

MONITORING HUMAN IMMUNODEFICIENCY VIRAL INFECTION AND ACQUIRED IMMUNODEFICIENCY SYNDROME IN THAILAND

Vichai Poshyachinda and Vipra Danthamrongkul

The first acquired immunodeficiency syndrome (AIDS) case was identified in September 1984 (1). Up to 1987, a series of cross sectional serum screening survey targeting high risk groups, i.e. female and male prostitutes, intravenous injecting drug users (IDU) convicts and blood donors were conducted (2,3,4,5,6). Of these studies, the National Blood Bank survey from sampling blood donor in 1986 of samples from blood donors reveals 6 anti human immunodeficiency (antiHIV) seropositive cases from 4,495 cases, or 0.13% prevalence (7). The very low prevalence provided a significant warning on the wide spread danger to come from HIV infection. The first wave of rapid epidemic spread of the human immunodeficiency virus (HIV) infection actually started in the beginning of 1988.

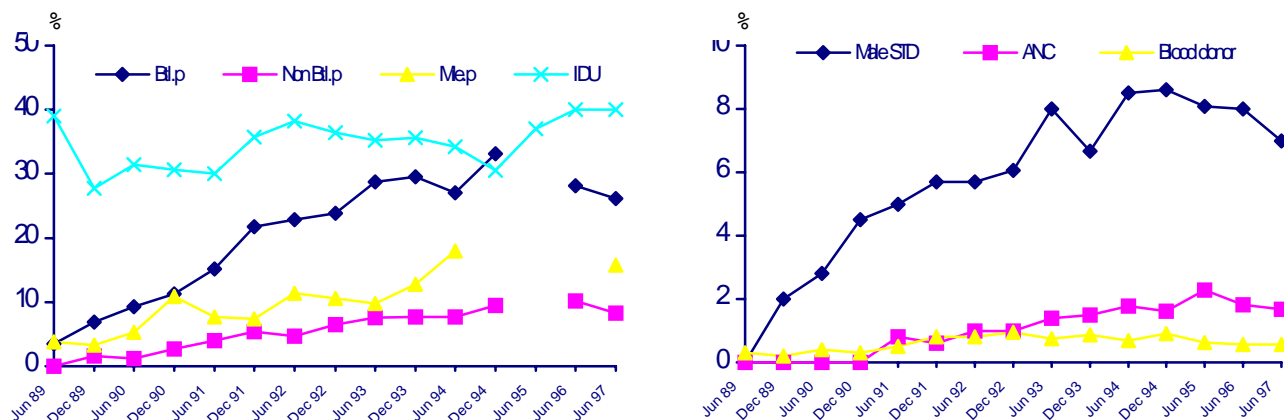
I. RESUME OF THE HIV EPIDEMIC

The IDU population was the first group to suffer from the nationwide rapid spread of HIV infection. The epidemic started in February 1988 and reached its peak in the same year (8,9). Similar rapid increase antiHIV seropositive prevalence among female prostitutes in the upper northern region followed almost simultaneously in the same year (8,9,10). Although the HIV epidemic started in the IDU population, the majority of the HIV infection in the country is through heterosexual transmission. The sexual promiscuity and the traditional patronization of prostitutes by the male population are most likely the prime behavioural causes of the epidemic. Between 1988 and 1990, the increase in antiHIV seropositive prevalence in 21-year-old military conscripts (11), male sexual transmitted diseases (STD) clinic clientele, antenatal care (ANC) clinic clientele (12) and blood donors (7) indicated that the HIV infection was spreading into the general population with different levels of prevalence in each specific sector. Most of the population that contracted the HIV infection by heterosexual transmission was commonly infected by the HIV-1 subtype E while the IDU population that contract the HIV infection by contaminated injection was generally infected by the HIV-1 subtype B (13,14,15).

