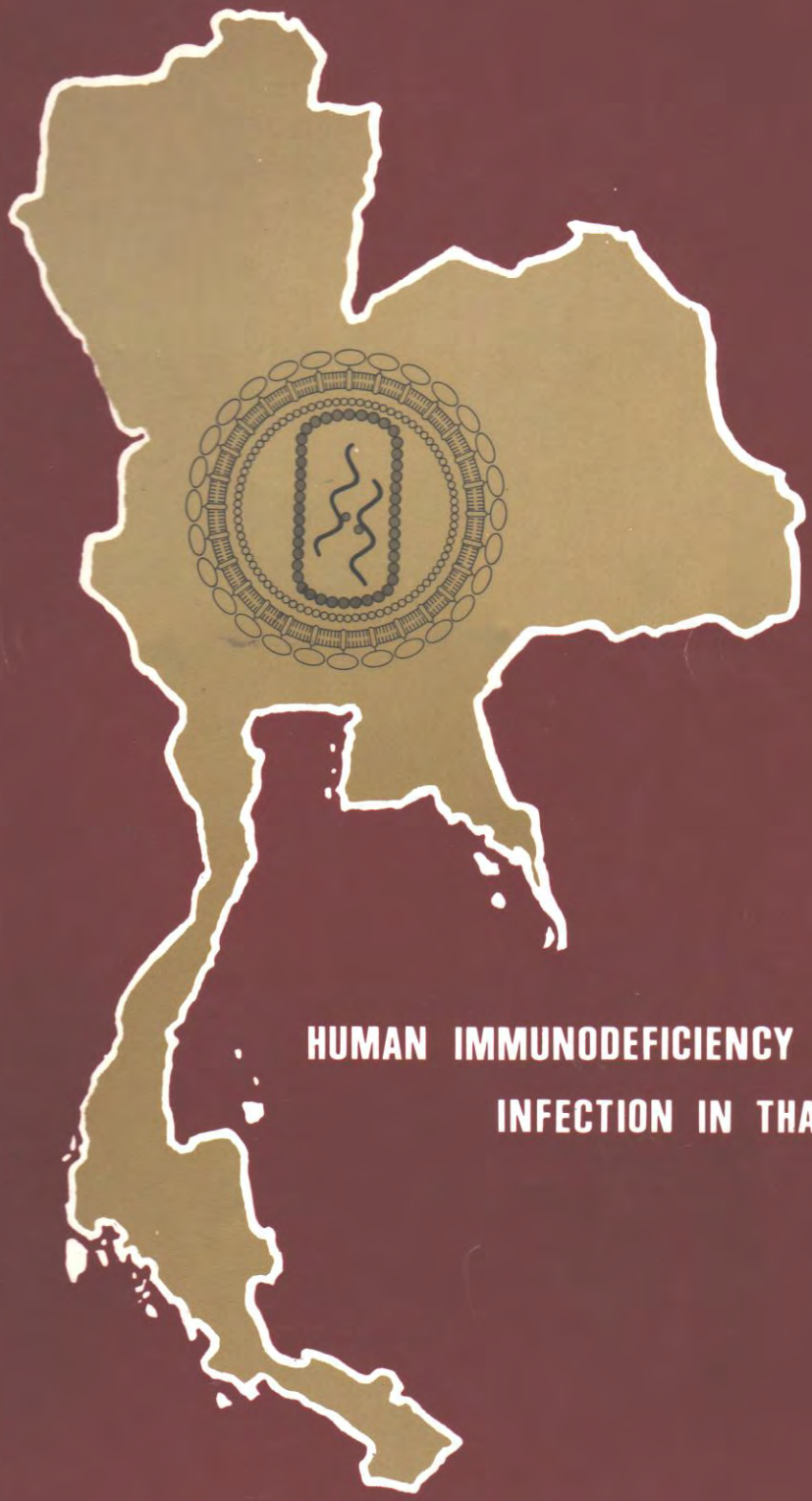

HUMAN IMMUNODEFICIENCY VIRUS INFECTION IN THAILAND

HUMAN IMMUNODEFICIENCY VIRUS INFECTION IN THAILAND

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CONTENTS

Thailand : Land of Smile and Recreation Attraction

Thailand is a tropical country located in the heart of South-East Asia between 5° 37′ N and 20° 27′ N latitude and between 97° 22′E and 105°37′E longitude with an area of approximately 540 000 square kilometers with a population of approximately 55 million. Neighbouring countries are Burma to the West and North-West, Laos to the East, Kampuchea to the South-East and Malaysia to the South. There are four geographically distinct regions; the hilly and mountainous Northern Region, the high plateau North-East Region, the lowland Central Region and the peninsular Southern Region. The Central Region is the economic centre of the country in which 70 per cent of the urban population resides. Bangkok, the capital with a population of almost 6 million, is also the main sea-and air-port as well as the biggest trade and tourist centre in the country. Ships and airplanes have connected Bangkok with not only large cities and tourist spots of Thailand, but also with the outside world for a long period of time. The well-known resorts are Pattaya City and the River Kwai in the Central, Chiang Mai and the "Golden Triangle" in the North, Khon Kaen in the North-East, and Hat Yai, Koh Samui and Phuket in the South. Tourist industry is one of the important sources of income of the country. In 1987, the Government of Thailand had the policy of tourist promotion and hence "Visit Thailand Year" was announced and advertised around the world (Fig. 1).

The weather is warm almost all year round with an average temperature between 22 C and 32 C, except in the North, where fluctuation is greater and generally several degrees cooler due to the higher elevation. A tropical savanah climate prevails from the Gulf of Thailand to the North with a tropical monsoon and maritime climate in the South. There are three seasons- a rainy season which begins in May and lasts until the second half of October; a cool dry season from November through January, and hot dry season extending from February through April. A monsoon climate, however, prevails almost half of the year throughout the country and during the rainy season it rains almost every day. There is usually a gradual transition between seasons.

The relative humidity from August to October in the early morning is close to 100 per cent, and at ground level, averages 80 per cent for the whole day. In March and April the relative humidity may be as low as 18 per cent in the afternoon.

Communications are well developed. There are networks of highways and roads, railway and air services to all centers of the population. Only a small portion of the population resides in small villages in the far-most areas which requires a helicopter or several hours of travel by foot to be reached. Telecommunications namely telephone, radio and television cover the entire country and all districts in rural provinces have radio transmitters/receivers. The most efficient media for education are radio and television programmes.

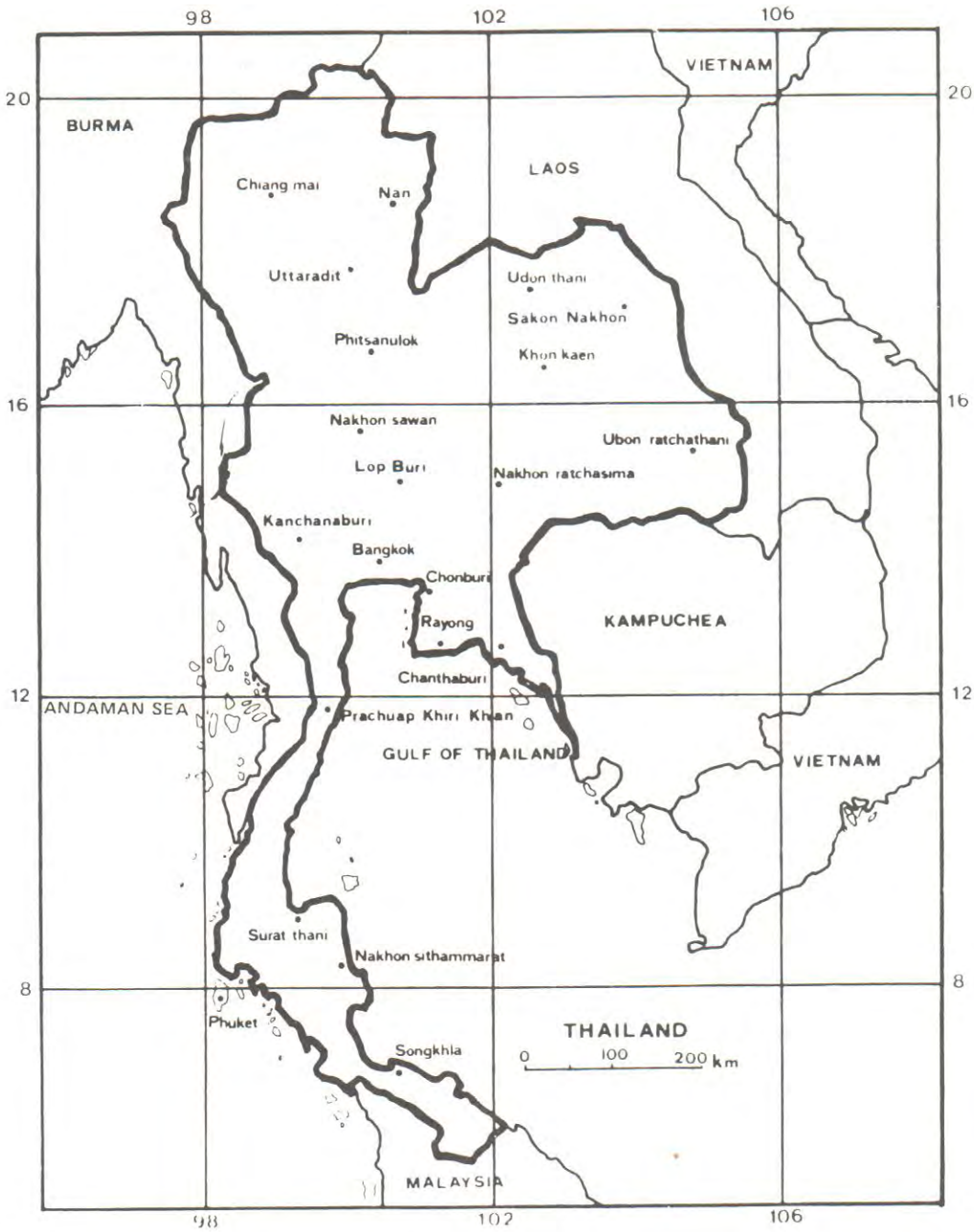

Fig 1. Map of Thailand.

The top 5 cities which have been more frequently visited by the tourists are Bangkok, Pattaya, Chiang Mai, Phuket and Hat Yai[1]. Table 1 shows the increasing tourist industry of Thailand.

TABLE 1.

NUMBER OF VISITORS VISITING THAILAND AND ESTIMATED EXPENDITURE BETWEEN 1982 AND 1987[1].

Year	Number of visitor	Estimated Expenditure in million US $	Increase from the previous year in million US $
1982	2 218 429	995.16	–
1983	2 191 003	1 002,00	6.48
1984	2 346 709	1 092.68	9.06
1985	2 438 270	1 270.72	178.00
1986	2 818 092	1 492.84	222.12
1987	2 482 958	2 000.96	508,12

*One US dollar is approx. equivalent to Bht 25.–

Health Care Delivery System

Infrastructures of health care delivery system in Thailand from the primary health care to the tertiary medical care are well developed. Table 2 shows basic facts and figures on Thailand with a special focus on the health profiles.

TABLE 2.

BASIC HEALTH INDICATORS OF THAILAND.

