



**WORLD HEALTH ORGANIZATION**  
**Regional Office for the Western Pacific**

**MINISTRY OF HEALTH MALAYSIA**  
**DEPARTMENT OF PUBLIC HEALTH**

# STI/HIV



**CONSENSUS REPORT ON**  
**STI, HIV AND AIDS EPIDEMIOLOGY**  
**MALAYSIA**

April 2001

**CONSENSUS REPORT ON STI, HIV AND AIDS**  
**EPIDEMIOLOGY: MALAYSIA**  
**2001**

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## **ABBREVIATIONS AND ACRONYMS**

AIDS	acquired immunodeficiency syndrome
ANC	antenatal clinic attendees
BSS	behavioural surveillance survey
ELIZA	enzyme-linked immuno-sorbent assay
FSW	female sex workers
HIV	human immunodeficiency virus
HSS	HIV sentinel surveillance
IDU	injecting drug users
IMR	Institute of Medical Research
MSM	men who have sex with men
NARL	National AIDS Reference Laboratory
PCR	polymerase chain reaction
RPR	rapid plasma reagin
STD	sexually transmitted disease
STI	sexually transmitted infection
SW	sex workers
TPHA	treponema pallidum haemagglutination assay
UNAIDS	Joint United Nations Programme on HIV/AIDS



## EXECUTIVE SUMMARY

The present HIV/AIDS surveillance system in Malaysia is based on reporting of infections/cases and HIV testing of women attending antenatal clinics, blood donors, STD patients and tuberculosis inpatients as part routine HIV screening activities.

By the end of 2000, the cumulative number of HIV infections reported to the Ministry of Health was 38 340 cases, of which 4722 were AIDS cases. Most of the AIDS cases (65.9%) and HIV-infected persons (81.5%) are males. During 2000, the majority of reported AIDS cases (63.9%) and HIV-infected persons (74.7%) contracted their infection through injecting drug use. HIV prevalence among IDUs is still increasing (rate of reactive samples at screening sites was 0.1% in 1988, 17.6% in 1997 and 24.9% in 2000). HIV prevalence in antenatal mothers and blood donors is less than 0.1%. In 2000, among 285 000 antenatal women tested, only 0.03% were found to be HIV-positive. Among 330 000 blood donors tested in 1999, only 0.01% were positive. There is evidence that HIV prevalence among STD patients and female sex workers (FSW) in Kuala Lumpur is increasing. HIV prevalence rates among FSW and STD patients in selected urban areas are beginning to exceed 5%. However the average HIV prevalence throughout the country in these high-risk behaviour groups is less than 5%. There are very few behavioural data related to HIV/AIDS and STIs.

The number of current HIV infections has been estimated to be 42 000 in 2000 (range: 30 000- 81 000). The population sizes of HIV-risk behaviour groups and the representativeness of surveys needs to be reassessed.



## INTRODUCTION

The population of Malaysia is estimated (Malaysia Department of Statistics for the year 2000) to be 23 263 000, with a male to female ratio of 1.05:1. The estimated population of 15-49 year-olds is 12 622 000 (54.2%). Malaysia is divided into 14 states (2 on the island of Borneo and 12, including Kuala Lumpur Federal Territory in Peninsular Malaysia) and 131 health districts. Approximately 51% of the population lives in the urban areas.

HIV infections have been notifiable in Malaysia since 1985. Besides the reporting system for HIV/AIDS cases, HIV surveillance in Malaysia is also closely related to routine screening programmes, aimed at detecting HIV infection at an early stage. The HIV sentinel surveillance (HSS) was established in 1994, but was discontinued at the end of 1997 as the HSS target groups were included in the routine screening activities in 1998.

There are very few data on behaviour related to HIV/AIDS and STIs.

A consensus workshop, held in 1999, estimated the average HIV prevalence in Malaysia to be 41 000 in 1998.

In order to reassess the HIV/AIDS situation, the Ministry of Health of Malaysia, with support from WHO, organized a workshop in Kuala Lumpur in April 2001, with the following specific objectives:

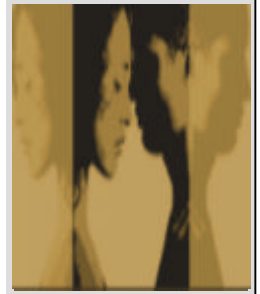
- to review available data on HIV/AIDS, STIs and relevant behavioural factors in Malaysia;
- to identify the STI/HIV/AIDS trend;
- to make estimates and projections based on existing data;
- to reach a consensus on the situation; and
- to recommend improvements to the current AIDS/STI surveillance system, and appropriate future interventions.



## METHODOLOGY

Data collected and compiled before the workshop were distributed to the workshop participants. Participants were selected on the basis of their experience in surveillance activities and other activities related to HIV/AIDS (see Annex).

Sub-groups were organized to review and discuss the STI/HIV/AIDS situation, factors influencing the HIV epidemic, and the estimation of HIV prevalence in 2000. The groups presented the results of their discussions in a plenary meeting. The strengths and weaknesses of the current surveillance system were analysed and recommendations for future improvements were made.



