

IN FOCUS

MSM and transgender communities: Understanding vulnerability and risk to HIV

As the debate rages in India on whether Section 377 of the Indian Penal Code (Box 1, page 2) should be repealed or not, a study carried out among men who have sex with men (MSM) and transgender persons (TG) in the states of Maharashtra, Andhra Pradesh and Tamil Nadu provides further evidence of their increased vulnerability to HIV/STI.

The study commissioned by IAVI was conducted by Population Council, in collaboration with Action Research Centre in Mumbai, YRG Care in Chennai and Academy for Nursing Studies in Hyderabad. In addition, various community based organisations and members of the MSM and TG groups in Mumbai, Hyderabad, Chennai and Madurai were engaged at different stages of the study design and implementation (Box 2, page 2).

In all, over 140 MSM and TG were interviewed using a modified version of Participatory Ethnographic Evaluation and Research (PEER) method¹, a unique method of training and involving members of the highly marginalised and vulnerable communities to conduct interviews with their peers (Box 3, page 3). An additional 580 MSM and 229 TG participated in the survey across



Findings of the study being discussed at a dissemination workshop in Mumbai

the four study sites. The findings indicate that a majority of MSM and TGs interviewed in the survey were aged less than 30 years and most had completed between primary to secondary level schooling. Thirty four per cent of MSM and 20 per cent of TG were married. Of the married MSM, 90 per cent said they were married to a female partner, while all married TG indicated that their spouse was a male. The majority TG respondents lived with friends and leaders or *Guru* from their community while most of the MSM lived with their families.

¹ Martine Collumbien from the London School of Hygiene and Tropical Medicine, provided training on the PEER Method. Her inputs are gratefully acknowledged.

Continued on page 2 ▶

Also in this issue...**4****Textbook**

Inducing neutralising antibodies

5**In Conversation**

with Yadavendra Singh

7**Watch Glass**

State-of-the-art laboratory

◀ Continued from page 1

Risk perception and risk behaviour

In the three months prior to the survey, a majority of MSM and TGs had sex with a mix of regular and non-regular partners, and one-tenth of MSM and one-fifth of

BOX 1

What is Section 377 IPC?

Section 377 of the Indian Penal Code also referred to as the Anti-Sodomy Law was introduced in India in 1860. It states: "Whoever voluntarily has carnal intercourse against the order of nature with any man, woman or animal shall be punished with imprisonment for life, or with imprisonment of either description for a term which may extend to ten years and shall also be liable to fine. Explanation: Penetration is sufficient to constitute the carnal intercourse necessary to the offence described."

A Public Interest Litigation (PIL) Petition challenging Sec 377 is being heard at the Delhi High Court.

The contention is that the law criminalises sexual activity between consenting adults in private, thereby violating the fundamental and human rights of thousands of Indian citizens and legitimising, in the eyes of the law and society, discrimination, violence, and social prejudice against gay, lesbian, bisexual, hijra communities, and other sexual minorities. The Section also prevents them from accessing justice and has been used to harass and blackmail them. It casts a shadow of illegality on their personal lives, stopping them from being open about their status and living with dignity. Moreover, it prevents adequate health services, especially HIV/AIDS prevention efforts being catered to the special needs of the sexual minorities.

India's Health and Family Welfare Minister Anbumani Ramadoss has been in favour of removing Section 377, which he says is impeding the Government's AIDS control measures.

TGs reported their sexual partners were only regular male partners. Close to half of both the MSM and TGs reported sex with more than one partner the last day they had sex prior to the survey. When asked about their last three sexual partners, for about one-fifth of MSM, the types of sexual partners included both male and female, while TGs reported sex with only male partners. Almost half of MSM and TGs mentioned having sex with their last three partners in public spaces such as parks, public toilets, railway stations and bus stops.

In the survey, one-fifth of MSM and one-third of TGs reported inconsistent or non-use of condoms for receptive anal sex with their last three partners. Some of the commonly mentioned reasons during qualitative interviews for not using condoms included "having sex in public spaces doesn't allow for condom use", "we are in a hurry to finish it off and don't have time to negotiate", "in dark places at night, it is difficult to know if partner is using condoms" or "when we have had too much to drink". Very often customers also paid more money for not using condoms. Many, on the other hand, reported not using condoms with their lovers/husbands ("we love and respect them"), first time customers ("we want them to come back"), "handsome/good looking customer", and, "clean and rich looking customer". More TGs than MSM reported use of lubricants, such as oil based creams and lotions that can also damage condoms.