Area : 514 000 sq km Density of population per sq km (1986) : 102

Item	1975	Latest Data	Year
Population			
Population (in thousands)	4 1 861	52 654	1986
Urban population (%)	14.4	25.4	1986
Population under 15 years (%)	43.7	37.5	1985
Vital Statistics			
Expectation of life at birth M :	57.6	61.75	1985
F :	63.6	67.50	1985
Crude birth rate	28.4	18.4	1985
Crude death rate	5.0	4.4	1985
Annual population growth rate (%)	2.4	1.4	1985
Infant mortality rate	21.1	11.3	1984
Maternal mortality rate	1.7	1.7	1985
Health Resources			
Facilities			
Number of hospital beds	52 652	93 176	1986
Population per hospital bed	796	565	1986
Hospital beds per 10 000 pop.	12.6	17.7	1986
Health centres			
(a) rural	...	7 543	1986
(b) urban	...	56	1986
Manpower			
Number of doctors	5 005	11 050	1986
Population per doctor	8 366	4 765	1986
Doctors per 10 000 population	1.2	2.1	1986
Number of nurses/midwives :			
(a) Professional	18 993	45 363	1984
(b) Auxiliary (including midwives)	...	22 185	1984
Socioeconomic Indicators			
Government health expenditure as percentage of total expenditure	3.2	4.38	1986
Per capita government health expenditure (Baht)	109.1	179	1986
Literacy rate (%) M :	84.0	94	1985
(Age 10 years and over) F :	88.0		

*Registered rates. Rates obtained by sample survey was 56 per 1 000 live births in 1974/75.

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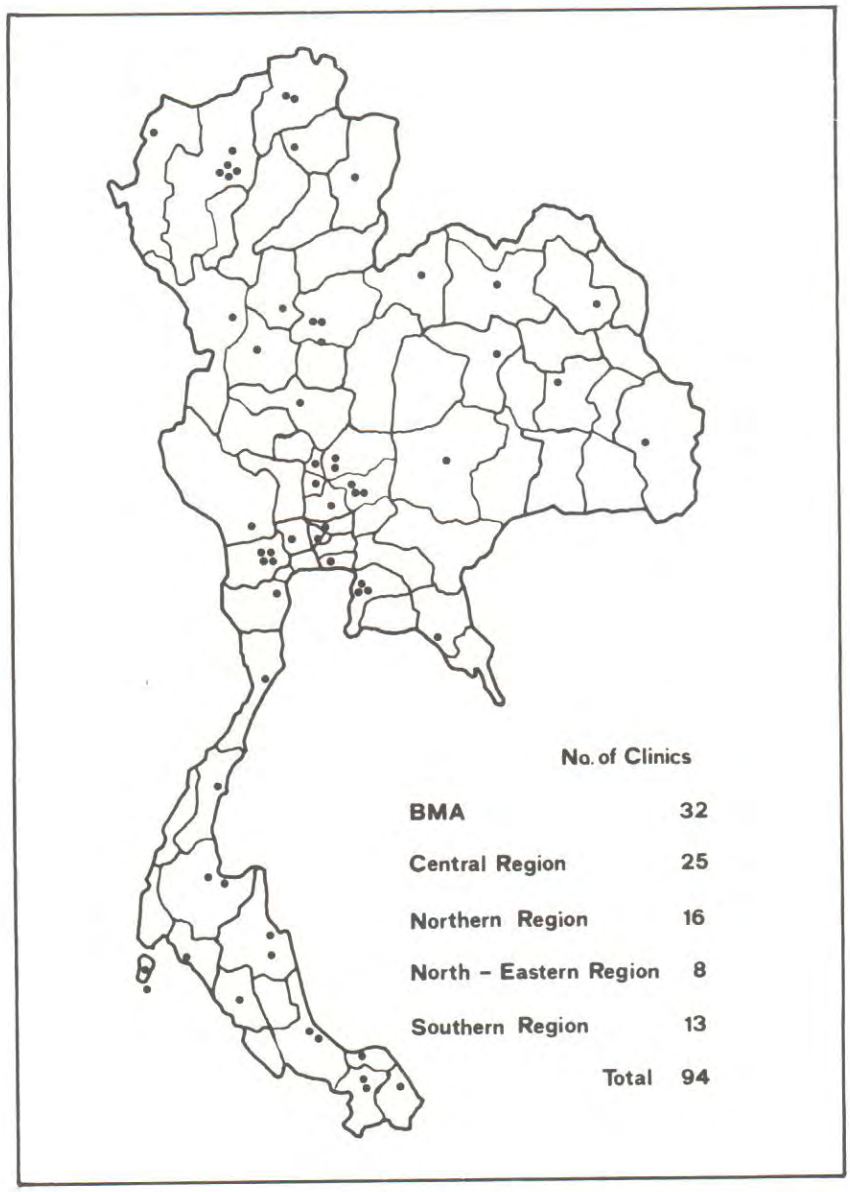

Fig 2. Distribution of Drug Dependence Service Clinics, Thailand 1985.

Background of Drug Problem in Thailand [2,3]

It is not definitely known when opium actually spread into Thailand. So far, from the historical events it appears that in the Reign of King U-Thong of Ayudhya Period, a criminal code was enacted in the year 1360 authorizing the confiscation of opium addicts and sellers and their imprisonment, etc.

During the Ratanakosin Period, the above penalties were made more severe, but the suppression was still not successful and on the other hand opium addiction become more widely spread, especially among the Chinese community. In 1851, the era of opium franchise started in Thailand. King Rama IV passed a bill allowing opium to be traded under a strict official act and endorsed opium smoking among the ethnic Chinese in Thailand. The extensive law enforcement control did not decrease the illicit opium supply or opiate dependence and the drain of local currency through the massive illegal opium trade to foreign countries.

On December 9th, 1958, the Thai Government, under the premiership of Field Marshal Sarit Thanarat, proclaimed the total abolition of opium smoking. At that time, the total number of registered opium smokers for the whole country was approximately 70 965. After the proclaimation, new kinds of drugs, more potent than opium, were introduced into the country. From police records, heroin entered Thailand from Hong Kong in 1959 and first spread among former opium smokers, because it is easier to consume, just by inhaling the odourless vapour from its burning in a tin-foil. That event heralded the beginning of the first heroin dependence epidemic in Thailand.

This early starting period of 3-4 years was sufficient to attract attention not only from the government but also the public. Because of the rapid growing popularity of heroin consumption, foreign chemists then came to Thailand to produce it locally. Some of them went to Burma and the "Golden Triangle" area to set up mobile plants to manufacture heroin on a large commercial scale and not only to sell it locally but also to export it to the world market. Thailand has subsequently suffered tremendously from a heroin dependence problem. Heroin, produced in the early stage, was low in purity and known as heroin number 3, and later on the purity was subsequently increased to 95 per cent and known as number 4.

The second heroin dependence epidemic started around 1967-1975 and was so extensive and long extended. After that the drug dependence was declared as the priority problem of the country. In 1976, the Narcotics Control Board (NCB) was chaired by the Prime Minister acting as the national co-ordinating committee responsible for the intervention. The Office of the Narcotic Control Board (ONCB) served as the secretariate of NCB. For the first time, statistics and information had a central agency responsible for systematic data compilation and utilization. The number of drug dependencies especially heroin users for the whole country has been estimated with a wide range of discrepancy between 100 000 and 500 000. Information system is, therefore, essentially needed. In September 1976, the Central Registry Subdivision, Treatment Division (CRS/TD) of the ONCB/launched a pilot information system of drug dependence treatment population in collaboration with the Department of Medical Research Center, Insitute of Health Research (DMRC/IHR), Chulalongkorn University. The system is a treatment event reporting system. It is noteworthy to point out that, drug dependence treatment service can operate only under license from the Ministry of Public Health through the Department of Medical Services (DMS). They were therefore required to adopt a standard intake form for the admission of the client to the service and copies were sent to the CRS/TD and DMS. They were allowed to collect more additional information for their own use. The actual data compilation of the information system began in January 1979 and still continues to operate until the present time. Table 3, and Figure 2 show the distribution of type of drug dependence service units reported to the central information system from 1983

to 1985 which is classified by geographical areas. Heroin dependences treatment cases classified by urbanicity of residence is depicted in Table 4, and Figure 3. Tables 5 and 6 shows informations on the re-enter and prevention figures including age distribution of clients collected by the Bangkok Metropolitan Administration[4,5].

TABLE 3.

FREQUENCY DISTRIBUTION OF TYPE OF DRUG DEPENDENCE SERVICE UNITS REPORTED TO THE CENTRAL INFORMATION SYSTEM IN 1983–1985, CLASSIFIED BY GEOGRAPHICAL LOCATION.

Region	Treatment center				Total Number
	Temple Number	Clinic Number	Private hospital Number	Government hospital Number	
Bangkok Region					
1983	–	4	4	26	34
1984	–	4	5	24	33
1985	–	3	5	24	32
Central Region					
1983	2	–	–	17	19
1984	2	–	–	19	21
1985	2	–	–	23	25
Northern Region					
1983	–	1	1	11	13
1984	–	2	1	12	15
1985	–	2	1	13	16
Northeastern Region					
1983	1	–	–	5	6
1984	1	–	–	9	10
1985	1	–	–	7	8
Southern Region					
1983	–	–	–	8	8
1984	–	–	–	11	11
1985	–	–	–	11	11

TABLE 4.

HEROIN DEPENDENCE TREATMENT CASES CLASSIFIED BY URBANICITY OF RESIDENCES.

		1981 Number	1982 Number	1983 Number	1984 Number	1985 Number
Bangkok						
	New case*	1 806	2 044	2 608	3 057	3 425
	Old case**	13 720	17 720	20 281	20 754	22 112
	Total	15 526	19 203	22 889	23 811	25 537
Central Region						
Urban area :	New case	722	780	1 064	1 243	1 620
	Old case	1 786	2 298	3 035	3 875	4 905
	Total	2 508	3 078	4 099	5 118	6 525
Rural area :	New case	609	693	927	1 167	1 503
	Old case	1 133	1 386	1 681	2 401	2 711
	Total	1 742	2 079	2 608	3 568	4 214
Northern Region						
Urban area :	New case	261	294	477	615	538
	Old case	401	581	706	709	739
	Total	662	875	1 183	1 324	1 277
Rural area :	New case	209	302	393	761	580
	Old case	292	412	453	490	562
	Total	501	714	846	1 251	1 142
Northeastern Region						
Urban area :	New case	56	52	107	234	160
	Old case	53	59	113	197	188
	Total	109	111	220	431	348
Rural area :	New case	59	50	86	141	161
	Old case	33	38	76	96	131
	Total	92	88	162	237	293
Southern Region						
Urban area :	New case	161	193	446	504	538
	Old case	181	324	423	731	1 373
	Total	342	517	869	1 235	1 911
Rural area :	New case	199	190	360	422	569
	Old case	192	259	347	429	1 138
	Total	391	449	707	851	1 707