## EPIDEMIOLOGICAL STATUS

### **HIV/AIDS**

#### **Data sources:**

##### **1. HIV/AIDS case reporting:**

HIV infections and AIDS cases are reported to the District Medical Officer of Health. Compiled reports, without patients' identities, are then submitted to the AIDS/STD Unit at state level, where the information is combined before being submitted to the National AIDS/STD Unit of the Department of Health, Ministry of Health. All reported cases are confirmed cases, identified through routine screening sites as well as government and private hospitals. Information collected includes age, sex, date and place of occurrence, associated risk factors and actions taken against the spread of the disease.

##### **2. HIV sentinel surveillance (HSS)**

HSS was piloted in 1993 in four states, Kelantan, Johor, Perlis and Sabah. From 1994 to 1997 it was implemented through out the country among STD patients, tuberculosis patients and antenatal mothers. One STD clinic, one tuberculosis clinic and one antenatal clinic per state were chosen (with a total of 14 x 3 sites) in each states, with a planned sample size of 400 per group per site.

##### **3. HIV screening:**

There are 54 HIV screening centres throughout the country, with at least one centre per state. All screening centres are in government hospitals. The Institute of Medical Research (IMR) in Kuala Lumpur functions as the National AIDS Reference Laboratory (NARL) for the country. HIV testing is also carried out by various private medical practitioners and private laboratories. All HIV-testing activities are required to be accompanied by pretest and posttest counselling.





Screening is routinely conducted among blood donors and transfusion-dependent patients, such as those with thalassemia, haemophilia or leukemia. High-risk groups, such as IDU, people with multiple sexual partners, sex workers, homosexuals and bisexuals, clients of prostitutes, patients suffering from sexually transmitted diseases, tuberculosis patients, as well as the partners and contacts of the above people admitted to government hospitals, are also screened for HIV. Screening of high-risk groups is also undertaken in correctional institutions, such as drug rehabilitation centres, prisons, and refuge homes for wayward girls. Since a number of HIV tests are carried out on an unlinked anonymous basis, an undefined, but probably at least 10% of positive HIV-tests represent duplicate or even multiple positive tests for the same person.

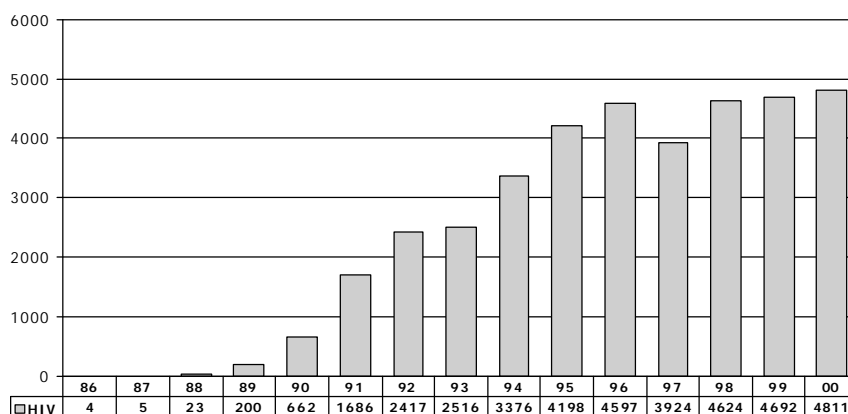
The initial screening is done using the ELISA (enzyme-linked immunosorbent assay) test at the screening centres. All reactive samples are re-tested using the particle agglutination (PA) test. Samples reactive to both ELISA and PA are requested to submit fresh samples for confirmation. Those in high-risk groups are confirmed locally using ELISA and PA test, while those having indeterminate results and in lower-risk groups are sent to the Institute of Medical Research (IMR) for supplementary and confirmatory tests using blotting assay. All screening procedures are done based on WHO guidelines. HIV screening/HIV testing is performed using the protocol and methods with various strategies (Strategy I, Strategy II and Strategy III), recommended by WHO.

### **Summary**

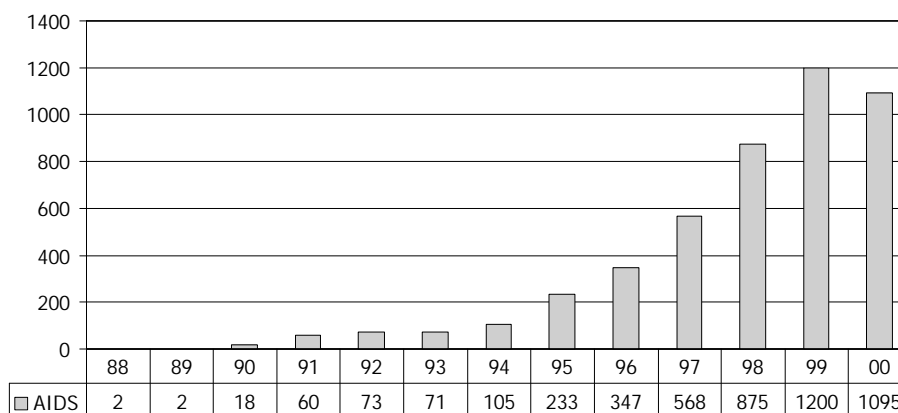
By the end of 2000, the cumulative total of HIV infections reported to the Ministry of Health was 38 340 cases, of which 4722 were AIDS cases (see Figures 1 and 2).