The fact that sex work was often reported as the only, or an additional source of income, by 50 per cent of MSM and 80 per cent of TG respondents in the survey, highlights another layer of risk and STI

“Stigma and discrimination experienced from health care providers in the public hospitals dissuaded many of them from using the services.”

and HIV vulnerability. The threat of violence, stigma, alcohol use, and mobility further accentuated risk. About one-fifth of the respondents mentioned they experienced forced sex in the three months preceding the survey. Perpetrators of this violence included police, "goons", clients and sometimes partners. As explained by one respondent in the qualitative interview, "If we get caught by the police and don't pay them they keep us in jail and force anal sex with us. Even other prison inmates force us to have sex. Also, many times goons come and snatch the money away from us and force us to serve (have sex) them."

BOX 2

Community Based Groups Consulted

Hyderabad (Andhra Pradesh)

MITHRUDU
SURAKSHA

Mumbai (Maharashtra)

Humsafar Trust
Astitva Trust
Dai Welfare Society
Sakhi Char Chowgi Trust
Sambhavana Society
Udaan Trust
Humsaya Society

Chennai and Madurai (Tamil Nadu)

SAHODARAN
Social Welfare Association for Men
Tamil Nadu Aravani Association
Gokulam

Alcohol use prior to sex was reported by almost half of the sample population. Out-of-town travel in the six months prior to the survey was reported by two-thirds of MSM and TGs and more MSM reported they had sex during their last outstation trip. During these sexual encounters, a large proportion of MSM and TG respondents reported condoms were not always used and alcohol was consumed.

Access to health care

One-fourth of the respondents reported one or more STI symptoms. MSM generally sought treatment in NGO clinics while

BOX 3

The PEER way of study

The study used the modified version of Participatory Ethnographic Evaluation and Research (PEER) method for conducting the interviews. Two levels of researchers were involved- the Peer Ethnographic Researchers (PERs) were recruited from the MSM and TG communities whereas the supervisor were the trained social science researchers.

In each study site, the NGO/CBOs having links with MSM and TG communities selected six to eight PERs from each community. PERs were selected for their knowledge about their community and their willingness and ability to communicate effectively and not because they held any official position with the NGOs/CBOs.

PERs were extensively trained using participatory methods to collect in-depth information on the everyday realities of people from their own communities using third-person conversational style techniques. Social scientists in turn interviewed PERs on key thematic areas. PERs were also engaged in the analysis and interpretation of data.

The complex issue of identity

Self identity emerged as a key social issue. In the larger society, 93 per cent of MSM identified themselves as 'male' and 69 per cent of TG identified themselves as transgender and the remaining as female. Majority of MSM however mentioned at least two or more identities that they used within their own communities. A large majority of them identified themselves as either one or two types of *kothi*, (the term used to refer to feminised men) - *khada kothi/pant-shirt kothi or/and saathla/saree-wearing kothi* followed by one-third who identified themselves as MSM, one-fourth as *double decker* (local term for man who participates in both penetrative and receptive sex), one-tenth as *panthi* (local term for the penetrative partner) and less than one-tenth termed themselves as gay.

Majority of the MSM living with their family members, had hidden their sexual identity, sexual behavior and income sources from their family members. "My family does not know about my identity. Only my friends who work with me know about it," said a MSM who operates as a sex worker in Mumbai.

Half of the TG respondents in the study identified themselves as *nirwana* (had undergone operation for castration) and over one-third termed themselves as *akwa* (had not undergone castration and had retained the male genitalia).

TGs went to public sector hospitals as these provided 'free' services. Stigma and discrimination experienced from health care providers in the public hospitals however dissuaded many of them from using these services. Findings from the qualitative interviews suggest that as a result of discrimination many turned to the local unqualified providers or even used a friend's prescription for treatment.

While both respondent subgroups were well aware of HIV prevention services about half of MSM and TGs said they were at "no risk" of contracting HIV. Interestingly, in the two years prior to the survey, 85 per cent of TG respondents reported undergoing an HIV test compared to 67 per cent of MSM.

