50+ | | | | | | | | | | | | |
| Age Not specified | | | | | | | | | | | | |
| **Total** | | | | | | | | | | | | |

**5. Symptoms Reported Among All Registered AIDS Cases**
**6. Treatment Services for Opportunistic Infections**

**Place:** **Signature:**

**Date:** **Name & Designation:**

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## TAMIL NADU STATE AIDS CONTROL SOCIETY

AIDS CASES SURVEILLANCE REPORT

Name of the State : TAMIL NADU
Reporting month : DECEMBER 2004

**1. Morbidity and Mortality data**

| | **During the Month** | | | **During the year** | | |
|---|---|---|---|---|---|---|
| | **M** | **F** | **T** | **M** | **F** | **T** |
| **No. of AIDS cases** | | | | | | |
| **-Children** | | | | | | |
| **-Adults** | | | | | | |
| **No. of AIDS Death** | | | | | | |
| **-Children** | | | | | | |
| **-Adults** | | | | | | |

**II. Age/Sex Distribution of AIDS Cases**

| Age in years | Male | Female | Not specified | Total |
|---|---|---|---|---|
| 0 – 5 | | | | |
| 6 – 14 | | | | |
| 15 – 19 | | | | |
| 20 - 29 | | | | |
| 30 – 39 | | | | |
| 40 – 49 | | | | |
| 50 – 59 | | | | |
| 60+ | | | | |
| Not Specified | | | | |
| Total | | | | |

**III. Risk / Transmission Categories**

| ADULT | MALE | FEMALE | TOTAL |
|---|---|---|---|
| Sexual route | | | |
| Through Blood and Blood Products | | | |
| Through infected syringe & needles | | | |
| Others | | | |
| Not specified | | | |
| CHILDREN | | | |
| Perinatal | | | |
| Through Blood and Blood Products | | | |
| Other | | | |
| Not specified | | | |

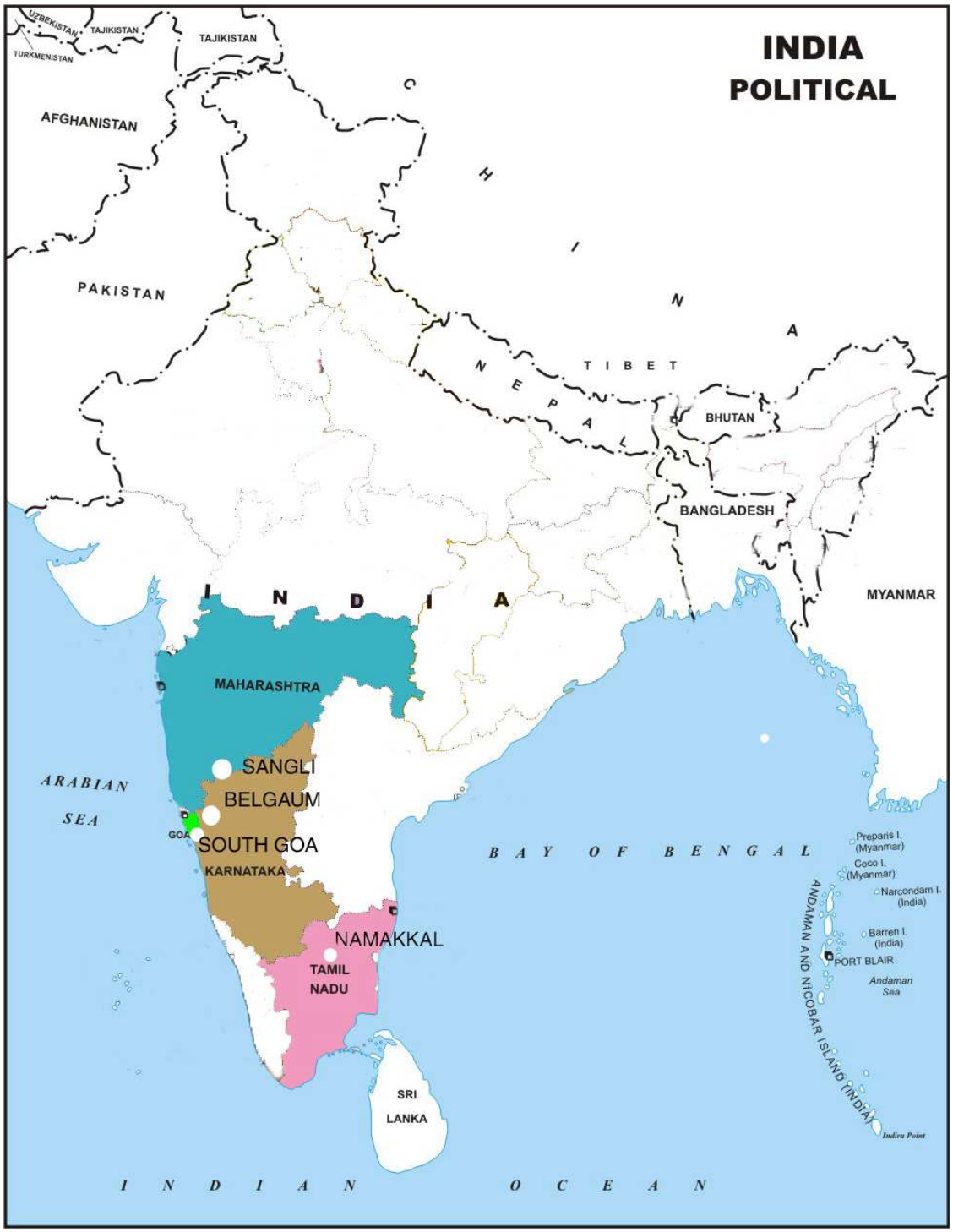
**IV. Frequency of presenting signs and symptoms**

**V. Opportunistic infections**

**VI. SOURCE OF INFECTION IN TAMIL NADU**

| INFECTION | UP TO the Month | % |
|---|---|---|
| Heterosexual Promiscuous | | |
| Homosexual | | |
| Perinatal Transmission | | |
| Blood & Blood Products | | |
| Injectable Drug Users | | |
| Others | | |
| Total | | |

**VII. Age group wise classification**






• Based upon Survey of India map wih the permissiOn of the Surveyor General of India.