**Figure 1 - Reported HIV infections by year  
Malaysia, 1986-2000**



**Figure 2 - Reported AIDS cases by year  
Malaysia, 1988-2000**

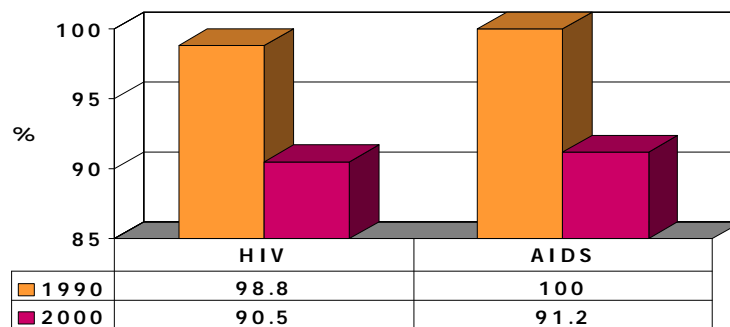


Most of the AIDS cases (65.9%) and HIV-infected persons (81.5%) are males, and within the 20-40 age group (see Figures 3 and 4). By ethnicity, the majority of the reported HIV-infected individuals are Malays (72.3%), followed by Chinese (15.4%), Indians (8.8%), other minor ethnic group (0.9%) and foreigners (2.5%).

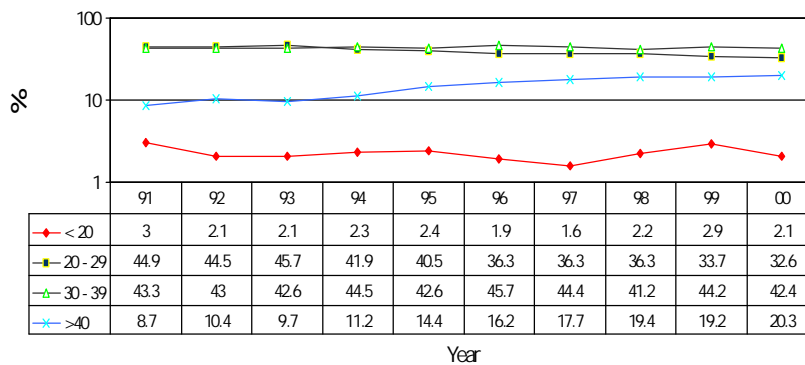




**Figure 3 - Proportion of males, reported HIV infections and AIDS cases  
Malaysia, 1990 and 2000**

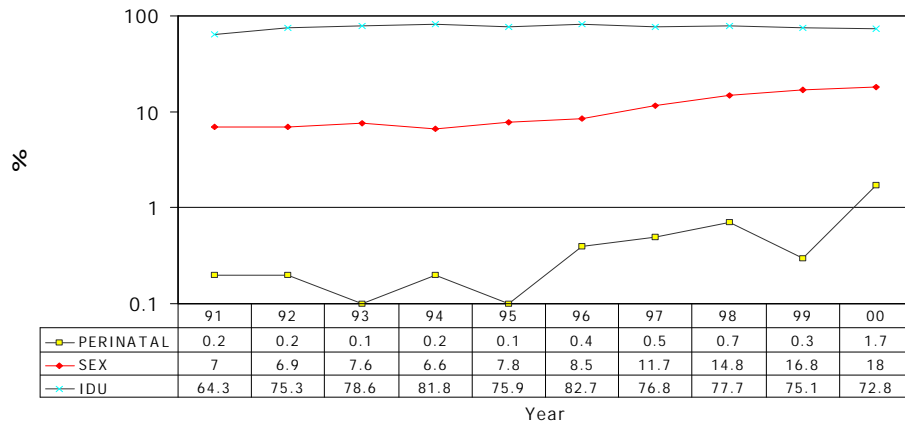


**Figure 4 - Percentage of reported HIV cases by  
age group, Malaysia, 1991-2000**



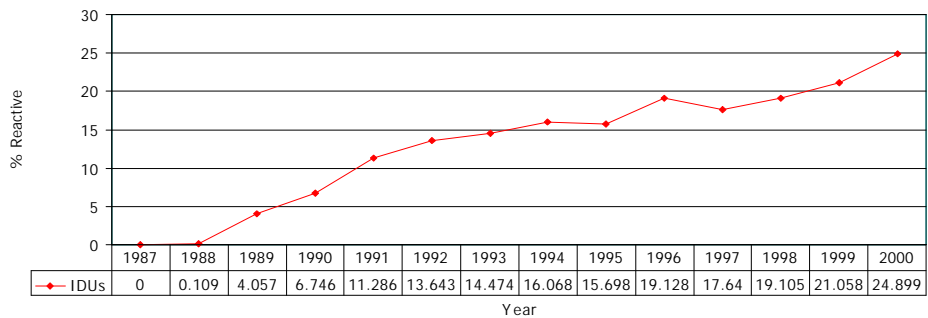
The majority of the reported AIDS cases (59.6%) and HIV-infected persons (76.1%) contracted the infection through injecting drug use. Injecting drug use has always been the predominant risk category of reported HIV infections in the past year (See Figure 5). Transmission through sexual intercourse, as a cumulative total of cases, accounted for 25.0% of the AIDS cases and 11.7% of the HIV-infected persons.