Participation in AIDS prevention research

While little over half of MSM and two-thirds of TGs agreed to participate in HIV prevention research, both expressed concerns as their participation could further

stigmatise them. The majority of MSM willing to participate in the study said they should be contacted through an NGO or their peers followed by being contacted directly on their cell phones. For TGs, the most preferred mode of contact was through their Guru

“While both respondent subgroups were well aware of HIV prevention services, about half of MSM and TGs said they were at “no risk” of contracting HIV.”

and then an NGO. Members from both communities offer several opportunities for outreach and engagement for AIDS preventive research studies.

This study has highlighted multiple factors operating at various levels in accentuating the vulnerabilities and HIV risk

Continued on page 6 ►

TEXTBOOK

Understanding approaches to inducing neutralising antibodies

By Regina McEnery

When viruses and bacteria invade the body, the human immune system fights back in two ways. Initially, the innate immune responses are activated. These responses are always on standby and can act quickly against any pathogen to either eradicate or help limit an infection.

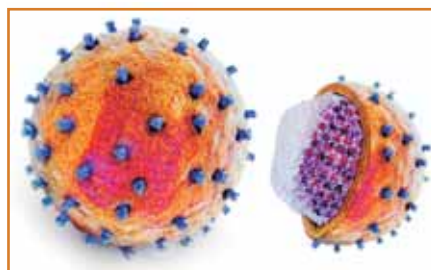
The adaptive immune responses, which include both antibody and cellular immune responses, are the second line of defense. Antibodies are Y-shaped proteins that work primarily by latching onto viruses, like HIV, and preventing them from infecting their target cells. Antibodies that can effectively neutralise many different forms of HIV are referred to as broadly neutralising antibodies. Cellular immune responses act against cells once they have already been infected by HIV.

Unfortunately, while several AIDS vaccine candidates are able to induce cellular immune responses against HIV, none of the candidates tested so far have been successful at inducing neutralising antibody responses. This is one of the major scientific obstacles to the development of a preventive AIDS vaccine.

Identifying neutralising antibodies

To find broadly neutralising antibodies against HIV, researchers closely study the immune responses in HIV infected individuals. Although most HIV-infected people do develop antibody responses against HIV, very few of them are actually capable of neutralising or inactivating the virus. So far only about five broadly neutralising antibodies against HIV have been identified. And even

though these antibodies have been well studied and characterised, researchers still do not know how to induce them through vaccination. Solving this problem requires figuring out which non-infectious fragment of HIV, known as an immunogen, will stimulate the immune system in such a way that it produces one of these broadly neutralising antibodies. But this has proven difficult. Designing immunogens that can induce neutralising antibodies against HIV is a major area of focus in AIDS vaccine research.



A novel approach

Meanwhile, a subset of investigators is taking a different approach. Studies have shown that injecting large quantities of one of the already identified broadly neutralising antibodies against HIV directly into nonhuman primates can protect them from infection with a virus that is a cross between HIV and simian immunodeficiency virus (SIV) - the monkey equivalent of HIV - known as SHIV. If the antibodies are present in a sufficient quantity when the animal is exposed to SHIV, they are capable of blocking an infection. Scientists have also observed that infusing antibodies into people infected with HIV temporarily suppresses their viral loads - the amount of HIV in the blood - when antiretroviral therapy is interrupted. This suggests that if broadly neutralising antibodies were induced in humans at sufficient levels,

they might be able to fend off an infection. However, regularly administering enough of the broadly neutralising antibody into humans to protect them against HIV would be impractical, both logistically and economically, over the long term. So rather than introducing the antibody itself, some researchers are instead trying to administer the gene that could direct the body to make the broadly neutralising antibody. Within a cell, genes are responsible for overseeing the production of proteins, including antibodies. So by introducing the gene for a broadly neutralising antibody into a cell, researchers are hopeful that the body's own cells would do the work, producing a continuous supply of antibody.

Like other vaccine strategies that use non-infectious viruses to deliver fragments of HIV to the immune system, researchers are using a crippled virus as a vector to chauffeur the antibody genes into human cells. So far this strategy has provided encouraging preclinical results. In studies with non-human primates, the vaccination resulted in production of neutralising antibodies that researchers could detect a year later. Even more encouraging, the antibody did appear to be effective at blocking infection against SIV in some of the vaccinated monkeys.