*Case that report no previous treatment

**Case with history of previous treatment

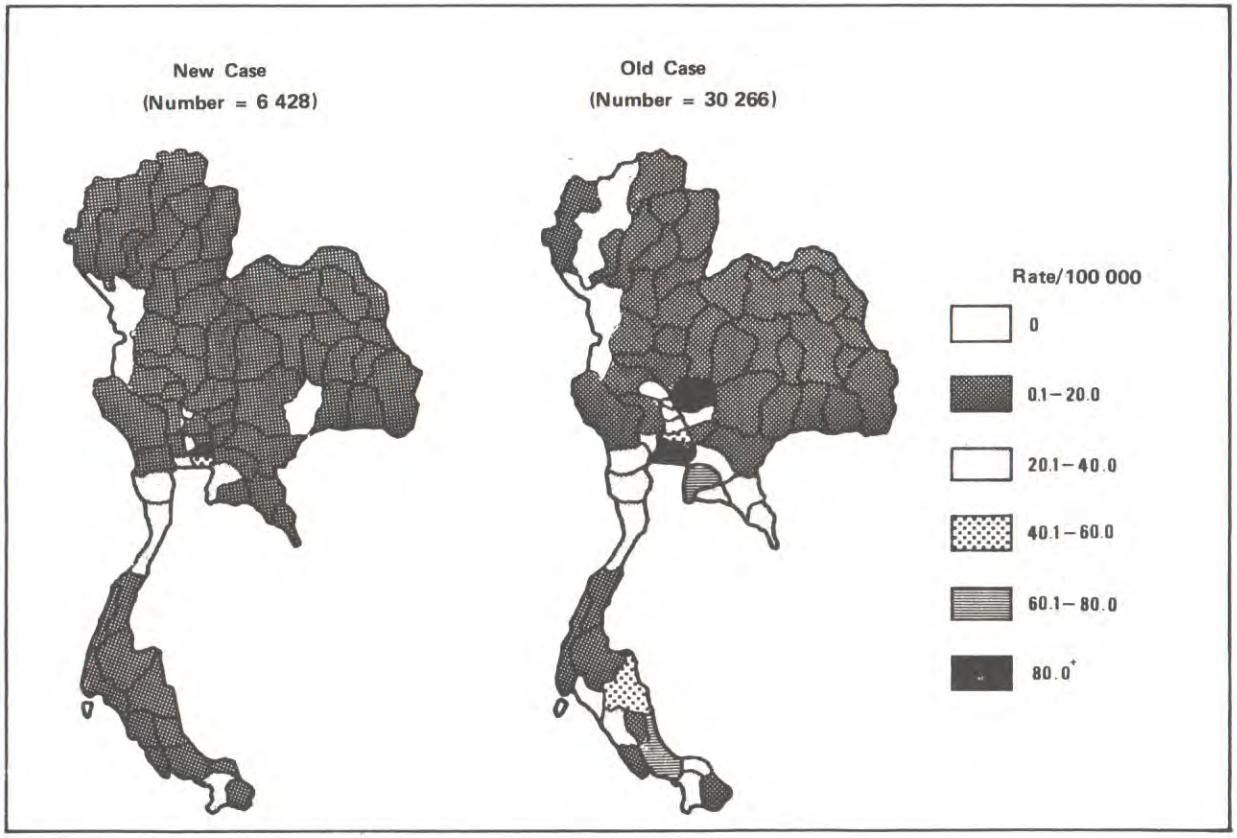

Fig 3. Distribution of Prevalence Rate (Per 100 000) of Intravenous Drug Users by Province, Thailand 1985.

TABLE 5.

DRUG DEPENDENCE RE–ENTER AND PREVENTION DATA, FISCAL YEAR 1983–1987, BANGKOK METROPOLITAN ADMINISTRATION[4].

	1983	1984	1985	1986	1987
No. of Clinic	17	17	17	17	17
No. of Prevention Unit	21	31	31	31	31
No. New admission	4 645	3 982	3 265	2 948	2 905
Total Admission (cases)	42 206	42 090	42 498	45 836	43 996
Age < 15	0.2	0.2	0.3	0.7	0.51
(%) 15 – 19	6.7	6.7	6.5	6.8	6.27
20— 24	29.6	26.1	26.6	24.8	25.05
25 – 29	36.0	36.7	35.5	34.6	31.22
> 29	27.5	30.3	31.1	33.1	36.95
Sex					
Male : Female (%)	93.5 : 6.5	94.2 : 5.8	92.9 : 7.1	93.4 : 6.6	92.95 : 7.0
Employment Status (%)					
Permanent Job	4.1	45.5	46.8	45.8	49.25
Temporary Job	13.2	16.4	15.9	14.8	13.40
Unemployed	31.1	33.4	33.4	35.4	33.97
Students	4.9	4.7	3.9	4.0	3.35
Others	6.1	–	–	–	–
Type of Drug use (%)					
Heroin	96.7	97.5	96.9	96.5	96.55
Opium	1.0	0.6	0.9	0.6	0.58
Canabis	0.7	0.7	0.8	0.4	0.58
Others	1.6	1.2	1.4	2.5	2.29
Prevention Activities	413 343	506 150	516 303	516 921	471 450

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TABLE 6.

NUMBER AND PERCENTAGE OF DRUG DEPENDENTS APPLYING FOR TREATMENT CLASSIFIED BY AGE DURING 1984–1986 (FISCAL YEAR)[5].

Age	Number and Percentage of Drug Dependents					
	1984		1985		1986	
	Number	Percentage	Number	Percentage	Number	Percentage
Under 11	3	0.01	–	–	6	0.01
11 – 15	182	0.39	154	0.29	190	0.35
16 – 20	3 344	7.19	3 471	6.62	3 451	6.32
21 – 25	12 553	27.06	12 821	24.47	12 097	22.15
26 – 30	15 442	33.21	17 399	33.20	18 086	33.11
31 – 35	7 111	15.29	3 061	17.29	10 583	19.37
36 – 40	2 511	5.40	3 196	6.10	3 892	7.12
41 – 45	1 981	3.83	1 918	3.66	1 940	3.55
46 – 50	1 450	3.12	1 718	3.28	1 600	2.93
51 – 55	982	2.11	1 208	2.31	1 114	2.04
56 – 60	533	1.15	740	1.42	832	1.52
Over 60	606	1.30	613	1.36	835	1.53
					Not Known	
					257	

N.B. Fiscal Year : October to September.

Type of drug Dependence

The drug problem in Thailand has many different forms and with different types of drug dependency in each group of people. For example, a considerable number of Thai hilltribe people in some parts of the Northern Region, who earn their living by growing opium poppies, smoke and addict to it, while the people in provincial plain are widely addicted to opium, kratom plant, marihuana, stimulants and pain-killers. Heroin is used by youths between 16 and 25 years old in urban areas especially in slums.

The statistics from treatment event intake revealed that between 1983 and 1985 heroin contributed about 60 per cent of the total new cases. Next was opium at about 20 per cent followed by ganja at about 5-7 per cent (Table 7). Morphine users were noted among the worker population of the tin-mines of Phuket, administered by injections. Complications leading to fatality were also observed. It was used in combination with other drugs too.

TABLE 7.

DISTRIBUTION OF PRINCIPAL DRUGS USED DURING THE LAST 30 DAYS BEFORE ADMISSION OF NEW CASES OF TOTAL TREATED POPULATION BETWEEN 1983 AND 1985[3].

Principal Drug Used during last 30 days	New cases of 1983 %	1984 %	1985 %
Heroin	62.5	63.9	62.6
Opium	20.8	21.6	23.4
Ganja	7.5	5.3	5.3
Inhalants	2.6	2.4	2.8
Others	6.6	6.9	5.8
Total Cases	10 369	12 777	14 571

In 1983-1985, Bangkok had the largest number of heroin users, 36.5-39.4%, followed closely by the Central Region at 28.9 to 33.5%. The North-eastern Region had the least share, only 2.9-4.5%. It should be noted that, Bangkok had about 10% of the total national population while the North-East has the largest population of about 35%. The route of administration by intravenous injection is an extremely important indicator on the severity of the drug problem and the high risk of HIV transmission through the practice of needle sharing. Heroin number 4 is the most popular among the heroin dependents and as mentioned earlier most of them use the drug intravenously (Table 8)[6].

TABLE 8.

MODE OF HEROIN ADMINISTRATION IN 1982 [6].

Category	Number	% Administration		
		Smoking	IM	IV
Bangkok				
New case	2 403	17.4	0.5	82.1
Old case	17 107	6.9	1.0	92.1
Central Region				
New case				
Urban	775	27.2	0.6	72.1
Rural	693	23.4	0.1	76.5
Old case				
Urban	2 292	11.2	1.1	87.7
Rural	1 382	10.6	0.4	82.9
Northern Region				
New case				
Urban	294	16.0	0.3	83.7
Rural	300	16.3	0.3	83.3
Old case				
Urban	579	9.3	0.7	90.0
Rural	411	10.5	0.5	89.1
Northeastern Region				
New case				
Urban	52	7.7	–	92.3
Rural	50	12.0	–	88
Old case				
Urban	59	3.4	–	96.6
Rural	38	5.3	–	94.7
Southern Region				
New case				
Urban	192	25	–	75
Rural	190	40	0.5	59.5
Old case				
Urban	323	11.1	1.9	87.0
Rural	258	13.6	1.2	85.3

Detoxification Outcome

The accumulated data from all outpatients in the methadone detoxification clinic of the DPTD/BMHD revealed that about 90 per cent of the cases who re-entered the treatment service could abstain from drug use for less than 15 days. Only about 3% reported an abstinence period of 12 months or over. The mean drug abstinence of each clinic between 1983-1985 ranged between 0.1 ± 0.6 to 1.9 ± 8.0 month.

Background of the Sexually Transmitted Diseases

Sexually transmitted diseases (STDs) are a nation-wide health problem in Thailand, particularly among groups with high risk sexual behaviours. Diseases in this group are categorized into venereal diseases and other minor STDs. The reported annual incidence for all venereal diseases (syphilis, gonorrhea, chancroid, lymphogranuloma venereum and non-gonococcal urethritis) in Thailand increased from 193 per 100 000 population in 1967 to over 700 cases per 100 000 in 1987. Table 9 shows the incidence of selected sexually transmitted diseases reported in Thailand in 1986 and 1987[7].

TABLE 9.

NUMBER OF CASES AND INCIDENCE OF SOME STDs IN THAILAND, 1986–1987.

Sexually Transmitted Diseases	1986		1987	
	No. of cases	Rate Per 100 000	No. of cases	Rate per 100 000
Syphilis	19 041	36.2	21 682	40.6
Gonorrhoea	236 544	450.2	232 859	436.1
Chancroid	46 719	88.9	45 486	85.2
Lymphogranuloma venereum	17 826	33.9	19 708	36.9
Nongonococcal urethritis	92 643	176.3	90 671	169.8
Genital herpes infection	14 405	27.4	13 247	24.8

Source : Venereal Disease Division, Department of Communicable Disease Control.

Remark : Primary syphilis accounts for 5% of all reported syphilis cases.

Some STDs have been identified as cofactors of HIV infection. Those which are prevalent in Thailand include syphilis, chancroid and herpes. The reported increase in the incidence of these STDs in Thailand could be considered as an indicator of the risk of HIV transmission through sexual contact.

The sexually transmitted disease control programme is well established in Thailand under the Veneral Disease (VD) Division of the Department of Communicable Disease Control (CDC). There are 8 VD clinics in Bangkok and 9 Regional VD Centres providing technical supervision to provincial VD clinics. Currently, CDC is promoting the Accellerated Communicable Disease Control Programme, which uses existing resources to integrate STDs control activities and AIDS prevention and control activities. Guidelines for prevention, control and treatment of STDs have been distributed to various health authorities.

HIV infection in Thailand and Action Response of the Authority

1. Legislative Action

The first case of full-blown AIDS was reported in Thailand in August 1984[8,9]. The patient was a 28, bisexual male and had just returned from the United States where he had spent 2 years. He was hospitalized there and then returned home where he received additional care. He died by the end of 1984. Due to this alarming event, serological investigations of the high risk group were begun that year.

The second reported case, in December 1984, was a homosexual foreigner who returned home after a short period of stay[10]. In 1985, 4 more cases were reported. Three are foreigners who had acquired infections abroad. The only Thai patient was a 27 year old bisexual male who had contracted the disease from a German who visited Thailand every 2 to 3 months. The patient's female partner was also infected and was classified with HIV as ARC.

According to the increasing importance of the AIDS problem, the Ministry of Public Health issued Ministerial Announcement number 2 on May 1st, 1985 under the Communicable Diseases Control Act (1980) to include AIDS in the list of notifiable disease[11]. The aim of this announcement was to assist in the case detection and to prevent further transmission of the disease. In August 1985, a National Advisory Committee on AIDS was first established and the committee members were revised in November 1987 and comprises of responsible health administrators, lawyers and technical experts. The responsibilities of this committee were to coordinate and cooperate among the institutions concerned in the prevention and control of AIDS, to give advice on the research intervention for the benefit of prevention and control of AIDS; and to appoint the ad hoc committee to study on any specific critical issue. Moreover, 3 additional subcommittees had been designated; namely - Subcommittee on Public Relations, Subcommittee on Technical Aspects and Subcommittee on Data Collection and Information. In October 1988, the National Advisory Committee was again revised and approved by the cabinet in order to include more government authorities and agencies especially, the non-health workers to work closer together.