**Figure 5 - Percentage of reported HIV cases by risk category, Malaysia, 1991-2000**



However, it is difficult to conclude definitively that the epidemic among IDUs has stabilized. The percentage of blood samples taken during routine screening at screening sites which show reactive reaction to HIV (samples reactive) have continued to increase, from 0.1% in 1988, to 21.1% in 1999 and 24.9% in 2000. HIV prevalence rates among drug users have fluctuated in recent years; 13.8% (n=9811) in 1998, 17.5% (n=5533) in 1999, 16.4% (n=6838) in 2000. It is assumed that 65% of drug users are IDU, based on results of a study reported in 1999. Therefore, HIV rates amongst IDU were 21% in 1998, 27% in 1999 and 25% in 2000 (see Figure 6, Table 1).

**Figure 6 - Percentage of IDUs reactive for HIV by year Malaysia, 1987-2000**



**N. of samples**

1987: 1,057	1991: 8,657	1995: 12,645	1999: 18,895
1988: 916	1992: 15,099	1996: 26,595	2000: 19,500
1989: 1,750	1993: 18,226	1997: 18,288	
1990: 7,901	1994: 23,544	1998: 27,150	



**Table 1: HIV prevalence rates among IDUs screened by year in Malaysia, 1997-2000**

Year	Number of drug users (DU) tested	Number of IDU tested (estimated to be 65% of DU)	Number of confirmed cases	Prevalence rate among DU	Prevalence rate among IDU
1998	9811	6377	1354	13.8%	21.2%
1999	5533	3597	965	17.5%	26.8%
2000	6838	4445	1122	16.4%	25.2%

HIV-positive IDU are among the sexually active population, and some of them are married. They are, therefore, a potential source for the spread of HIV either through sexual intercourse or through the sharing of needles. HIV can be transmitted to their wives and subsequently to their babies.

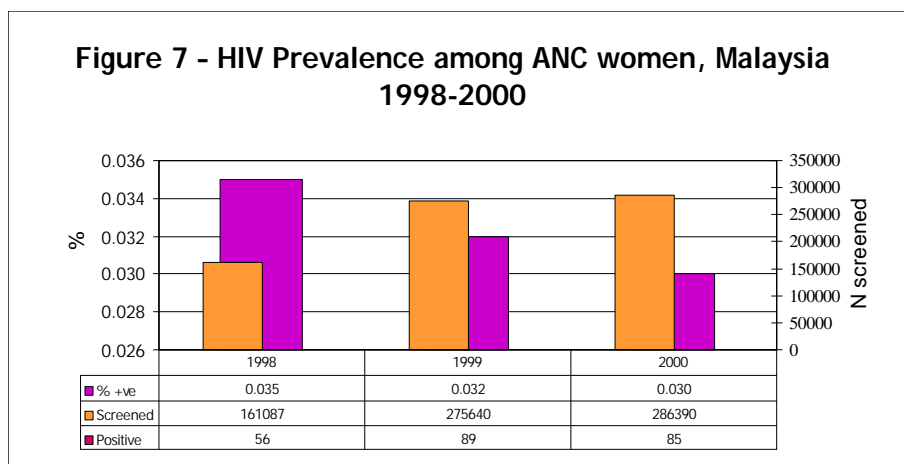
Prevalence data by year among groups at high risk of sexual transmission, such as sex workers and STD patients, were not analysed separately. These groups were combined in one group, called sexually related samples, which also includes bisexuals, MSM, heterosexuals and transvestites, etc. The data were reported with the percentage of reactive samples among screened samples. Information from screening centres showed that the percentage of reported HIV infections among sexual groups has shown an upward trend in recent years (see Figure 5).

The nationwide HIV trends among these high-risk sexual groups have not been not completely identified. One data source showed that the proportion of blood samples reactive to HIV antibodies among female sex workers rose from 1.4% in 1991 to 9.34% in 1998 [AIDS/STD Section, Annual report, 1999]. In Kuala Lumpur, among female sex workers, no difference in HIV prevalence rates was found between 1996 (6.3%, HSS among 1033 FSW), and 2000 (6.5%, study among 72 FSW); while among male commercial sex workers, these prevalence rates increased from 0 in the HSS in 1996 (among 73 male sex workers) to 13.9% in a study in 2000 (among 136 male sex workers).