The total cumulative number of HIV/AIDS cases in the registry up to December 1997 was 121,877 cases (16). These cases were distributed unevenly across the country. The highest range of 21-34 cases per 10,000 population was located in 3 provinces in the upper northern region and in a province in the eastern region. One province in the southern region harboured 19 cases per 10,000 population. All provinces in the northeastern region had the rate of between 0.6-4.6 cases per 10,000 (17). The trend of change in antiHIV seropositive prevalence from the sentinel serosurveillance demonstrated stable prevalence during the last 5 years in brothel and non-brothel based female prostitutes, IDUs, male STD clinic clientele and ANC clientele. However, male prostitutes exhibited a gradually increasing antiHIV seropositive prevalence through the monitoring period while the blood donor probably had a slightly decreasing trend from 1993 onwards (Figure 1). Notice should be made that the antiHIV seropositive prevalence level and time trend was widely different between the national aggregate, regional aggregate and the provincial sample as illustrated in the time trend of the antiHIV seropositive prevalence in brothel based prostitutes (Figure 2).

The HIV prevention program in Thailand adopts two main approaches, an intensive public campaign through various mass media and a variety of educative and behavioural modification interventions targetted on the high risk groups and the vulnerable sectors of the general population. The aims are to reduce the risk of HIV transmission from sexual promiscuity, unsafe sexual practices and the sharing of injecting paraphernalia. The strong and continuous promotion of safer sex through the Ministry of Public Health (MPH) 100% condom use program is among the largest national prevention program. The program was first piloted in November 1989 and implemented nationwide in 1992 (18). Many studies reported elsewhere demonstrate the dramatic increase in condom use and other indicators of the intervention effectiveness such as the rapid decrease in the incidence of STD and antiHIV seropositive prevalence among the general population in particular military conscripts (18,19,20).

Figure 1 AntiHIV seropositive prevalence, national aggregate, in brothel (Btl.p) and non brothel based (Non Btl.p) female prostitutes, male prostitutes (Mle.p), intravenous injecting drug users (IDU), male sexual transmitted diseases (STD) and antenatal care (ANC) clinic clientele and blood donors, Thailand : June 1989- June 1997



Source : Sentinel serosurveillance, Division of Epidemiology updated on October 31. 1997

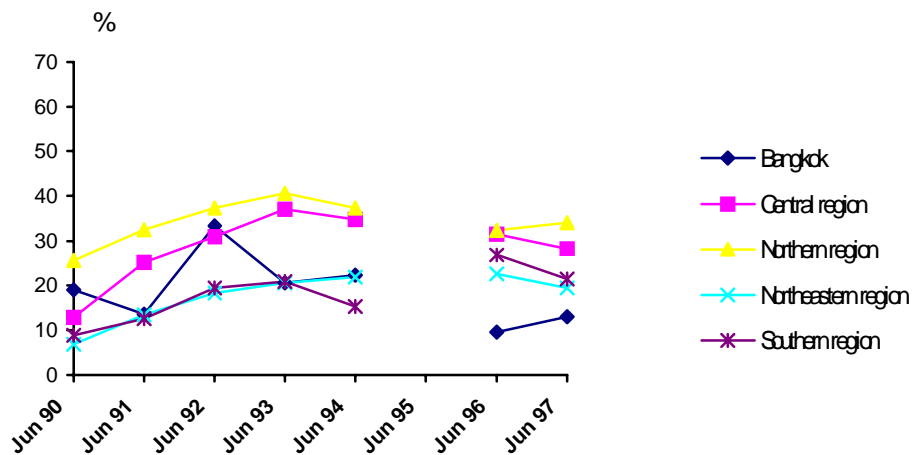
The limited reduction of risk from drug injecting and unsafe sexual practice in the IDU group had been reported since 1992 (21,22). Although the remarkable increase in condom use and the reduction of risk behaviour are encouraging indications of success, indications of many threats still remain clear. The persistent high antiHIV seropositive prevalence among the IDU population; the trend of steady increase in antiHIV seropositive prevalence in the non-brothel based prostitute population in the southern region including the male clientele of STD clinics (Figure 3); the recently demonstrated high antiHIV seropositive prevalence in fishermen in Songkhla Province in the southern region, 24.5% (23); the rapid and steady increase in antiHIV seropositive prevalence in new tuberculosis cases from 1.4% in 1989 to 12.1% in 1995 (24); and in relation to sexual behaviour; the fairly high sexual intercourse rate with casual partners among the military conscripts, about 54%, and factory workers, about 40% in concurrence with the low condom use rates of about 1/4 of the group (25), are perhaps adequate examples of the persisted contentions as yet to be overcome by future interventions.