No case of AIDS was reported in 1986. However, some HIV seropositive subjects were identified by serological studies[13-15]. All belonged to a group subjected for screening in order to identify the high risk factors.

On August 26, 1986 the Ministry of Interior issued Ministerial Announcement number 11 to include AIDS into the Immigration Act (1979)[12]. The aim of this announcement was to prevent the HIV infected aliens (excluding aliens who have permanent residency and aliens born in Thailand) from entering into the Kingdom and to deport infected aliens from the country.

In 1987 between May and August, 6 more AIDS cases reported in Thailand. They were all homosexual Thai males and in general, the infections were mostly acquired abroad. Lastly in 1988, one heterosexual female AIDS who received blood transfusion in a Middle East country and one female pediatric AIDS patients from asymptomatic anti-HIV positive mother have

been reported. Up to December 31, 1988, there were 3138 reported HIV infected persons in Thailand. Of these, ten were full blown AIDS, 38 were AIDS Related Complex and 3090 were asymptomatic HIV infected persons (Table 10, Fig. 4)[13].

TABLE 10.

HIV INFECTION : THAILAND 1984–1988.

Category	1984	1985	1986	1987	1988	Total
AIDS	1	1	0	6	2	10
ARC	0	6	8	13	11	38
Asymptomatic HIV Infection	0	5	10	174	2 901	3 090
Total	1	12	18	193	2 914	3 138

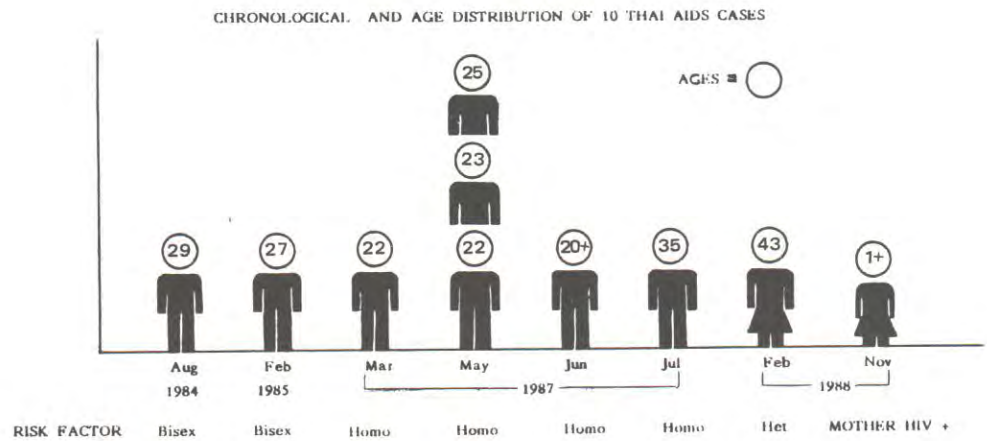


Fig 4. Chronological and Age Distribution of 10 Thai AIDS Cases.

2. Serological Survey for HIV Infection

Since the end of 1984 serological survey have been done for several purposes; surveillance and case-finding. Prevalence of HIV infection among homosexuals in Thailand in 1985 appeared to be similar to the 1% among homosexuals in San Francisco in 1978, earliest site of the AIDS epidemic[14]. By the end of 1986 and the beginning of 1987 donated blood screening was started at the National Blood Centre of The Thai Red Cross Society in order to avoid using HIV infected blood.

The data obtained at the early phase of the survey was somewhat fragmentary, and it has been subsequently better organized.

2.1 Screening of Healthy Workers

Because of the newly issued regulation of the Saudi Arabian Government requiring all workers who apply for entry visas to be HIV non-inflicted persons, blood testing has been done more widely since January 1986. This regulation has burdened both the laboratory work-load and economic loss for reagent purchasing. At the beginning of the response to this regulation, at least 4 laboratories were involved namely at the Division of Virology, Siriraj Hospital; at the Microbiological Laboratory of the Faculty of Medicine Chulalongkorn University, at the Faculty of Medicine Ramathibodi Hospital and Bang-Rak Hospital of the VD Control Division. On subsequent occasions some laboratories of large general hospitals, both government-owned and privately-owned have participated in the testing programme. Cumulative results on workers screening is shown in the Table 11.

TABLE 11.

SCREENING OF HEALTHY THAI WORKERS FOR ANTI–HIV ANTIBODIES, 1986–1988.

Year	No. Tested	No. Anti–HIV Positive
1986	46 129	0
1987	67 496	6*
1988**	58 526	13***

*Homo–bisex = 2, heterosex male = 1, heterosex female = 1, blood recipient = 1, unknown = 1.

**Up to October 31, 1988.

***Heterosex male = 1, IVDA = 1, under investigation = 11.

2.2 Sero-Surveys among High Risk Group

At the beginning, due to the limitation of reagent supply, small scale pilot surveys were made by the Venereal Diseases Control Division among the expected high risk groups at two tourist locations: the beach resort in Pattaya and the Patpong area in Bangkok with the assumption that the hospitality girls and gay men in those areas would acquire HIV infection from infected visitors. During the same period of time, at the Division of Epidemiology (Field Epidemiology Training Programme), Office of the Permanent Secretary of the Ministry of Public Health, Venereal Disease Division of the CDC in collaboration with the Division of Virology, Faculty of Medicine Siriraj Hospital, later on acted as the WHO Collaborating Centre on AIDS, also conducted a survey including homosexual men, prostitutes, prisoners, intravenous drug users (IVDU), thalassemic patients, etc[14]. At this stage of study, only a few HIV-infected persons have been identified. Results of those studies as tested by ELISA and confirmed by Western-blots are presented in Table 12-14[15,16].

TABLE 12.

SEROLOGICAL SURVEY AMONG HIGH RISK GROUPS:BANGKOK AND PATTAYA, FROM APRIL 1985 TO APRIL 1986[15].

Period	Category	No. Tested	No. Positive	
			ELISA	WB
April 1985	Homo/Bisexual Male	127	3	3 (1.47%)
	Prostitute Female	77	0	0
		204	3	
Oct. 4, 1985 to Jan 30, 1986	Homo/Bisexual Male	720	17	6 (0.83%)
	Prostitute Female	2 880	11	0
	Heterosexual Male	309	0	0
		3 903	28	
April 23, 1986	Homo/Bisexual Male	532	4	3 (0.56%)

TABLE 13.

PREVALENCE OF ANTI–HIV ANTIBODIES IN HIGH RISK GROUPS IN THAILAND, OCTOBER 1985 TO JANUARY 1986[16].

Sexual activity and locality	No. Tested	No (%) with antibodies to HIV by : ELISA	Western–Blot
Homosexual male prostitutes in :			
Bangkok	476	11 (2.3)	0*
Beach resort	244	6 (2.5)	6 (2.5)
Total	720	17 (2.4)	6 (0.8)
Female prostitutes in :			
Bangkok	916	1 (0.1)	0
Beach resort	1 964	10 (0.5)	0
Total	2 880	11 (0.4)	0
Sexually active heterosexual men in :			
Bangkok	95	0	0
Beach resort	214	0	0
Total	309	0	0

TABLE 14.

ANTI–HIV ANTIBODIES PREVALENCE, THAILAND 1985.

Category	No. Tested	No. Positive ELISA
Homosexual Male (Prostitutes)	101	1*
Thalassemic Patients	100	2**
Female Prostitutes	100	0
IVDA	99	0
Male STD Patients	100	0
Blood Donors (February–June 1985)	100	0
Total	600	1

*Positive by ELISA and Western–Blots.

**Weakly reactive on two dependent ELISA assays done singly at different occasions and not confirmed by the Western–Blots.

2.3 Research Grant from the National Research Council

The Medical Branch of the National Research Council has also realized that the AIDS problem is a priority area of study. Three research projects have been funded in order to collect information on the prevalence rates of HIV infection among several high risk groups.

At Ramathibodi Hospital, on screening 800 subjects which comprised of 200 homosexual males, 300 IVDAs and 300 blood recipients, none exhibited a positive anti-HIV reaction[17]. In Chiang Mai, a tourist attraction center in the North, anti-HIV positive in the high risk individuals were identified[18]. Another study at Siriraj Hospital revealed one anti-HIV reactor (a bar girl) in Pattaya among 1372 individuals tested (Table 15)[19]. The prevalence rates before 1988 shown in these studies are still low even among a presumably high risk population.

TABLE 15.

SEROSURVEY FOR HIV INFECTION AMONG HIGH RISK GROUPS, THAILAND 1987[19].

Category	No. Tested	No. Positive
Hospitality Females	421	1
Prostitutes : Samut Sakorn	107	0
Masseuses : Bang Saen	60	0
Bar–Girls and Masseuses : Pattaya	254	1
Male Prisoners at Lat Yao*	313	0
IVDA at Vajira Hospital (Male 311; Female 8)	319	0
Blood Donors at Siriraj Hospital	319	0
Total	1 372 (Male 874; Female 498)	1

*Among 313 prisoners at Lat Yao, 18.5% were IVDAs and 12.8% were homo/bisexual.

2.4 Laboratory Facilities

The first blood screening assay for the detections of anti-HIV became available in the USA in March 1985. In July 1985, anti-HIV testings as the sero-surveillance study in selected population was conducted at the Department of Microbiology, Faculty of Medicine Siriraj Hospital. The reagent used was the first generation ELISA test kits from Abbot Laboratories, provided by the Centers for Disease Control, USA. Since the laboratory had already been well-equipped for ELISA systems in viral study, the ELISA screening test for anti-HIV could be established as a research study and service immediately in July, 1985. In this initial phase the ELISA reactive sera were sent to the US-CDC for Western-Blot testing for confirmation.

In 1986, the ELISA commercial kits for anti-HIV manufactured by many companies in the USA as well as Europeon countries became available in Thailand. The three medical schools in Bangkok (Siriraj, Chulalongkorn and Ramathibodi Hospitals) and one private laboratory (RIA center) had established the anti-HIV testings by ELISA. The laboratory unit of the Venereal Disease Division, Department of Communicable Disease Control was strengthened to increase the ability in diagnosing AIDS. The anti-HIV testing by ELISA started in 1986. The National Blood Center, Thai Red-Cross Society initiated the base-line study for anti-HIV in some groups of blood donors in October 1986.

In mid - 1986, the immunoblot (Western-Blot) technique for confirmatory test was set up in Chulalongkorn and Siriraj Hospitals. The Western-Blot test kits were purchased from abroad. These two laboratories received the reactive sera from other laboratories and did the confirmatory test.

The laboratory service for anti-HIV testings by ELISA commercial kits was expanded dramatically in the early of 1987. This expansion resulted as the impact of the request of Government of Saudi-Arabia. The workers who applied for visa to that country needed to have

the AIDS non-infliction certificate. The 4 government hospitals as well as 5 private hospitals performed the physical examinations and laboratory services including anti-HIV testing for the Thai workers. More laboratories in the government hospital as well as private hospitals and private laboratories established the anti-HIV screening test using the commercial kits from various companies.

In January 1987, the voluntary screening of blood donors was implemented at the National Blood Centre. The blood bank at Siriraj Hospital established the facilities to screen all units of blood in July 1987. In October 1987, the National Blood Centre set the anti-HIV testing as the compulsory screening to every unit of donated blood.

In the later part of 1987, the new screening test of gelatin particle agglutination (PA) was introduced. The sensitivity and specificity of this new test is comparable to those of the ELISA. The alternative confirmatory test by indirect immunfluorescence (IF) using the T-cell line infected with HIV was supplied by some distributors.

In 1987, more than 30 laboratories in Thailand had performed ELISA testing for anti-HIV, using commercial kits from 7 companies.

In 1988, the anti-HIV testing laboratory service was expanded. More than 63 laboratories all over Thailand offered screening service by either ELISA or PA or both. The reactive sera were sent for immunoblot confirmatory test in one of the 7 laboratories, namely Chulalongkorn, Siriraj, Khon Kaen and Chiang Mai Hospital, VD Division, Thai National Institute of Health and Bamrasnaradura Infectious Hospital.