Average HIV prevalence among the population considered to be at low risk for HIV infection in 2000 was less than 0.1% (see Figures 7 and 8); 0.024% among blood donors in 1999 (81 confirmed by EIA+PA+LIA among 334 459 blood donors), and 0.03% among ANC women in 2000 (85 confirmed cases among 286 390 antenatal mothers)



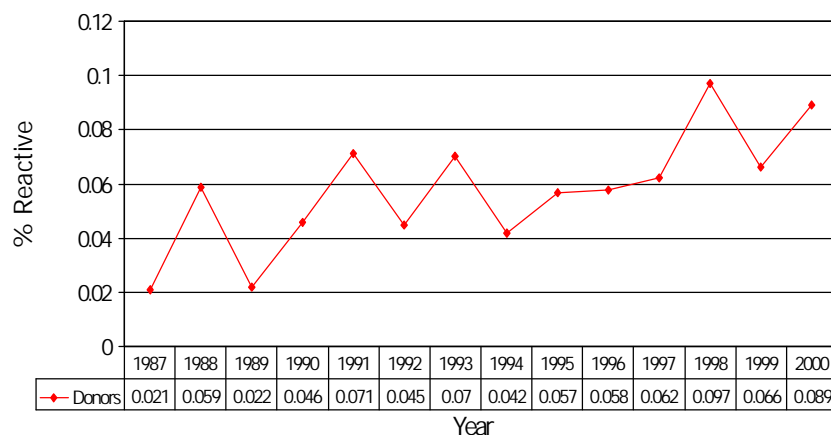
**Figure 7 - HIV Prevalence among ANC women, Malaysia 1998-2000**



\* Confirmed by EIA+ImmunoBlot

\*\* Prevalence rates in 1994, 1995, 1996, and 1997 were 0.14%, 0.28%, 0.21%, and 0.16% respectively using EIA test kit.

**Figure 8 - Percentages of blood donors reactive for HIV by year, Malaysia, 1987-2000**



\* The number of blood donors tested varied between 130 000 and 280 000 per year.

HIV variants of two HIV isolates from IDUs were classified into 2 subtypes, B and E (*International Journal of STD and AIDS*, 1995, Res. Inst. for Microbial Dis. Osaka University, Japan).

## **OTHER SEXUALLY TRANSMITTED INFECTIONS**

**Data sources:**

**1. Case reporting from STD clinics (see Table 2)**



**Table 2. Reported specific STDs by year in Malaysia  
1990 - 2000**

Year	1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000 *	
	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R
Gonorrhoea	4277	23.53	4008	22.05	3937	21.14	3614	18.62	2977	15.21	2157	10.62	1772	8.37	1393	6.43	1307	5.89	2232	9.83	1305	5.61
Syphilis	1855	10.33	2027	11.15	2093	11.24	2256	11.63	1804	9.22	1941	9.56	1562	7.38	1317	6.08	2460	11.09	2150	9.47	1705 (1)	7.33
Chancroid	92	0.51	114	0.63	58	0.31	24	0.12	23	0.12	5	0.02	6	0.03	4	0.02	18	0.08	9	0.04	7	0.03

C: No of cases

R: Rate % (cases/population)

\* Preliminary data

The cases of sexually transmitted infections (STI) monitored by the routine surveillance system are confirmed by laboratory tests (syphilis, gonorrhoea, chancroid and ophthalmia neonatorum). Syphilis screening has been carried out among blood donors and pregnant women in public clinics since 1985. Positive VDRL tests are confirmed by TPHA only for pregnant women.

Diagnosis of gonorrhoea is performed by urine examination. Blood samples are taken for diagnosis of chanroid. Diagnosis of ophthalmia neonatorum is made with an eye swab.

## 2. Prevalence surveys

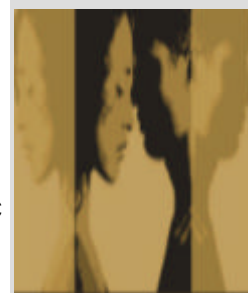
An STI prevalence survey was recently conducted among sex workers and antenatal clinic attendees (see Tables 3 and 4).

**Table 3: Prevalence rate of STIs among 208 (72 females and 136 females) sex workers, Kuala Lumpur, 2000**

STIs	Prevalence rate %	Testing techniques
<i>Trichomonas vaginalis</i>	0.9	PCR
<i>Neisseria gonorrhoeae</i>	2.4	PCR
<i>Chlamydia trachomatis</i>	6.3	PCR
Treponemal antibody seroactivity (syphilis)	30.8	RPR+TPHA
* Females (n=72)	*16.7	
* Males (n=136)	*38.2	
HIV	11.5	ELISA+ PA + LIA
* Females (n=72)	* 6.9	
* Males (n=136)	* 13.9	







**Table 4: Prevalence rate of specific STIs among 1070 antenatal clinic attendees, Kuala Lumpur, 1999**

STIs	Prevalence rate %	Testing techniques
<i>Trichomonas vaginalis</i>	0.47	PCR
<i>Neisseria gonorrhoeae</i>	0.2	PCR
<i>Chlamydia trachomatis</i>	1.6	PCR
Treponemal antibody seroactivity (syphilis)	0.3	RPR+TPHA
HIV	0.2	ELISA+ PA + LIA

A survey conducted by Johns Hopkin University, United States of America, found a prevalence of *Chlamydia trachomatis* of 10.3% for men (n=300) and 12.3% for women (n=300) using ligase chain reaction assay for urine specimens (*Sexually Transmitted Diseases*, 1996).