II. HIV/AIDS MONITORING

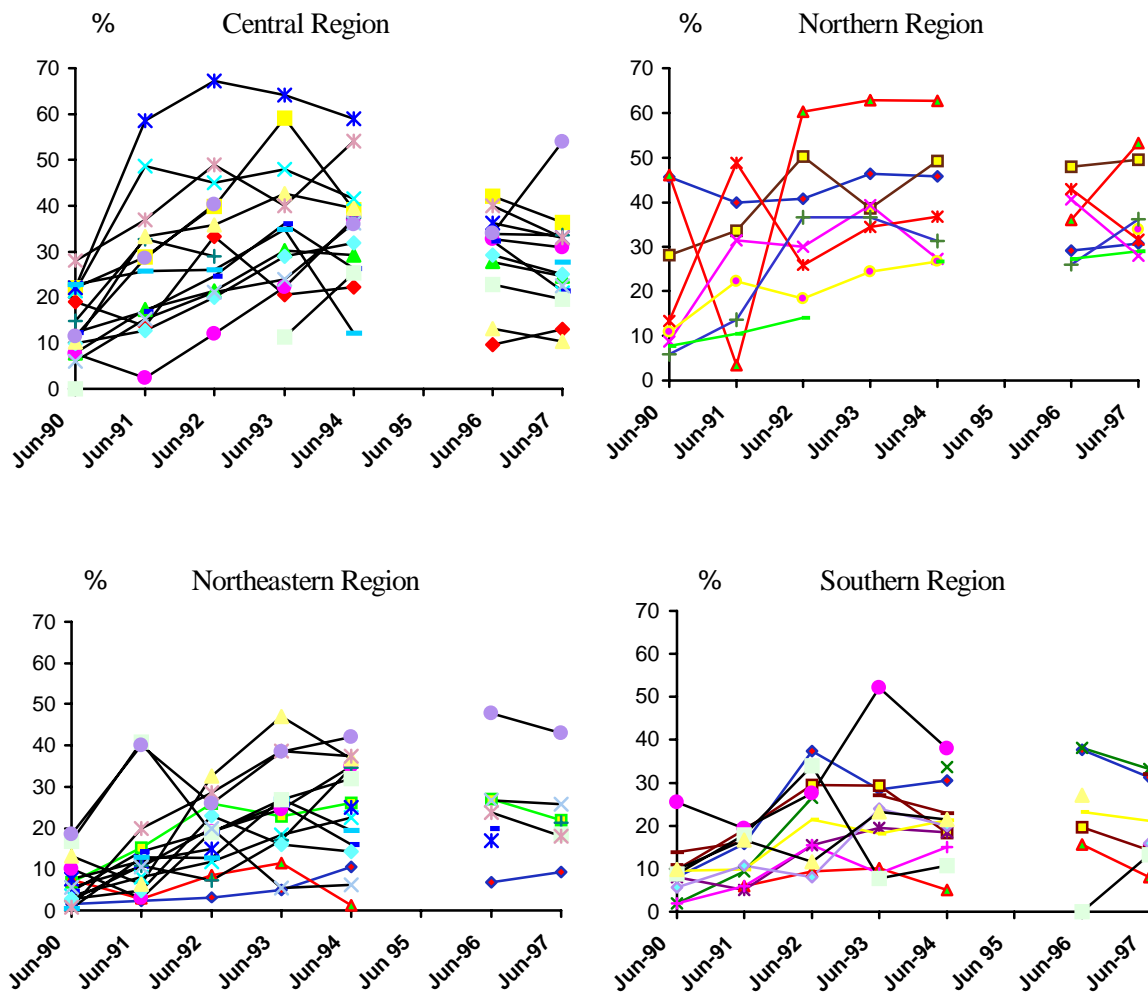
Most of the HIV/AIDS monitoring system was developed between the second half of 1987 and 1989. The target population covers a set of high risk group, the female and male prostitutes, the IDU, and sectors of the general population, STD and ANC clinic clientele, blood donors and military conscripts. Subsequently, monitoring of the other specific populations has been developed in recent years (Table 1). The HIV monitoring activities mentioned in the following presentation do not constitute the totality. Nevertheless, the series probably constitute the majority that contribute significantly to knowledge on the HIV epidemic. The information also impacts heavily on policy and strategy formulations to prevent and control HIV transmission. However, some examples of local monitoring are selected because of their relevancy in the evolution of the monitoring development and as an indication of the less tangible change in the awareness and concern of the group of agencies that have key roles in HIV intervention. HIV monitoring is presented in groups according to either their development relationship in a responsible agency, specific target group or type of study.