Since October 1988, all provincial general hospitals (almost 80 laboratories) have been equipped with necessary laboratory facilities to perform ELISA tests. Several national workshops for laboratory personnel have been organized. It is expected that all donated blood used in Thailand except in an emergency case will be screened. Surveillance and survey studies will be supported by these existing laboratories as well.

The new screening tests are now available. They are passive hemagglutination test and the rapid immunodot test. The immunodot test is promising. The serum could be tested individually as the membrane dotted with recombinant HIV antigen in a single test package. The result could be read by naked eye within 10-15 minutes. This test is recommended as the screening test for the fresh serum or plasma, but not suitable for the frozen and thawed samples. The specificity and sensitivity in selected group of population in Thailand by this test should be further investigated.

In the late 1988, the National Institute of Virus Research, NIH, Thailand incooperated with the Japanese experts has cultured the HIV infected T-lymphocyte cell line. The cells were fixed on slide and provided to some laboratories as the alternative test for confirmation.

3. Centre for Prevention and Control of AIDS (CPC-AIDS)

As AIDS is important emerging problem, in October 1987, the Ministry of Public Health of Thailand (MoPH), established a new center at the division level: "Centre for Prevention and Control of AIDS-(CPC-AIDS)" within the Department of Communicable Disease Control (CDC) to take the responsibility of the AIDS issue. Instead of using the mechanism of the VD Division MoPH is implementing AIDS prevention and control through this newly established agency. The terms of reference of this centre are implementation and coordination of the following activities.

Planning and evaluation
Epidemiology
Health Education and Public Relations

Organizing Training and Seminar
Medical and Social Counselling
Laboratory Services
Promotion of Study and Research.

4. *AIDS Epidemiology and Information Dissemination*

4.1 Reporting System

The MoPH announced that AIDS is a notifiable disease. Either full-blown AIDS or HIV-infected individuals must be reported to the authority. Whenever detected, directors of hospitals, clinics and laboratories are requested to submit the report to the relevant authorities at the earliest convenience without any obiligation as follows.

4.1.1 Within Bangkok

For the government agencies, reports must be sent directly to the Health Office Division of the Communicable Disease Control of Bangkok Metropolitan Administration (BMA).

AIDS/HIV-infected persons identified at private hospitals and clinics in Bangkok must be reported directly to the Permanent Secretary of MoPH.

4.1.2 Anywhere outside Bangkok

For both government agencies and private organizations, reports must be forwarded to the Provincial Chief Medical Officers.

4.2 Case Record Form and Epidemiological Report

A case record form has been developed for use by all responsible officers in institutions where cases are managed and/or under follow-up process. All information is updated at the CPC-AIDS and since November 9, 1987 bi-weekly epidemiological reports have been released to related agencies without subscription fee. The HIV-infected persons and patients' names are kept confidentially and the notifications are identified by the relevant coding number.

4.3 AIDS Hotline Telephone and Postal Office Box

In order to give correct information on AIDS to the general public, and AIDS hotline telephone (Tel 282-6620-3) has been set up in 1987 and a special postal office box (P.O.Box 228 : Ratchadamnoen) has been provided. The CPC-AIDS authority in cooperation with the Public Relations Subcommittee has prepared common answers on AIDS for the general public.

4.4 Case Follow-up and Contact Tracing

Persons who have been notified as ARC and HIV-infected individual are followed up every one or two months to monitor the progress of the infection. The counselling unit of the CPC-AIDS is responsible for coordinating and implementing the counselling, educating as well as psychological management. Tracing of contacts will be carried out at the same time.

5. *Screening of Donated Blood*

At present, in Thailand there are approximately 700 000 units of donated blood per annum. Out of this number, approximately 200 000 units are used within the Bangkok Metropolitan and its vicinity. Blood screening for HIV was initiated at the National Blood Center approximately in January 1987 with a limited capacity of about 200 samples per day. Subsequently, since October 1987, the National Blood Center has expanded its capacity to screen every unit of donated blood before to the number of about 1000 units per day (Table 16). Since October 1988, necessary equipments for blood screening by ELISA test have been

provided in order to facilitate laboratories in all provincial hospitals to perform the anti-HIV antibody screening test. Particle agglutination test (PA) is also promoted to be used in those laboratories.

TABLE 16.

ANTI–HIV ANTIBODIES SCREENING OF DONATED BLOOD AT THE THAI NATIONAL BLOOD CENTER, OCTOBER 1987–SEPTEMBER 1988[20].

Month	No. Tested	Anti–HIV	Rate*
1987			
October	17 807	2	11.2
November	22 821	1	4.4
December	20 970	2	9.5
1988			
January	16 901	1	5.9
February	20 305	4	19.7
March	16 279	2	12.3
April	17 087	7	41.1
May	17 665	14	79.2
June	19 135	10	52.3
July	18 358	9	49.0
August	23 283	25	107.4
September	19 406	7	36.1
Total	230 017	84	36.5 (or 0.037%)

*Remark : Rate per 100 000 units of donated blood tested

6. *Financial Support from the Government*

In July 1987, the Standing Committee on Health and Environment of the House of Parliament realized that AIDS was a serious problem. In this connection, the Chairman of the Committee asked the Director General of the CDC and technical experts from universities to give a brief review on the AIDS situation in Thailand. Ministry of Public Health with strong support of the House Committee had also requested a special budget from the government in order to implement its immediate plan of action on AIDS prevention and control. As a result, the Thai government has allocated approximately US$ 1.72 m for the 1987 to 1990 fiscal years.

7. *HIV Infection among Intravenous Drug Abuser (IVDA)*

As mentioned earliers, Thailand is facing a major intravenous opiate dependence problem, affecting mostly adolescent males. Heroin abusers live mainly in and around Bangkok and to a lesser extent in the Northern region of the country. In 1985, there were 94 drug dependence treatment centers operating under the government license of which 32 were in Bangkok (Table 3). During the last 5 years the number of clients coming for treatment per year was about 40 000 to 60 000 in number.

Before 1988, anti-HIV serological studies were done on IVDAs and revealed a low prevalence rate of HIV infection. For example, a study was conducted at Thanyarak Hospital between August and December 1987. 3190 drug dependents were tested for anti-HIV antibodies. 33 individuals or 1.03% were anti-HIV positive which were confirmed by Western-blots (Table 17)[21].

TABLE 17.

INCIDENCE OF ANTI–HIV ANTIBODIES AMONG IVDAs AT THANYARAK HOSPITAL, AUGUST–DECEMBER 1987[21].

1987	No. Tested	No. Positive	%
August	192	1	0.52
September	850	9	1.06
October	810	7	1.05
November	735	9	1.22
December	603	7	1.16
Total	3 190 *	33**	1.03

*Male = 3 074; Female = 116.

**All were males, aged between 20 and 39.
All used intravenous heroin.
28 cases or 84.84% shared the needle with others.

TABLE 18.

INCIDENCE OF ANTI–HIV ANTIBODIES AMONG IVDA AT THANYARAK HOSPITAL, JANUARY–OCTOBER 1988[21]

1988	No. Tested	No. Positive	%
January	768	9	1.17
February	748	30	4.01
March	877	95	10.83
April	650	96	14,77
May	667	129	19.34
June	822	191	23.24
July	629	181	28.77
August	868	280	32.25
September	807	252	31.23
October	728	224	30.77
Total	10 744	1 520	14.15

During January to December 1987, an epidemiological study on HIV infection was conducted by Suwanagool and his associates at Siriraj Hospital financially supported by the National Research Council which included 1372 individuals. None of 319 IVDAs were infected by HIV (Table 15)[19].

In January 1988, results of testing for HIV infection among the new intake IVDAs at the Bangkok Metropolitan Administration (BMA) still showed a low prevalence rate (4 out of 490 or 0.8%)[22]. Only one month later, in February, blood screening for HIV infections among IVDAs done by the BMA and Thanyarak Hosptial, however, were concomitantly higher in frequency (Tables 18, 19 and Figure 5)[21,22]. At the BMA alone 829 samples of sera were

taken from new intakes of IVDAs on 10 occasions between February 6 and February 15 and 204 samples or 4.5% were anti-HIV positive as confirmed by the Western-blots. At Thanyarak Hospital, approximately 4 per cent of 748 serum samples were also positive (Table 18)[21]. The prevalence rates has increased sharply to about 30 per cent within a few months later. This is an alarming situation. The reason why the prevalence rate among IVDAs has sharply increased within a short period of time is under intensive investigation.

TABLE 19.

SERO–SURVEY OF HIV INFECTION AMONG IVDAs AT CLINICS OF BMA JANUARY–MARCH 1988[22].

Date	Number Tested	Positive Anti–HIV*	%
1988			
January 1	104	0	
January 2	124	2	1.62
January 3	95	2	2.11
January 4	87	0	
January 5	80	0	
Total	490	4	0.80
February 6	58	20	34.48
February 7	101	36	35.64
February 8	67	7	10.45
February 9	92	11	11.96
February 10	95	29	30.53
February 11	85	36	42.35
February 12	84	26	30.95
February 13**	14	1	7.14
February 14	86	23	35.39
February 15	147	15	10.20
Total	829	204	24.5
March 16	75	15	20
March 17	103	15	20.56
March 18	152	20	13.15
Total	330	50	15.15

*Positive by ELISA and Western–Blots

**Rehabilitation Centre

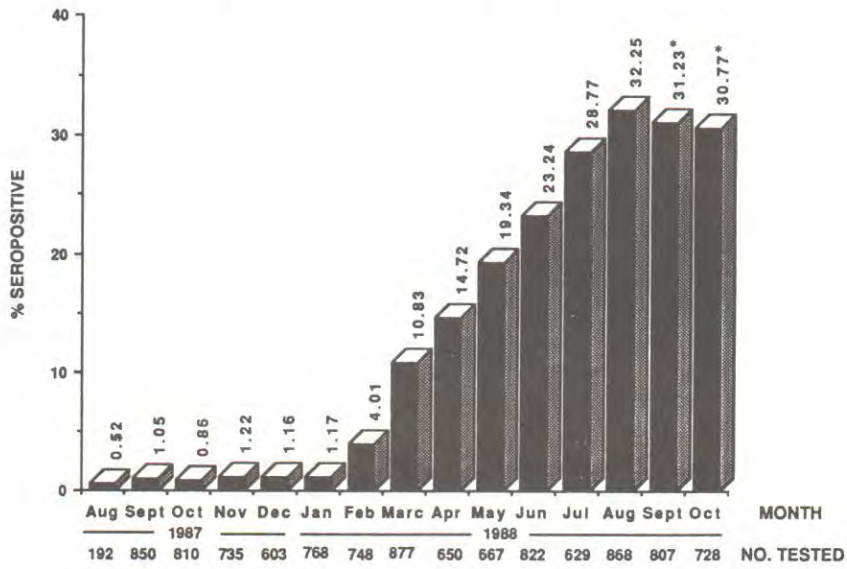


Fig 5. HIV—Infected Intravenous Drug Abusers at Thanyarak Hospital, Thailand 1987—1988.

*Selected testing only previous seronegative and new patients

Realizing the big problem of IVDAs and HIV infection, in May 1988, CDC then organized a national workshop "Measures for the Prevention and Control of AIDS in the High Risk Groups" which discussed intensively on IVDAs. WHO Regional Office for South-East Asia also organized an WHO Intercountry Workshop on the Drug Problems and AIDS in Pattaya and Bangkok a couple of days thereafter.

8. Gay Clinic

A special clinic for homo/bisexual males was set up in the Patpong area of Bangkok in 1985. In clinic is aimed to be the focal point of approach for this high risk population in the screening of HIV infection and providing health education.