A survey in 1990 among high risk groups (*Genitourinary Medicine*, 1990) found a prevalence of 26.5% for Chlamydial infection, 14.25 % for Gonorrhoeal infection and 13.6 % for syphilis (testing techniques not specified) among 370 sex workers.

## **BEHAVIOURAL DATA**

### **Sexual behaviour:**

A study among dermatology and genitourinary clinic attendees in Johor Bahru in 1997, showed that the mean age of first sexual intercourse was 22.8 years for men and 22.3 years for women, and that 20% of men had visited sex workers (58.7% using a condom).

In a study among drug users, 55% were found to have sex with girlfriends, 31.3% with sex workers, and 4.6% with male partners. Among the HIV-positive cases who shared needles, 40% also had sex with sex workers.

There are limited data on sex work.

### **Drug use:**

A survey among the inmates in drug rehabilitation centres in 2000 found that 64.6 % of respondents were IDU, and 65.6% of those shared needles.

In a study among HIV-positive IDU, all of them reported sharing needles (*Medical Journal of Malaysia*, 1993).

### **ESTIMATION OF CURRENT HIV INFECTIONS IN 2000:**

#### **1. Data used for the estimation:**

##### **Demographic data:**

Population of Malaysia in 2000 (Monthly Statistical Bulletin, Malaysia, February 2000)	23 263 600
Population of 15-49 year-olds (Monthly Statistical Bulletin, Malaysia, February 2000)	12 622 600
Male/Female ratio (Monthly Statistical Bulletin, Malaysia, February 2000)	1.049:1
Estimated number of IDU (estimated by the National Anti-Narcotic Agency in 1999)	<b>130 000</b> -Drug users estimated: 200 000 (cumulative numbers minus deaths) -65% inject drugs, based on a study in rehabilitation centres (1998)
Estimated number of STI patients (estimated by the National HIV/AIDS Unit, Ministry of Health)	<b>82 800 *</b> -Based on 2 major STIs: gonorrhoea and syphilis -20% cases were reported to the Ministry of Health
Estimated number of sex workers (personal communications, Welfare Department and Anti-Vice Unit , Ministry of Home Affairs in 1999-2000)	<b>50 000</b>

##### **\* Calculations:**

- Gonorrhoea cases reported from states in 2000: 1315  
With 20% clinic attendees reported to the Ministry of Health, and 10% of patients (with symptoms and signs) attending clinics, the estimated number of patients with gonorrhoea is:  $1315 \times 5 \times 10 = 65\ 750$
- Syphilis cases reported from states in 2000: 8525  
With 20% clinic attendees reported to the Ministry of Health, and 10% of patients (with symptoms and signs) attending clinics, the estimated number of patients with syphilis is:  $1705 \times 5 \times 2 = 17\ 050$
- Assuming that other unknown STI data are not major problems, and the number of concurrent gonorrhoea and syphilis infections is minimal, the total estimated STIs will be:  $65\ 750 + 17\ 050 = 82\ 800$



HIV Prevalence rates (%) used:



Population tested	Low	Intermediate	High
<b>Injecting drug users (IDU)</b>	<b>21%</b> Lowest national rate in recent three years: 1354 positive in total 9811 drug users (6377 IDU; if we assume that 65 % DU inject drugs) in 1998.	<b>25%</b> 1122 positive among total 6838 drug users( 4444 IDU) in 2000	<b>44%</b> In sites having highest reported rate, 65 positive, in 225 DU (146 IDU) in 2000.
<b>Sex workers</b>	<b>1.5%</b> Lowest reported rate in national sentinel surveillance, 1996	<b>6.3%</b> Mean rate in national sentinel surveillance, 1996	<b>11.5%</b> Survey in Kuala Lumpur in 2000
<b>STI patients</b>	<b>1%</b> Lowest reported rate, sentinel surveillance, 1996	<b>3.6%</b> Mean of two survey results: -6.03% (national survey, 1998) - 0.6% (national survey in government clinics, 2000)	<b>14.4%</b> Highest reported rate, sentinel surveillance, 1996
<b>Antenatal women</b>	<b>0.01 %</b> Lowest rate found among states in 1999- 2000	<b>0.03%</b> National prevalence rate in 2000	<b>0.08 %</b> Highest rate found among states in 2000
<b>Blood donors</b>	<b>0.01%*</b>	<b>0.02%</b> Prevalence rate in 2000	<b>0.08%*</b>

\* No data available on range of prevalence rates (only % reactive), lowest and highest rates among antenatal women were applied.

## 2. Methodology:

Breaking the population into subgroups of known size, and HIV prevalence estimates were applied to each subgroup.

HIV Prevalence of each sub-group= HIV prevalence rate per subgroup x estimated population of given subgroup.