Figure 2 AntiHIV seropositive prevalence in brothel based female prostitutes : June 1990- June 1997

A. Regional antiHIV seropositive prevalence



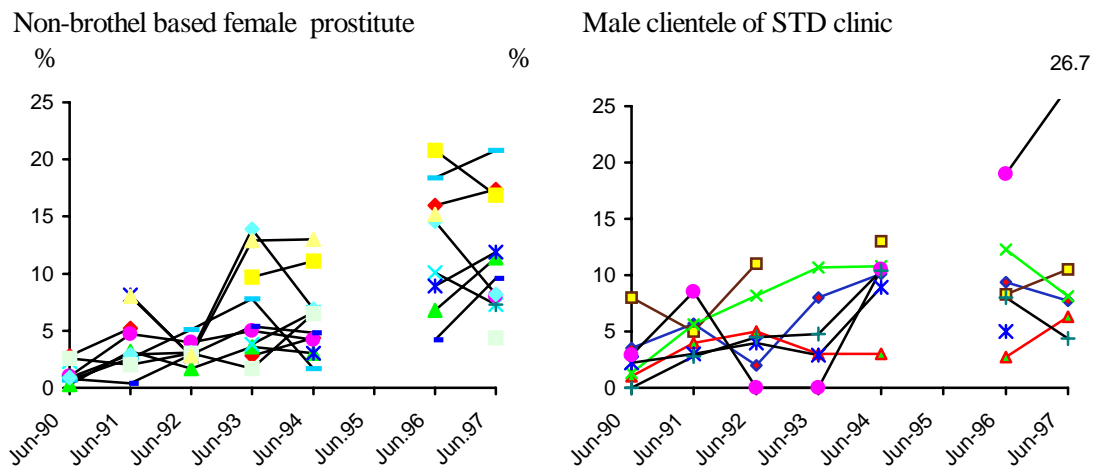
B. Provincial anti HIV seropositive prevalence



Note : each line represents reporting from one province

Source : Sentinel serosurveillance, Division of Epidemiology updated on October 31. 1997

Figure 3 Time series of provincial antiHIV seropositive prevalence of non-brothel based female prostitutes and male clientele of STD clinic in the southern region : June 1990-June 1997



Note : Each line represents reporting from one province

Source : Sentinel serosurveillance, Division of Epidemiology updated on October 31, 1997

II.1. The communicable disease registry and record system

The communicable disease registration and regular public health record of diseases under surveillance of the Department of Communicable Diseases Control (CDC) have a long standing management infrastructure and operative experience. The registration became the first HIV/AIDS monitoring system compiling HIV/AIDS cases and reports from all hospitals and medical service clinics around the country starting from the first AIDS case. The registry was established by the proclamation of a Public Health Regulation requiring notification of specific communicable diseases. The reporting form contains standard demographics and basic information related to the diagnosis, probable mode of HIV transmission determined from interview and brief case history. The first hundred cases were subjected to additional intensive retrospective epidemiologic case study conducted by the Division of Epidemiology, Office of the Permanent Secretary of Public Health (DE/MPH). The study yields great insight on the introduction of the HIV infection into the country while the registry itself provides epidemiological information on the early affected population.

The HIV/AIDS registry had definite advantages during the pre-epidemic phase because of the timely implementation. It was then the sole source of epidemiological information on AIDS and HIV infection cases. The registry required practically no basic investment and entails very low operational cost except for the diagnostic laboratory investigation. However, the recruitment is highly biased and does not sensitively reflect the current epidemic situation.

The Tuberculosis Division of the CDC established the record of antiHIV seropositive incidence among the new tuberculosis cases into the tuberculosis reporting system in 1989 and maintains the monitoring until the present. The statistical report of the Division reveals an alarming rapid increase in antiHIV seropositive incidence among the annual new tuberculosis cases already mentioned (24). The incidence of STD recorded by the Venereal Disease Division of the CDC has been commonly applied as a proxy of risk for HIV transmission via unsafe sex practice.