9. Serosurvey among Hospitality Population

In 1988, a serosurvey was done in hospitality population in four tourist attraction areas. A total of 6 651(5 759 females and 892 males) was tested and 36 seropositive for HIV infection (0.54%) were identified (Table 20)[23].

In addition 41651 hospitality persons throughout the country were screened and 46 seropositive were revealed.

TABLE 20.

SERO–SURVEY AMONG HOSPITALITY POPULATION, 1988.

Locality	Male			Female		
	No. Tested	Positive	%	No. Tested	Positive	%
Bangkok	194	1	0.52	1 867	6	0.32
Chonburi	382	13	3.4	2 153	3	0.14
Chiang Mai	235	7	3.0	1 092	4	0.37
Phuket	81	2	2.47	647	0	–
Total	892	23	2.58	5 759	13	0.23

10. Role of World Health Organization

10.1 WHO Collaborating Centre on AIDS at the Department of Microbiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand. (See role of Mahidol University).

10.2 Short Term Plan of Action[24]

In the short term plan of action on AIDS prevention and control in Thailand proposed by the Thai government to the Global Programme on AIDS, WHO has directed the goal of prevention in the transmission of AIDS among the Thai population and to reduce the infection rate and morbidity from the disease. The main strategies on work plan are as follows.

1. Health Education Programme

1.1 Information to high risk groups.

By sending the mobile teams to perform group health education in all the high risk groups' working place in large provinces and tourist centers.

Homosexual/Bisexual males
Prostitutes
Prisoners
Drug addicts

1.2 Information to the General Public and Health Care Workers.

Besides setting up the hotline telephone, AIDS topics have been included in the national curriculum in high schools. Seminars have been organized for high level education administrators. Public health education is being continuously given through all kinds of mass media - namely press, radio and television. Other health educational materials have been distributed e.g. posters, pamphlets, stickers and educational packages on AIDS. Handbook on prevention and control of AIDS has also been produced to educate the health and health-related personnel.

1.3 Promotion of Condom Usage.

Condoms will be distributed free of charge through hospitals and VD clinics in order to promote their uses among the high risk population.

2. Epidemiological Surveillance.

2.1 Strengthening of Laboratories for HIV Screening

The existing laboratories have been improved in terms of screening and confirmatory facilities for HIV infection. Additional laboratory centers will be established at governmental

agencies. Five of which will be supported by the GPA. The laboratories which will be established are as follows:

1. Venereal Disease Division
2. Infectious Disease Hospital (Bamrasnaradura Hospital)
3. Central Chest Hospital
4. Prapradaeng Hospital
5. Two CDC Regional Technical Coordinating Centers
6. Nine Regional Venereal Disease Centers
7. Seventy Regional/Provincial General Hospitals

Five of these laboratories will be equipped with confirmatory tests, e.g. the Western-Blots and Immunofluorescence. Other government and private medical institutions will also be stimulated to build up diagnostic facilities.

2.2 Testing the High Risk Groups.

Sero-surveys will be conducted among high risk groups, e.g. IVDAs, homo/bisexual males, female prostitutes, hospitality girls and prisoners. ELISA positive samples will be confirmed by the Western-Blots tests and positive individual will be closely follow-up for educating and counselling. Contact tracing will also be performed.

2.3 Screening of Donated Blood.

Every unit of donated blood in Thailand will be screened for anti-HIV antibodies by simple tests e.g., ELISA or PA.

2.4 Reporting of HIV-Asymptomatic Carriers, ARC and AIDS cases.

The existing reporting system using standard case record forms as mentioned earlier will be strengthened.

2.5 Case Follow-up and Contact Tracing.

The HIV infected persons will be follow-up and counselled every one to two months.

3. Treatment

3.1 Infectious Ward for AIDS Patients

At the beginning, AIDS patients were treated at Ramathibodi Hospital and Chulalongkorn hospital. Due to the fear of physicians, nurses and other medical personnel, it is not the policy of several general hospitals to admit AIDS patient. To resolve this situation, a treatment facility has been set up at Bamrasnaradura Infectious Hospital of the Department of Communicable Disease Control. Diagnostic facilities for several kinds of opportunistic infections will also be provided and strengthened.

3.2 Gay Clinic.

The existing gay clinic at Patpong will be improved.

4. Training

Regular training will be given to medical officers, senior health officers, nurses, social workers, psychotherapists as well as school health educators. Priority is set for those working in the current drug rehabilitation clinics and 70 general hospitals. More workshops for laboratory screening for HIV infection will be organized for laboratory personnel to enable them to perform the screening test throughout the country.

Group education activities for senior medical and health personnel to participate in international seminars, meetings workshops and courses as well as group observatory tours will also be organized.

WHO allocated approximately US$ 500 000 for use in the short term plan of action.

10.3 Medium Term Plan of Action.

On August 1-2, 1988, CDC organized a workshop to formulate a-three year plan of action (medium term plan) for prevention and control of AIDS. The participants included health administrators, technical experts, scientists and social welfare workers, etc. from governmental and private agencies. The Global Programme on AIDS or GPA sent technical consultants to help in conducting this workshop.

A three-year plan aimed at the coordination between government and private sectors as well as other supporting organizations. With the conceptual principle that prevention and control of AIDS should harmonize with the national health policy concerning health care-taking for the general population in the frame work of human rights, as well as the avoidance of discrimination of the patients from the society.

Due to the fact that the risk factors of contracting HIV infection in Thailand are not quite similar to those appearing in several other countries. Unlike the countries in North America and Europe, it is now well known that the highest risk group in Thailand is the intra-venous drug users. It is expected that HIV infection will spread further from IVDAs to their sexual partners and finally result in the fetal infections. Moreover, donated blood is prone to be more infectious, and therefore, needs more concentration. Even though the organ transplantations and artificial insemination have so far not created any problem, screening of donors must also be properly carried out.

Action plan stresses more intensively on the medical detoxification and rehabilitation as well as other social manouvers for IVDAs. Education and information will be intensively and regularly provided for this group. Follow-up the infected cases which includes for medical check-up and counselling must be continued. Behavioural study will also focus on the teen-agers and young adolescents in order to guide the correct pattern of their life-styles.

Prevention and control of sexually transmitted diseases is also one main point of strategies which prevents spreading of HIV infection. Health education concerning "safe sex" will be given on a larger scale and more intensively to the higher risk groups. Usage of good quality of condom in all risky sex occasions will be stimulated through advice and wide distribution of condoms. Inspection for the condom's quality must be taken into consideration.

Due to expected heterosexual spreading of HIV infection, physicians, nurses and health personnel have to be informed to be aware of maternal-fetal infections. In this regard, training course will be provided in care of patients with HIV infection, especially in children. General hospitals must be alert in preparing facilities for the management of AIDS. Special safety guidelines for health care workers will be delineated and distributed.

The formulation has been completed and proposal has been submitted to GPA. It is expected that, the support commencing on January 1989 will amount to US$ 4.9m which included support from the Royal Thai Government (US$ 1.2m) and several international donating agencies (US$ 3.7m).

11. Role of the Universities

11.1 WHO Collaborating Centre on AIDS at Mahidol University, Bangkok, Thailand

In May 1986, the WHO Assembly in resolution WHA 39-29 requested the Director General to explore ways of increasing extent and type of WHO cooperation with Member States in combating the AIDS epidemic and to mobilize extra-budgetary resources for this purpose. Accordingly, WHO Global Programme on AIDS (GPA) was formally established (called at the beginning as Special Programme on AIDS-SPA) and collaboratings centres on AIDS have been designated in the Member States of all WHO regions.

Workshops held by WHO Collaborating Centre on AIDS, Thailand

First International Workshop on AIDS
15 - 19 December 1986

Second International Workshop on AIDS
14 - 19 March 1988

In December 1985, an Intercountry Consultative Meeting was held in WHO-SEAR in New Delhi to discuss the AIDS situation in South East Asian Regions. It was agreed that two WHO Collaborating Centres on AIDS should be set up in India and Thailand. The Department of Microbiology, Faculty of Medicine Siriraj Hospital, Mahidol University was designated as one of the 27 centres around the world. The term of reference of these centres, delineated by WHO covers widely, ranging from screening of HIV infections, advice on surveillance of retroviral diseases, particularly AIDS, ARC and other types of HIV infections, to train laboratory and public health personnel and to organize meetings and workshops on behalf of WHO as well. In December 1986, an Intercountry Workshop on HIV Antibody Screening was organized at the centre in Bangkok with 2 participants from India, one participant from Indonesia, one participant from Maldives, one participant from Nepal and 3 participants from Thailand. Several local observers were allowed to participate in the lecture sessions. Before the training course, except India and Thailand, no laboratory in countries in the region had facilities to perform any screening test for HIV infection.

The second workshop was held between March 14 and March 19, 1988. Thirteen participants came from Bangladesh, Bhutan, DPR Korea, Indonesia, Maldives, Nepal, Sri Lanka and Thailand. Two WHO-supported national workshops for the same purposes were organized at the centre in November 1987 and November 1988. Staff and scientists of the centre have opportunities to attend WHO consultative meetings, international meetings on AIDS. Some of them have been sent by WHO to countries in this region as the short term consultants. Staff have been nominated as members of the national committee and subcommittee on the prevention and control of AIDS. They have participated more than 30 sessions of panel discussions on AIDS for local participants (physicians and health personnels) and have also joined in various types of educational activities organized either by governmental or private organization. Educational materials have also been produced by our staffs including handbook, booklets and pamphlets. By the end of 1988, approximately 35 000 samples of blood have been screened at the center by ELISA and other appropriate tests. As reference centre, approximately 3 000 samples, either positive sample screened at the centre itself or referred from other laboratories in Thailand and abroad, have been confirmed by Western-Blots method in this laboratory.

Immunological procedures to assess the immune status of subjects also available at the Division of Immunology of the same department. The centre also work closely with Division of Infectious Diseases and Department of Preventive and Social Medicine of the same medical school.

There is another medical school under the umbrella of Mahidol University - Faculty of Medicine, Ramathibodi Hospital. Centre for Community Medicine, Department of Internal Medicine and Clinical Pathology Laboratory also perform several studies on AIDS. Besides the screening services, Clinical pathology Laboratory has a research project to develop its own reagents for AIDS screening.

First National Workshop on AIDS
30 November - 3 December 1987

Second National Workshop on AIDS
12 - 16 December 1988

TABLE 21.

SOME ACTIVITIES OF WHO COLLABORATING CENTRE ON AIDS, BANGKOK, THAILAND, 1985–1988.

Category	1985	1986	1987	1988
Testing Service				
Blood Donor Screening	–	–	2*/9 025 (Jun–Dec)	0/2 555 (Jan)
Healthy Individual (Including workers)	–	0/13 624	0/4 666	3**/3 971
Total		0/13 624	2/13 691	3/6 523
Confirmatory Tests				
Siriraj Hospital	1/35	0/34	6/216	70/881
Referred From Other Hospitals	4/26	3/18	57/372	662/1 345
Burma	–	–	0/2	1/1
Total	5/61	3/52	63/590	733/2 227
% Positive	8.20	5.77	10.68	32.88

* Two individuals were identified at the Centre : One bisexual and one heterosexual males.
From February 1988, screening tests for donated blood were done at Siriraj Blood Bank Unit. Up to December 31, 1988, 19876 were tested and 13 HIV–infected and 5 indeterminate results were found.

** All were heterosexual males aged 30, 31 and 36 years old.

11.2 Faculty of Medicine, Chulalongkorn University

Chulalongkorn University Hospital diagnosed its first case of AIDS in February 1985. The patient was a U.S. male homosexual who had been in Thailand for 2 years. He was referred by a private dermatologist to have an immunologic work-up for his recurrent bacterial and fungal cutaneous infections. Although some defects of cell-mediated immunity could be detected on initial evaluation, but diagnosis of full-blown AIDS could not be made until February 1985 when he developed pneumocystis pneumonia. During the same month, another Thai male homosexual with full-blown AIDS was also diagnosed. This second patient had systemic cryptococcal infection, and as the first patient, a profound decrease of $T4^+$ cells and the T4/T8 ratio. Stored sera from both patients were anti-HIV positive when the test became commercially available in May 1985.