The total estimated number of current HIV infections is the sum of all estimated HIV infections (prevalence) of each subgroup.

## 3. Results:

### Estimates of current HIV infections in Malaysia in 2000

Sub-group	Low scenario	Intermediate scenario	High scenario
IDU	27 300 (130 000 x 0.21)	32 500 (130 000 x 0.25)	57 200 (130 000 x 0.44)
Sex workers	750 (50 000 x 0.015)	3200 (50 000 x 0.063)	5500 (50 000 x 0.11)
STI patients:	828 (82 800 x 0.01)	3000 (83 000 x 0.036)	11 923 (82 800 x 0.144)
15-49 year-olds * (excluding the above sub-groups)	629 (6 291 747 males x 0.0001)  600 (5 997 853 females x 0.0001)	1260 (6 291 747 males x 0.0002)  1800 (5 997 853 females x 0,0003)	1258 (6 291 747 males x 0.0008)  4798 (5 997 853 females x 0.0008)
	30 000	41 800	

\* Total: 12 289 600 (male to female ratio: 1.05:1)



#### 4. Assumptions:

- The prevalence rate used for male 15-49 year-olds (adults) is similar to the HIV prevalence rate among blood donors, and rates of 15-49 year-old females is similar to HIV infection rates among antenatal women. However, because most persons screened are in urban areas, the estimate results in adults should be considered with caution. They are not adjusted according to the urban to rural ratio of HIV infection rate.
- HIV prevalence among children is minimal as the epidemic occurs mainly among drug users and heterosexuals at high risk.

#### STRENGTHS AND LIMITATIONS OF THE CURRENT SURVEILLANCE SYSTEM

The routine HIV/AIDS case reporting system of has been well developed. HIV sentinel surveillance was abandoned in 1997 as sentinel groups were included in the screening system. Screening is an institutionalized programme which covers all potential settings for HIV testing (government and private) for vulnerable as well as for low-risk groups. The system serves as a helpful tool for blood safety, diagnosis of HIV infection and, partly, for surveillance activities. It is a basis on which to offer services such as counselling, treatment , etc. to these populations. All HIV cases are confirmed according to testing strategy III of WHO. All confirmed cases are included in the HIV reporting system from state level to the Ministry of Health.

However, duplication of case reporting needs to be considered, as many persons can be screened more than once and the notification system cannot easily identify such people. The Ministry of Health believes that up to 10-20% of reported HIV infections may represent duplicate reporting. Case reporting of STIs is incomplete (reporting coverage rate ranged 7% provided from a study before 1999 and 20% as estimated by the National AIDS/STD Unit recently).



In terms of surveillance, particularly to provide annual prevalence data in a consistent way in order to assess the trends of the HIV epidemic, the data collection has met the following issues:

- In most cases the percentage of reactive samples among the tested samples are reported: that figure could be better used to evaluate the workload of laboratories involved in HIV testing. Sometimes there is double counting of two reactive samples before confirmation for one person. Therefore, the data should be used with caution to evaluate trends.
- The HIV prevalence rate based on the number of confirmed cases as the numerator, and the number of persons tested for each target group is not analysed in the surveillance results. That requires a standard form of data collection from testing sites to states, and from states to the Ministry of Health
- Sex workers and STI patients are not considered as separate groups, but are combined, together with other sexual groups, into a larger group called sexually related samples, making it difficult to determine the HIV prevalence rate and monitor HIV trends in each of the two groups.
- There are very few sex workers in fixed screening settings, making it difficult to reach a significant number of sex workers and to enroll them in screening in a consistent way.
- Prevalence surveys of STI are undertaken in different areas with different sampling methodologies and testing techniques, and are not designed systematically to monitor trends for specific STI in specific populations.
- A similar experience can be observed for behavioral surveillance as for STI prevalence surveys: a few existing behavioral results can help identify some extent of the behavioral situation to some extent, but cannot help much in evaluating and planning prevention programmes.



## CONCLUSIONS AND RECOMMENDATIONS

Malaysia is a country with a concentrated HIV epidemic, based on the current WHO/UNAIDS classification: the HIV prevalence has been less than 1% among the general population, and consistently higher than 5% consistently among IDU in the past 10 years.

The HIV epidemic among IDU seems to be still progressing.

In estimating the number of current HIV infections, IDU account for the biggest part.

Recent studies have shown that one-third of IDUs have had sex with sex workers; 20% of the general population of males have visited sex workers, and nearly half of them do not use condom in commercial sex. This could lead to the spread of HIV from the IDU population to groups at high risk of sexual transmission, and then to the general population. An appropriate strategy is required to change their high-risk sexual behaviours.

In order to better estimate the current situation and evaluate the trends of the epidemic, the workshop on improvements of surveillance activities recommended the following:

(1) In preparation for the next workshop (at least two years from now), small expert working groups should be developed to gather, review, evaluate, and then to use the available data to estimate HIV prevalence and the specific size of the following populations and subpopulations:

- (a) Persons with low or no HIV-risk behaviors (i.e., the general population);
- (b) IDUs; and
- (c) Sex workers (male and female), and their clients. As a surrogate for the male clients of SWs, data need to be collected from male STI patients.