Based on the regular public health registry and reporting system, the CDC creates a set of relatively low cost HIV/AIDS monitoring useful for understanding the burden of the HIV/AIDS and an indication on sexual practices.

Table 1. The HIV/AIDS monitoring agencies, target population and variables included in the record.

Starting date	Implementing agency	Target group/area	HIV monitoring characteristics
Sep 1984	CDC/MPH	- HIV/AIDS cases/national	-HIV/AIDS Registry (continuous report)
Jan 1989	Tuberculosis Division	- TB infection cases/national	-serosurv.(continuous report)
Jun 1989	DE/MPH, PHO	Female-male prostitute prost., IDU, male STD, ANC clinic, blood donor, convict/national	-annual sentinel serosurv. (biannual Jun.1989-94)
Jul-Aug 1995	DE/MPH, PHO	Industrial worker, pregnant woman/national	-annual behavioural surv.
Jul-Aug 1996	The Royal Thai Army	Military conscript/national	
Jul-Aug 1997	Dpt.Gen.Ed.,PHO DE/MPH.	5 th grade secondary school student/national	
Jan 1987-91	Nat. Bl. Centre,	Blood donor/BKK and periphery	-continuous serum screening
Sep 1987	Thanyarak Hospital,	DU/IDUs patient /BKK suburb	-continuous serum screening
Jan 1988	Health Dpt./BMA	IDU patient / BKK	-continuous serum screening
Nov 1989	The Royal Thai Army	Military conscript./national	-biannual serosurv. behavioural surv.
Jul 1993	Payao PHO	Blood donor, ANC/northern region Prov.	-continuous serum screening, behavioural surv.
Sep 1989	Sanpatong Hospital	STD clinic,	-continuous serum screening
Nov 1990	Chiang Mai Province	Out-in patient/northern prov. district	-biannual antiHIV serosurv.
Jun 1997	Rayong Hospital	Foreign Labourer/eastern region prov.	-annual antiHIV serosurv.
Jun 1998	Songkhla PHO	Fisherman /southern region prov.	-annual anti HIV serosurv.

Abb :

BMA Bangkok Metropolitan Authority

CDC Department of Communicable Diseases Control

DE Division of Epidemiology,

Dpt. Gen. Ed. Department of General Education, Ministry of Education

Nat. Bl. Centre National blood Bank, the Thai Red Cross Society

PHO Provincial Health Office

MPH Ministry of Public Health

surv. Surveillance

serosurv. Serum screening surveillance

prov. Province

II.2. The sentinel serosurveillance and related monitoring

Through the exchange of ideas and experience in relation to the HIV/AIDS epidemic with World Health Organization (WHO) consultants and international experts, the MPH administrators and epidemiologists absorbed the idea of monitoring the HIV infection by the sentinel surveillance during the latter part of 1988. The DE/MPH realized the technical design of the HIV sentinel serosurveillance. The WHO supports the sentinel serosurveillance operation with computer facilities. The implementation of the first survey was partly supported by a European Community contribution in the form of orientation training for the implementing agencies. The monitoring collects the data and blood samples biannually in June and December. Approximately 100 cases from each of the 8 target groups, brothel and non-brothel based prostitutes, male prostitutes, the IDUs, the male clientele of STD clinic, pregnant women attending ANC clinics, blood donors and newly admitted prison inmates from each target area. The first sentinel survey target area included 14 provinces of 72 provinces. The data was collected in June 1989 (26). The

number of target provinces was increased to 31 in the second survey in December 1989. All provinces were included in the 3rd survey in June 1990 (27). The biannual survey was changed to once a year in June 1995 (28). Simple demographics and likely mode of HIV transmission are recorded together with the antiHIV serum testing result. The Provincial Health Office (PHO) is responsible for the collection of data and blood samples. The primary data is coded on computer disk and transferred to the DE/MPH for further data processing.