Since then the group at Chulalongkorn Hospital has been gradually involved in the AIDS scene of Thailand. It was the first hospital in Thailand which set up the in-patient facility for AIDS. The AIDS ward served as the prototype for the Communicable Disease Hospital of the Ministry of Health as well as for other medical school hospitals. The group has seen over 14 cases of AIDS up to February 1989.

The Immunology Laboratory has served the Ministry of Health as the reference laboratory for confirmatory Western blot test and the T cell study. It also collaborated with other laboratories to test the sensitivity and specificity of various commercial ELISA test kits in order to make recommendations to the Ministry of Health to acquire the test kits for provincial hospital laboratories. In addition, the experts from Chulalongkorn University Hospital have served as members and consultants of several national and international AIDS Committees including the newly established International AIDS Society. They have given lectures and talks on AIDS to several medical and non-medical organizations including the general public in Malaysia.

The group has been interested in the anti-HIV testing using saliva and they are now developing the dipstick anti-HIV testing using saliva and they are now developing the dipstick anti-HIV testing using protein A-sheep red cell technique. They also described recently the diagnosis of transplacental HIV infection by the use of IgM immunoblot technique. As far as the therapeutic trial is concerned, the group has been involved in the therapeutic trials of Imuthiol and gossypol in asymptomatic HIV patients.

Chulalongkorn University Hospital is closely linked to the Thai Red Cross Society. The National Blood Centre of the Thai Red Cross Society started randomized anti-HIV screening of their donated blood in 1986, at the time that AIDS was not booming. Mandatory screening of all units of blood started in August 1987.

The Science Division of the Thai Red Cross Society, in collaboration with the Institute of Population Studies, Chulalongkorn University, has set up the Center for AIDS Research and Education (CARE). The Center has focused its effort in the education and promotion of AIDS awareness among male and female sex workers, particularly the strategies to promote the practice of safe sex.

For 1989, which is the 125th anniversary of the League of Red Cross and Red Crescent, the Thai Red Cross Society will join the effort of the League to fight against AIDS. Several AIDS campaign activities will be organized during 1989-1990. The first of such events will be a series of training course about AIDS for school teachers throughout the country. The first course is schedule on May 15-17, 1989. It is intended that these teachers will be enabled to train other teachers and students in their own provinces.

11.3 Chiang Mai University

The Department of Microbiology of Faculty of Medicine, Chiang Mai University is one among our well equipped laboratories with qualified scientists. In 1986, with the financial support from the Medical Branch of the Thai National Research Council, Immunology Section of the Department has started to conduct the serosurvey for anti-HIV antibodies among homosexual and other high risk groups by ELISA method and finally confirmed by the Western-Blot test. Moreover, several immunological parameters (T-helper : T-suppressor ratio, lymphocyte T test, IL-1 production of the monocytes and IL-2 production of the lymphocytes) which can be used as the monitoring tools for HIV-infected persons are also performed. Apart from the serosurvey, the section also provides confirmatory test referred from other laboratories in the upper part of the Northern Region. The section has also collaborated with the Regional Venereal Disease Control Centre to study prevalent rate among prostitutes and VD patients. Chiang Mai University has also taken part in several health educational activities. More than 20 sessions of lectures and seminars have been organized for health care workers, soldiers,

policemen, school children, college students, School Teacher-Parent Associations,Rotary and Lion Club members etc. More than 15 000 folders on the prevention of AIDS have been distributed. Faculty members are joined in the Provincial AIDS Prevention and Control Committee. Some activities of Immunology Laboratory is shown in the Table 22.

TABLE 22.

SOME ACTIVITIES OF IMMUNOLOGY LABORATORY AT CHIANG MAI UNIVERSITY, 1986–1988.

Category	No. Tested	No. Positive
Hospitality Male	122	1
Homosexual Male	415	3
Heterosexual Male	141	5
In–Patient – Heroin Abuser Male	40	16
– Heterosexual Male	31	6
Hospitality Female	219	1
Heterosexual Female	63	0
In–Patient – Heroin abuser Female	1	1
Blood Donor 1985	122	0
1988	20 000	80*

*Figure from Chiang Mai Maharaj Hospital Blood Bank Unit.

11.4 Role of Khon Kaen University

Khon Kaen University, the only one university in the Northeastern Region of 17 provinces with one-third of population of Thailand, plays very important role in the AIDS monitoring and educating the public. The Faculty of Medicine AIDS Committee is responsible for all activities associated with patient management, prevention, control and research on AIDS. Activities undergoing include:

1. Disease monitoring which has been carried out routinely through the University (Srinagarind) Hospital of the Faculty of Medicine. Its diagnositic laboratory is one of AIDS-confirmatory test Centers in Thailand.

2. Monthly average, about 3 000 samples of sera including blood donors and patients screening for AIDS are tested by ELISA, and about 20 samples of sera from different provincial hospitals in the region were analysed by Western-Blot.

3. From time to time, research projects were set up to investigate AIDS-prevalence especially in the high risk groups. So far the anti-HIV antibodies prevalence among the groups except drug addicts has not been identified. Most of the cases attending hospital have history of either being Bangkok metropolitan residents for years or drug addicts.

4. The public health education programs on AIDS, undertaken by the Family Planning Unit, Faculty of Medicine have also been put forward for different levels of target populations. These include high school students and staffs, workers, military personnel, government officials, night-working men and women in public palours and clubs, health personnel and general publics. Different types of media were used with various occasions and audiences.

In conclusion, the epidemiological condition of AIDS in the Northeast of Thailand is still calm. However, due to the very high rate of population movement to town and such a big city as Bangkok and unemployments leading to social problems, e.g., drug addict, it is expected that the trend of AIDS prevalence in the Northeastern Region will be increasing. The Khon Kaen University then will have more roles in preventing the AIDS-spreading into the area.

11.5 Role of Prince of Songkhla University

The problem of AIDS in Thailand is beginning to spread, even in the Southern Region, especially Hat Yai and Phuket which attracts a large number of tourists. As the only academic center of Southern Thailand, Prince of Songkhla University has the responsibility to educate people with all levels of social and educational backgrounds and, in particular, the health care personnel in the fourteen Southern provinces.

Songklanakarind Hospital and the Faculty of Medicine

Within the hospital and faculty the following steps have been taken:

1. Basic information has been provided for hospital personnel by giving out summaries of articles in the Medical Faculty Newsletter and by small group lectures by specialists from the infectious disease divisions.

2. A seminar for hospital staff was held to explain how to prevent HIV infection spreading from patient or infected persons to another and give assurance of the low risk of acquiring the disease from patient to staff.

3. There has been a poster campaign and an information booklet directed at hospital personnel.

4. A questionnaire has been distributed to medical staff to evaluate the attitudes and understanding of physicians concerning the management of HIV infected individual or AIDS patients.

5. The university intends to set up a reference laboratory to serve the hospitals in the Southern Region for the testing of AIDS using the Western-Blot method.

6. Efforts have been made to attract research funding by encouraging members of the staffs to initiate research in areas such as a study of the sexual behaviour of high risk groups.

Outside the Hospital and Faculty

Outside the hospital progress has been made in these areas:

1. Education has been spread through the mass media-at the moment on Radio XI programme.

2. The Governor of Songkhla Province has been approached with the suggestion that a committee at the provincial level should be set up to deal with this problem of AIDS prevention and control throughout the province.

3. This issue has been raised in the joint committee which has been set up between the Ministry of Public Health and Prince of Songkhla University (Faculty of Medicine) to promote better health in the South of Thailand.

4. A campaign will be launched to increase general knowledge among school teachers and to add AIDS related information to the student's curriculum.

5. Regular meetings will be held with the other provincial medical schools to share information, discuss mutual problems and devise a consistent policy in handling and management this devastating illness.

12. Role of Non-Governmental Organization

12.1 The National Blood Centre

Under the organizational framework of the Thai Red Cross Society, the National Blood Centre is a non-profitable organization, which promotes the voluntary blood donation and distributes donated blood free of charge to both government-owned and private-owned hospitals. There are branches of the blood centres in every provinces throughout Thailand. Since by the end of 1986 the Centre has partially screened donated blood before distribution and subsequently screened all donated blood units, which is one of the most important measures against HIV infection. Frequency of seropositive donated blood is shown in Table 16. Counselling of HIV-infected donors has been provided through its "Care Centre". Besides this activity, Director of the Centre also served as committee member in the National Advisory Committee on AIDS.

12.2 Anti-AIDS Foundation

In October 1988, a non-governmental organization, "Anti-AIDs Foundation", was founded, with the main objectives as follows:

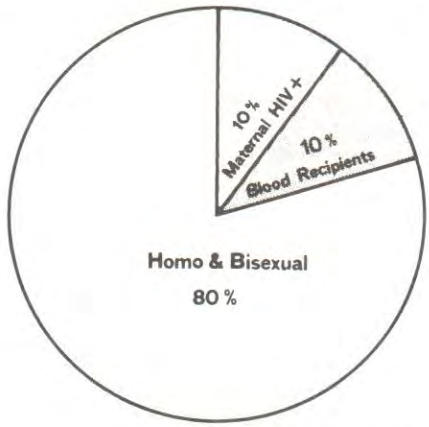
1. To provide and propagate the correct up-to-date educational information and knowledge on the prevention and control of AIDS.
2. To exchange technical information between all sectors involved in the prevention and control of AIDS.
3. To act as a centre in coordinating all activities on AIDS prevention and control.
4. To implement the programme for the control of AIDS and collaboration with all sectors both in the country and abroad.
5. To study and conduct research on AIDS.
6. To coordinate with other public organizations with the aim of public use or implement activities with the same purpose.
7. To conduct and implement all activities without involvement in any political issue.

To achieve these objective, campaign programme for financial support will be launched and public donations are welcomed.

Address of Anti-AIDS Foundation is:
Devavesama Palace,
7th Floor, Blg 3,
275 Samsen Road,
Bangkok 10200, Thailand.

Interesting Figures on HIV Infection in Thailand

As mentioned earlier that, Centre for Prevention and Control of AIDS has the responsibility on several AIDS issues. The following interesting figures on HIV infection in Thailand have been obtained from the Centre (Figures 6-8, Tables 23 and also see Table 10 and Figure 4).



AIDS (10 Cases)

Fig 6. Risk Factors of 10 Thai AIDS Cases.

ARC (38 Cases)

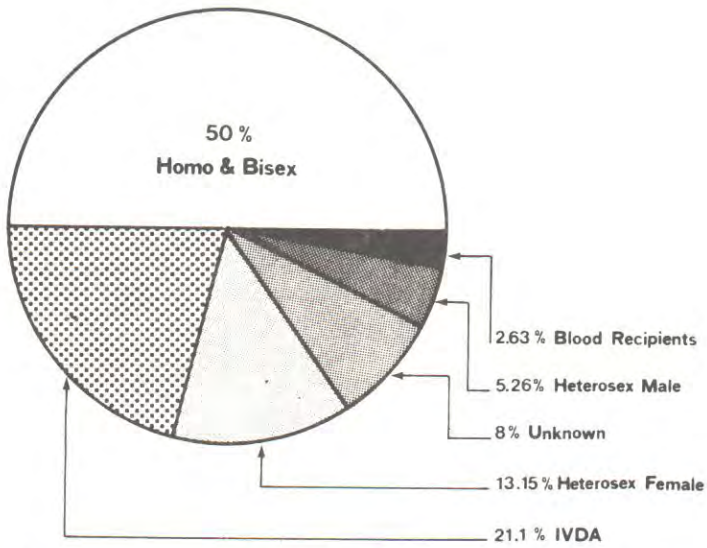


Fig 7. Risk Factors of 38 Individuals with AIDS–Related Complex.