These working subgroups should then present their data, assumptions, methods, and resultant estimates and projections to the total consensus workshop for discussion and ultimate approval.

(2) The AIDS Programme needs to develop definitions for each of the subpopulations for which an estimate and projection will be made. The small expert groups should try to ensure that the appropriate subpopulations are correctly used in both the numerator and denominator i.e. IDUs not drug users.

(3) The laboratories and blood banks should be asked the number of persons tested and the number found to be positive (confirmed following WHO testing strategy) to avoid confusion over the number of positive HIV tests for a given number of blood samples.

(4) HIV prevalence data reported from the states also need to provide the number of confirmed cases as the numerator and the number of persons tested as the denominator.

(5) HIV sentinel sites need to be developed in addition to screening activities, to monitor sexual transmission. Sentinel surveillance should focus on hard-to-reach groups, such as sex workers, in order to obtain more representative data in a more consistent way. HIV prevalence among female sex workers in Asian countries where extensive heterosexual transmission is occurring is generally several times higher than in male STI patients. The estimated HIV prevalence rates of sex workers and STI patients in Malaysia have probably been overestimated, especially the prevalence rate among STI patients, due to the limited representativeness of existing surveys.

(6) The highest priority for the AIDS Programme in Malaysia is to estimate the size of the subpopulations with the highest HIV-risk behavior. This is because the current largest source of error in developing reliable HIV prevalence estimates is the estimation of the size of these risk-behavior populations, particularly the IDU population.





## ANNEX

## List of participants

	Name	Title, Institution
1	Dr Lee Cheow Pheng	Director of Disease Control Division, MOH
2	Dato' Dr Tee Ah Sian	State Director of Health, Perak
3	Dr Shafie Ooyub	State Director of Health, Kedah
4	Dr C P Senan	State Director of Health, Johor
5	Dato' Dr Faisal Hj Ibrahim	Deputy Director of Disease Control. Division, (AIDS, STI) MOH
6	Dr Marzukhi Md Isa	State Director of Health, Terengganu
7	Dr Hj Jalal b Halil Khalil	Deputy Director, Pahang
8	Dr Sulaiman Che Rus	Director, Institut Kesihatan Umum
9	Dr Andrew Kiyu	Deputy Director, Sarawak
10	Dr Nirmal Singh	Deputy Director, Sabah
11	Dr Zainol Ariffin Pawanchee	Director of Health Department, Kuala Lumpur Board Municipality
12	Dr Ahmad Nordin b Mohd Jais	State Director of Health, Perlis
13	Dr Azmi b Shapie	Deputy Director, Pulau Pinang
14	Dr Rosnah Ismail	Deputy Director, Melaka
15	Dr Mustaffa Bakri Adnan	Deputy Director, N Sembilan
16	Dr Christopher Lee	Medical Consultant, Hospital Kuala Lumpur
17	Dr Mangallam Sinniah	Institute of Medical Research (IMR), Kuala Lumpur
18	Dr Yasmin Abdul Malek	Microbiology Department, National University of Malaysia Hospital
19	Dr Yasmin Ayob	National Blood Centre, Kuala Lumpur
20	Dr Choon Siew Eng	Dermatologist, Hosp J Bharu
21	Prof Ngeow	Medical Microbiology, Uni Malaya
22	Prof Ng Kee Peng	Medical Microbiology, Uni Malaya
23	Dr Adeeba Kamaruzaman	Medical Consultant, Uni Malaya
24	Dr Abdul Rasid Kasri	Principal Assistant Director, MOH
25	Dr Rohani Ali	Principal Assistant Director, MOH
26	Dr Ahamad Jusoh	Senior Assistant Director, Bhg. Kawalan Penyakit, Ministry of Health, Malaysia
27	Dr Zainudin Abd Wahab	Senior Assistant Director, Bhg. Kawalan Penyakit, Ministry of Health, Malaysia
28	Dr Mahiran Mustafa	Pakar Perubatan, Hosp Kota Bharu
29	Dr Mohd Nasir b Abdul Aziz	Assistant Director, Bhg. Kawalan Penyakit, Ministry of Health, Malaysia
30	Dr Fauziah Mohd Nor	Assistant Director, Bhg. Kawalan Penyakit, Ministry of Health, Malaysia
31	Dr Anita Suleiman	Assistant Director, AIDS Selangor
32	Dr Rosli Ismail	Assistant Director, AIDS Johor
33	Dr Shaari Ngadiman	Assistant Director, AIDS Pahang
34	Dr Zaini Hussein	Assistant Director, AIDS Kelantan
37	Datin Paduka Marina Mahathir	Malaysian AIDS Council
38	Nik Fahmee Nik Hussin	Malaysia AIDS Council
39	Anariah Ali	Pembantu Tadbir
35	Dr James Chin	Consultant WPRO
36	Dr Nguyen Thi Thanh Thuy	Consultant WPRO