Realizing the need to monitor the status of sexual risk behaviour, the DE/MPH launched an annual behavioural sentinel surveillance in 1995. The aim is to monitor sexual behaviour in specific groups in the population. The first survey collected the data between July and August of 1995 from the industrial workers, pregnant women and military conscripts. The sample size for each target group was 350 people. The second survey in July-August 1996 added 5th grade secondary school students to the target group. The sample was collected from 19 provinces where the sentinel serosurveillance demonstrated relatively high antiHIV seropositive prevalence. The target area was expanded from 56 provinces to 76 provinces in the fourth survey in 1998 (29). Data on demographics, sexual experience, condom use and STD including treatment are collected by a simple anonymous self-report questionnaire. The PHO implements the survey for all target groups except the military conscripts where the Medical Department of the Royal Thai Army is the survey implementer. The behavioural sentinel surveillance implementers are mostly the same as in the HIV sentinel serosurveillance.

II.3. The specific target population monitoring system

The first serum screening for antiHIV seropositive monitoring was established in September 1987 by the National Blood Centre. The initiative was prompted by the result of the cross sectional survey in November 1986 mentioned earlier (7). The serum testing result had complementary data pertaining to the basic record of blood donation. The outcome of the monitoring in 1988 demonstrated the overall antiHIV seropositive prevalence of 6:10,000 from screening 217,373 blood units (30).

Thanyarak Hospital established an antiHIV serosurveillance of the IDU treatment population in September 1987. Thanyarak Hospital is a 350-bed residential drug dependence treatment centre located in Bangkok. The clientele come from all regions of the country. The annual service intake has ranged from about 8,000-13,000 cases over the last 5 years. The survey recruits all intake cases regardless of their previous experience on antiHIV serum testing but excludes case with prior anti HIV seropositive test. Additional demographics, drug use pattern, HIV transmission risk behaviour, treatment experience and basic biomedical data are also compiled. Apart from conducting HIV serosurveillance, the database of the Hospital has become one of the richest sources of material related to HIV infection in IDU population where many epidemiological studies have been made (31,32,33). Similar surveillance targeting on the hill tribes IDU population in the northern region has been conducted by the Northern Drug Dependence Treatment Centre of the DMS since 1989 (34). The Centre located in the suburbs of Chiangmai city.

The Health department of the Bangkok Metropolitan Authority (HD/BMA) started monitoring the IDU population in Bangkok in January 1988 by biannual cross sectional sampling IDU from their network of 17 Narcotic Clinics. Data collection is basically similar to those of Thanyarak Hospital (21). The monitoring contributes significantly to the understanding of the risk behaviour of drug injecting and sexual practices in the IDU population in Bangkok from the beginning of the HIV epidemic. However, the HD/BMA continued serosurveillance at the end of 1991. The HD/BMA still continue studying IDUs as a preparatory cohort for vaccine trial (35,36).

The Royal Thai Army started monitoring military conscript in November 1989. New military recruits are subjected to antiHIV serum screening in 2 rounds during May and November in line with the military recruitment system. The operation cost is partly supported by the bilateral funding from the U.S.Government executed through the long standing collaborative organizational infrastructure between military agencies. The monitoring collects interview information on demographics, sexual behaviour and STD in conjunction with the serum screening.

Since 1995, the MPH advocates the policy of monitoring special target groups in accordance with the situation of HIV infection, the need for problem solving and operational feasibility in the provincial area (28). The policy is widely distributed to all PHO. This is in line with the remarkable different situation of HIV/AIDS infection and AIDS in each province. Special population groups such as the fishermen in the eastern and southern regions, the illegal and legal immigrant population in many border areas (23,37) and the hill tribes in the northern region (34), all carry different patterns of HIV infection. They also have inherently diverse socio-economic backgrounds and live under different administrative and political references.

Generally, the local health agencies are well aware of the need to monitor HIV infection. Hence, the public health agency in some provinces actually started serosurveillance programs for specific target groups around 1996. The survey is designed and implemented by the local health agency from their own resources. The Rayong Hospital in the eastern region started monitoring antiHIV seropositive prevalence the foreign labourer population of 3 districts in 1997. The results show an increase from about 2-3 % in 1997 to 6% in 1998 (37). The Songkhla PHO in the southern region starts monitoring antiHIV seropositive prevalence in fishermen population the beginning of this year. The survey result is mentioned earlier. The PHO plans to continue monitoring in the following year. These surveys are examples of the recent local initiative in HIV monitoring.