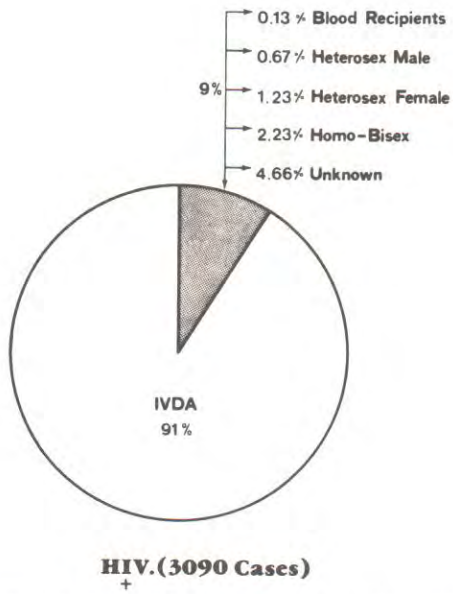


Fig 8. Risk Factors of 3 090 Healthy HIV–Infected Persons.

TABLE 23.

AGE DISTRIBUTION OF HIV–INFECTED PERSONS.

Age Group	AIDS	ARC	HIV
0 – 10	1	0	0
11 – 20	0	4	172
21 – 30	7	23	1 715
31 –40	1	9	950
41 – 50	1	0	120
51 – 60	0	0	33
61 – 70	0	0	4
Unknown	0	2	96
Total	10	38	3 090

Remark : Up to 31 December 1988.

Conclusion

In conclusion, Thailand has confronted a new threat of AIDS. The Ministry of Public Health has announced 1989 as **"Thailand Combat AIDS Year".** It needs, however, every effort to fight against this fatal disease. More coordination and cooperation to pool the existing resource from the government and private sectors for the prevention and control of HIV infection must be promptly strengthened. Additional international supports in term of finance and experts are essentially needed.

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Annex I

Laboratories Provided Anti-HIV Testing in Thailand (1988)

Government Hospitals

Bangkok and Vicinity Area

1. Bangrak Hospital
2. Bhumiphol (Air-force) Hospital
3. Bumrasnaradura Hospital, Nondhaburi
4. Central Chest Hospital
5. Chol-Pra-Tan Hospital, Nondhaburi
6. Chulalongkorn Hospital (Medical School)
7. National Institute of Health, Nondhaburi
8. Police Hospital
9. Pra-Mongkut-Klow (Army) Hospital
10. Pra-Pin-Klow (Navy) Hospital
11. Rajvithi Hospital
12. Ramathibodi Hospital (Medical School)
13. Siriraj Hospital (Medical School)
14. Tak-Sin Hospital
15. Thanyarak Hospital, Pathum-Thani
16. Vachira Hospital

Outside Bangkok

1. Apai-Phubet Hospital, Prajinburi
2. Bhuddha-Chinna-Raj Hospital, Pisanulok
3. Cholburi Hospital
4. Had-Yai Hospital, Sonkla
5. Koh-Samui Hospital, Suraj-Thani
6. Lumpang Hospital
7. Nakorn-Rajsima Hospital
8. Nakorn-Sri-Thammarat Hospital
9. Pa-Yow Hospital
10. Pra-Puthabat Hospital, Saraburi
11. Rajburi Hospital
12. Rayong Hospital
13. Regional Tuberculosis Centre 7 (Ubol-Rajthani)
14. Regional Tuberculosis Centre 9 (Pisanulok)
15. Regional Veneral Disease Centre 2 (Saraburi)
16. Regional Venereal Disease Centre 3 (Cholburi)
17. Regional Venereal Disease Centre 4 (Rajburi)
18. Regional Venereal Disease Centre 5 (Nakorn-Rajsima)

19. Regional Venereal Disease Centre 6 (Khon Kaen)
20. Regional Venereal Disease Centre 8 (Nakorn-Sawan)
21. Regional Venereal Disease Centre 10 (Chiang-Mai)
22. Regional Venereal Disease Centre 11 (Nakorn-Srithamamrat)
23. Regional Venereal Disease Centre 12 (Songkla)
24. Saraburi Hospital
25. Songkla Hospital
26. Songklanakarind Hospital (Songkla, Medical School)
27. Srinakarind Hospital (Khon Kaen, Medial School)
28. Suan-Dok Hospital (Chieng Mai, Medical School)
29. Sunpasit-Prasong Hospital, Ubol-Rajthani
30. Uttradit Hospital
31. Vachira Hospital, Phuket

Non-Government and Private Laboratories

Bangkok

1. Bangkok General Hospital
2. Bumrungras Hospital
3. Deja Hospital
4. National Blood Transfusion Centre, Thai Red Cross Society
5. Paolo Hospital
6. Phayathai Hospital
7. Thep-Tha-Rin Hospital
8. Siam Hospital
9. Smitivej Hospital
10. Vibhavadi Hospital
11. Immunodiagnostic Centre Laboratories
12. RIA Centre Laboratories
13. Special Laboratory
14. STD Clinics

Outside Bangkok

1. Ekchol Hospital (Cholburi)
2. Somdej-Na-Sriraja Hospital (Thai Red Cross)
3. Srikrim (Erawan) Hospital (Udorn-Thani)

Annex II

Distributors of Reagents for Anti-HIV Tests in Thailand.

1. Abbott (Thailand) Co., Ltd.
   Room 404, 604/3 Petchburi Road, Bangkok 10400
   Tel 251-6776
   Anti-HIV, ELISA (Abbott)
2. Anglo-Thai (Thailand) Co., Ltd.
   2160 Ramkhamhaeng Road, Hua Mark, Bangkok 10501
   Tel 374-0021, 374-8382
   Anti-HIV, HIV-Chek (Du Pont)
3. Clinical Diagnostic Co., Ltd.
   298/18-19 Pitsanuloke Dusit, Bangkok 10300
   Tel 281-2830, 282-7625, 281-9088, 281-4522
   Anti-HIV, ELISA (Biochrom)
4. Hoechst (Thai) Co., Ltd.
   302 Silom Road, Bangkok 10500
   Tel 233-2981-9
   Anti-HIV, ELISA (Behring)
5. Kyowa Hakko (Thailand) Co., Ltd.
   213/103 Patanakan Road, Moo 6, Praves, Prakanong, Bangkok 10250
   Tel. 321-1424, 301-6813
   Anti-HIV, PA (Fujirebio)
6. L. & R. Enterprise Co., Ltd.
   78/19 Rama 6 Road, Samseannai, Bangkok 10400
   Tel. 279-4864, 279-9621
   Anti-HIV, ELISA (Electro-nucleonics)
7. Organon (Thailand) Co., Ltd.
   1-7 Silom Road, Bangkok 10500
   Tel. 233-4827-8
   Anti-HIV, ELISA (Organon Teknika); Immunofluorescence (Organon Teknika)
8. Pacific Health Care (Thailand) Co., Ltd.
   229/1 South Sathorn Road, Yannawa, Bangkok 10120
   Tel 211-5142, 211-5151, 211-5158
   Anti-HIV, ELISA (Diagnostics Pasteur); Immunoblot (Diagnostics Pasteur)
9. Roche (Thailand) Co., Ltd.
   280 New Road, Bangkok 10100
   Tel 224-4442, 221-4173, 221-1121-5 ext 119, 120
   Anti-HIV, ELISA (Roche)

10. Siam Medico Supply Co., Ltd.
    136 Nares Road, Bangrak, Bangkok 10500
    Tel 234-3188,233-0151
    Anti-HIV, Immunoblot (Biorad)
11. US Summit (Oversea) Co., Ltd.
    197/1 Ninth Floor, Silom Road, Bangkok 10500
    Tel 235-5430-9
    Anti-HIV, ELISA (Diagnostic Biotechnology); Immunoblot (Diagnostic Biotechnology)
12. Wellcome (Thailand) Co., Ltd.
    64/1-4 Pan Road, Silom, Bangkok 10500
    Tel 236-0205, 236-9488-9
    Anti-HIV, ELISA (Wellcome)

Annex III

Evaluation of Two Screening Tests for Anti-HIV : ELISA versus Particle Agglutination

WHO Collaborating Centre on AIDS, Department of Microbiology, Faculty of Medicine Siriraj Hospital, Bangkok 10700, Thailand.

Human immunodeficiency virus (HIV) infections have been reported in America, Africa, Europe and Oceania and have recently been detected in Asia[1]. In Thailand, the HIV infection rate in homosexual males is 0-5%[2,3], in female prostitutes is 0.09%[3], and in selected blood donors from non-risk groups is 0%[2]. An explosive epidemic of HIV in intravenous drug users (IVDU) in Bangkok has been observed. The infection rate in IVDU increased from 0-1% in 1987[2,4] to 16-23% in the first six months of 1988[4,5]. Some IVDU gave a history of previous blood donation. All units of blood used in Bangkok have been screened for anti-HIV since October 1987[6].

ELISA test kits are commercially available and have been widely used for anti-HIV detection. However, there is considerable interest in simpler, more sensitive and more specific assays for use in laboratories in rural areas or for field studies. To serve this purpose, a gelatin particle agglutination test (PA) (Serodia-HIV, Fujirebio Inc., Japan) which is now available was tested and compared with ELISA tests.

A total of 637 serum samples were collected from 295 IVDU, 131 children with thalassemia, 7 children with haemophilia, 104 workers and 100 blood donors, between November 1987 and April 1988. The IVDU cases were from the Narcotic Treatment Clinic of Bangkok Metropolitan Administration, while the remaining individuals were from the Siriraj Hospital (Table 1). The samples were tested for anti-HIV by an ELISA (rapid ELAVIA) and by PA.

TABLE 1.

INFORMATION ON GROUPS TESTED FOR ANTI–HIV, BANGKOK, THAILAND.

Group	No. tested	Sex		Age	Place	Collection
		M	F	(av. ± SD)		period
IVDU	295	262	33	31 ± 6	Clinic BMA*	Jan 88 – Mar 88
Thalassemia	131	66	65	8 ± 4	Siriraj Hosp.	Dec 87 – Feb 88
Haemophila	7	6	1	6 ± 3	Siriraj Hosp.	Dec 87 – Apr 88
Workers	104	96	8	33 ± 6	Siriraj Hosp.	Nov 87 – Dec 87
Blood donors	100	65	35	25 ± 6	Siriraj Hosp.	Nov 87 – Dec 87

*BMA–Bangkok Metropolitan Administration.

Seventy-four serum samples were found to be anti-HIV positive by the ELISA and/or PA screening tests (Table 2). These sera were confirmed to be positive by Western Blot. The remaining sera were negative by both the ELISA and PA tests. All the positive sera were from IVDU.

TABLE 2.

PREVALENCE OF ANTI–HIV IN SELECTED POPULATIONS, BANGKOK, THAILAND, BY ELISA, PARTICLE AGGLUTINATION AND WESTERN BLOT.

Group	No. tested	No. anti–HIV positive (%)		
		ELISA*	Particle agglutination	Western Blot
IVDU	295	61 (20.68)	74 (25.08)	74 (25.08)
Thalassemia	131	0	0	0
Haemophila	7	0	0	0
Workers	104	0	0	0
Blood donors	100	0	0	0

*Rapid ELAVIA.

Thirteen samples were positive by PA but negative by ELISA. These samples were retested using different ELISA reagents. Two of the samples were found to be positive by the competitive ELISA's of Behring (F.R.G.) and Wellcome (U.K.) and by Abbott's second generation recombinant antigen. The ELISA test kit of Biochrom K.G. (F.R.G.) did not detect any positive samples.

In the IVDU group, the PA showed superior results in terms of sensitivity as well as specificity. The first generation ELISA (rapid ELAVIA) had a sensitivity of 82.43% when compared with PA, and the second generation recombinant antigen as well as competitive ELISA assays increased the sensitivity to 85.14%. Both PA and ELISA showed 100% specificity.

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