Researchers are now conducting additional preclinical studies to try to determine what quantity of antibody needs to be produced to provide protection and whether the antibodies will be present in mucosal tissues, which are the primary entry point for HIV during sexual transmission. ■

The article originally appeared in the Nov. 2008 issue of VAX, available at iavireport.org

IN CONVERSATION**"Work on MSM/TG issues needs to be done in smaller towns and rural areas"**

Yadavendra Singh, popularly known as Rahul, is the Programme Coordinator and Trainer of Milan, the MSM/TG Programme at Naz India. He is actively involved in counselling MSM/TG and their families on psycho social issues. He also helps in arranging legal assistance for the community on discrimination. Rahul has presented papers on the rights of MSM/TG community, health issues, Section 377 IPC at international conferences. He won the Staying Alive Foundation Award in 2006 for his work with truck drivers in Delhi. Sankalp spoke to him.

At the recent Mexico Conference, many organisations voiced the growing need to fund HIV research on MSM and TG groups to improve prevention, treatment, care, and support to this vulnerable population. What is the state of such research in India?

Research plays an important role in programme planning and implementation. Therefore, demanding more research in this field is completely appro-

priate. Research will help in identifying various underlying causes and vulnerabilities related to sexual behaviour/identities and STIs and HIV/AIDS. Mental health issues of MSM/TG, relationship between sexual behaviour and identities, violence in the same sex relationships and its connection with HIV, and research related to care and support for positive MSM/TG need attention.

Tell us about some work done by your organisation.

The Naz Foundation (India) Trust is a Delhi based NGO committed to raising awareness to prevent the spread of HIV and providing support to those living with the virus and affected by it, with sensitivity and utmost confidentiality.

Advocacy is integral to all the programmes at Naz India. The organisation coordinates and conducts trainings and workshops on the issues related to HIV/AIDS and sexuality. It has developed various manuals on MSM/TG issues like HIV/AIDS, sexuality, testing, counselling and peer education for young people.

Why are organisations working with MSM and TG groups challenging Section 377 in court?

The Section came into force in 1860 when India was a British colony (See Box on Section 377 on page 2).

The section is an abusive tool in the hands of the law enforcement agencies. They use it to harass and blackmail the LGBT (Lesbian, Gay, Bisexual and Transgender) community.

Naz India filed a petition in the Delhi High Court challenging the constitutional validity of Section 377 in December 2001 seeking to "read down" this section so as to exclude consensual sexual activities between adults in private from criminal purview. The petition does seek to repeal Section 377 because in absence of adequate laws dealing with child sexual abuse, the section is often used. Section 377 has been challenged on the grounds that it violates certain fundamental rights guaranteed to all citizens of this country under the Indian Constitution, like the right to equality (Article 14), the right to non-discrimination (Article 15), the right to freedom of speech and expression (Article 19) and the right to life and liberty (Article 21).

The case is sub judice in the Delhi High Court.

What are the challenges faced by HIV prevention workers in reaching out to MSM and TG groups as a consequence of the Section 377?

The National AIDS Control Organisation, in its affidavit filed in the Delhi High Court in response to the Naz India petition, recognises the existence of MSM/TG populations and maintains that "Section 377 adversely contributes to pushing the infection underground...making the risky sexual practices go underground and unnoticed". Further, the affidavit states that "the hidden nature of such groups leads to poor access to healthcare and safer sex information".

Continued on page 6 ►

◀ *Continued from page 3*

among MSM and TG populations. Non-stigmatising attitudes and practices, and inclusion of MSM and TG social structures should form the essential basis for an effective HIV prevention and care programme.

At the same time, efforts should be made to use innovative research methods that can ensure representative sampling of MSM and TG for surveys. There is still a large proportion of this population that is 'invisible' and does not self-identify themselves, and some are inaccessible due to rigid social structures of their community. The survey sample for this study must then, be viewed as representative of a subset of visible and self-identifying MSM and TG population who were accessible to the researchers. ■



The participants at the dissemination workshop in Chennai

The authors' affiliations at the time of the study implementation -

Vaishali Sharma Mahendra and Ravi K Verma, Population Council, New Delhi

Sagri Singh and Sushma Kapoor, International AIDS Vaccine Initiative, New Delhi and New York

Shankar Talwar, Action Research Centre, Mumbai

M Prakasamma, Academy of Nursing Studies, Hyderabad

K Srikrishnan, YRG CARE, Chennai

Ernest Noronha, Consultant, Population Council

◀ **In Conversation**

Continued from page 5

The intervention programmes working with the marginalised sexualities have various components like condom distribution, support group meetings, counselling, information on safer sex practices, but these activities may be seen as abetting and aiding a criminal act under Section 377. MSM/TG specific IEC (Information Education Communication) and BCC (Behaviour Change Communication) materials are labelled as "criminally obscene".

Our experiences indicate that outreach workers who are from the MSM/TG communities often face harassment during the field outreach activities from the police and local goons on the grounds of "promoting homosexuality" and "looking different".

Though NACO runs programmes on MSM/TG interventions there are no public awareness messages addressing MSM/TG.

Section 377 legitimises stigma associated with marginalised sexualities and thereby prevents them from accessing existing HIV/AIDS prevention and continuum of care services. Also the nature of sexual acts, due to fearing criminal liability, are often hurried and anonymous with absolutely no time for negotiating safer sex and thereby adding to the vulnerability of HIV infection.

Do you feel that the greater openness of alternative sexualities in India seen recently could lead to a dramatic change in societal acceptance of LGBT people in India?

In the last few years one can perceive certain openness regarding alternate

sexualities in India through the media, panel discussions, film festivals and pride marches. Also more people are coming out and talking openly about their lives.

But these changes are happening primarily in the metros, and homosexuality is still perceived to be an urban/western phenomenon and a 'deviant' behaviour.

For majority of the LGBT people, fear permeates every aspect of their life. They face constant stigma from society in various forms – denial of their rights and jobs, discrimination at the workplace and in the hospitals, perception of same sex relationships as "unnatural", etc.

Much of the work around MSM/TG issues has been done in the bigger cities. A lot needs to be done in smaller cities and rural areas. ■

WATCH GLASS**World's first HIV neutralising antibody centre to be set up**

The International AIDS Vaccine Initiative (IAVI) will invest \$30 million to support the creation of a centre devoted exclusively to designing vaccines to prevent HIV infection.

The centre in collaboration with the Scripps Research Institute (SRI), one of the world's largest independent and non-profit biomedical research organisations, will be located at the institute's premises in California. It will be linked to a network of research institutions in Africa, Asia, Europe and the U.S.

The first-of-its kind centre will comprise multidisciplinary scientific teams, and bring a critical mass of structural biologists, virologists, chemists, immunologists

and computational biologists together to work side-by-side.

The centre will link to an expanded international scientific consortium, known as the Neutralising Antibody Consortium (NAC). The centre and broader NAC will collaborate closely with many levels of IAVI's research programme. For example, leading concepts identified by the NAC scientists will be rapidly translated into clinical candidates for human testing at IAVI's AIDS Vaccine Development Laboratory in New York.

"Collaboration is essential to making things happen, so the more we bring people together to promote scientific interaction, the more rapid our progress

will be towards the creation of an effective AIDS vaccine," said Dennis Burton, Professor at the Scripps Research Institute's Department of Immunology and Microbial Science and Scientific Director of IAVI's NAC.

In recent years, researchers have successfully crystallised several broadly neutralising antibodies to HIV, determined their structures down to the atomic level, and used this information to get a handle on how each disables HIV. They are now applying what they have learnt to develop immunogens that, when delivered as vaccines, will reliably induce these antibodies in all people, with the goal of preventing HIV infection.

State-of-the-art laboratory for AIDS vaccine design and development opens

A new AIDS vaccine design and development laboratory – a 36,000 square foot, state-of-the-art facility opened in New York City in November. IAVI's Design Lab is the only facility in the world to be dedicated exclusively to the design and development of an AIDS vaccine and is housed within a planned new bioscience centre at the historic Brooklyn Army Terminal

Scientists at the Design Lab, together with partners in academia, the private sector and government, will design, compare, prioritise and advance promising AIDS vaccine strategies. The Design Lab is the latest addition to IAVI's global AIDS vaccine discovery network. The programmes

at the lab will complement those IAVI has with both the private sector and academic partners throughout the world.

"With 7,500 people around the globe becoming newly infected with HIV every day, it's clear that current prevention and treatment efforts, while critical, are not going to end the AIDS pandemic," said Dr. Seth Berkley, President and CEO of IAVI. "We need a vaccine to bring an end to AIDS. I am hopeful that scientists



at IAVI's Design Lab, working together with partners around the world, will develop a new generation of AIDS vaccine candidates that will bring us closer to our goal of a world without AIDS."

Continued on page 8 ►

◀ Continued from page 7

An estimated 33 million people are living with HIV around the world today, a number equivalent to the populations of New York, Delhi, Lagos and London combined. AIDS is the fourth leading cause of death in the world and is number one in sub-Saharan Africa. A vaccine, even a partially effective one, remains the world's best hope for turning the tide on the pandemic


Nobel Prize for HIV discoverers

French researchers Franoise Barr-Sinoussi and Luc Montagnier hailed for the discovery of the human immunodeficiency virus, or HIV, have been awarded the 2008 Nobel Prize in Medicine.

They share the prize of 10 million kronor, or \$1.4 million, with the German scientist, Harald zur Hausen, who was cited for finding human papilloma viruses that cause cervical cancer, the second most common cancer among women.

In its citation, the Nobel Assembly said Barr-Sinoussi's and Montagnier's discovery had led to the current understanding of the biology of AIDS and its antiretroviral treatment. Their work in the early 1980s made it possible to clone the HIV-1 genome.

"This has allowed identification of important details in its replication cycle and how the virus interacts with its host," the citation said. "Furthermore, it led to development of methods to diagnose infected patients and to screen blood."



IAVI launches Video Commitments Project on World AIDS Day 2008

On the 20th anniversary of World AIDS Day, the International AIDS Vaccine Initiative (IAVI) invites individuals from around the world to show their support for the development of an AIDS vaccine by contributing their voices to a new gallery of video clips about why the world needs such a vaccine.

Available at www.iavi.org/Commitments, the collection of 20 to 40-second videos captures the personal testimonies of ordinary individuals, activists, community workers, scientists and politicians who have been moved in some way by the impact of the AIDS pandemic. Individuals are encouraged to film and submit for posting on IAVI's website their own videos about why the world needs an AIDS vaccine.

The first World AIDS Day, established by a group of international health ministers in 1988, was dedicated to raising awareness about HIV. Twenty years later, the agenda is considerably more ambitious. This year's official slogan is "Stop AIDS. Keep the Promise."

With 33 million people on the planet living with HIV, and 7,500 people infected with the virus daily, it is clear that far more needs to be done to stop AIDS. Progress has been made getting life-prolonging antiretroviral treatments to those infected with HIV, and that progress must continue. But for every two people put on antiretroviral therapy, five people become newly infected with HIV. We need to prevent people from becoming infected in the first place.

IAVI gratefully acknowledges the generous support provided by the following major donors.*



Alfred P. Sloan Foundation
Basque Autonomous Government
Section, Dickinson and Company (BD)
Bill & Melinda Gates Foundation
Bristol-Myers Squibb (BMS)
Broadway Cares/Equity Fights AIDS
Canadian International Development Agency
Continental Airlines
European Union
Foundation for the National Institutes of Health
Google Inc.
The Haas Trusts
Henry Schein, Inc.
Irish Aid
James S. Pendleton Charitable Trust
The John D. Evans Foundation
Kathy Bole & Paul Klingenstein
Merck & Co., Inc.

Ministry of Foreign Affairs and Cooperation, Spain
Ministry of Foreign Affairs of Denmark
Ministry of Foreign Affairs of The Netherlands
Ministry of Foreign Affairs of Sweden
The New York Community Trust
Norwegian Royal Ministry of Foreign Affairs
Pfizer Inc.
The Rockefeller Foundation
Swedish International Development Cooperation Agency
U.K. Department for International Development
Ustil Thern's a Cure Foundation
The U.S. President's Emergency Plan for AIDS Relief through the U.S. Agency for International Development
The William and Flora Hewlett Foundation
The World Bank through its Development Grant Facility

And many other generous individuals from around the world.

* As of 04/08

CONSULTING EDITOR Shree Venkatram; EDITORIAL ADVISOR Mark Chataway. For subscriptions e-mail to: sankalp@iavi.org; or write to Sankalp D-64, Second Floor, Defence Colony, New Delhi - 110024, INDIA. Tel: 91-11-2465 2668/9, 2461 0761/2; Copyright © 2003 All rights reserved; For private circulation only.

IAVI is a scientific organisation founded in 1996 whose mission is to ensure the development of safe, effective, accessible, preventive AIDS vaccines for use throughout the world. IAVI focuses on four key areas: accelerating scientific progress; education and advocacy; ensuring vaccine access and creating a more supportive environment for industrial involvement in AIDS vaccine development.

IAVI Report  Access other IAVI publications at www.iavi.org 

◀ Continued from page 4