II.4. Provincial Health Office and district hospital monitoring

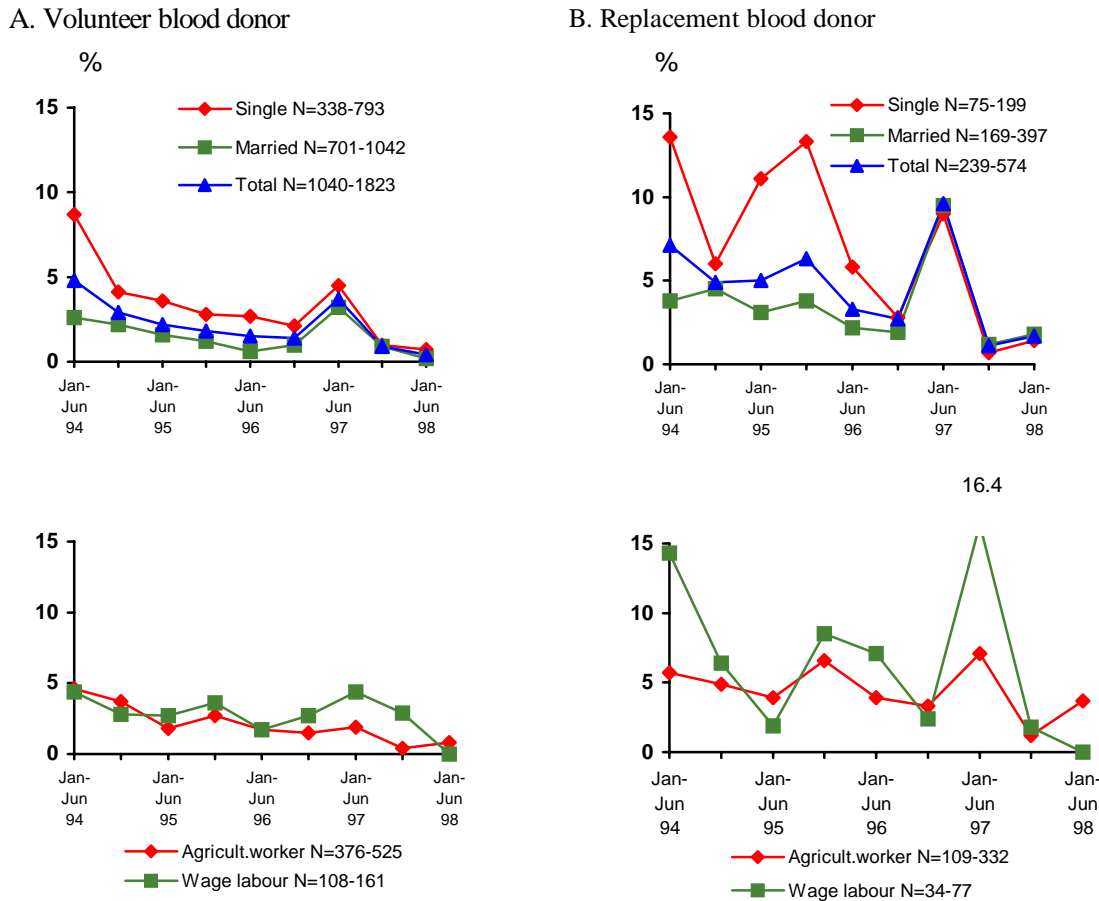
Since 1988, the PHO especially in provincial areas where HIV infection prevailed such as the upper northern region has been responsible for the intensive HIV/AIDS prevention, treatment and care program implementation. Part of the task is public communication and briefing the provincial administration and other government agencies. The reports from the HIV/AIDS registry and the sentinel serosurveillance are the common basic materials used in these communications. The high profile attention which the HIV/AIDS information received from the public administrators, non-governmental agencies, the mass media as well as the general public motivates some local health agencies to develop the HIV monitoring further. Some of these local initiatives generate more refined epidemiologic information with greater relevancy to local situations than the national or regional aggregate data from the central agencies. Examples of these local HIV/AIDS monitoring in the upper northern region are the AIDS Action Centre of Payao Province and the out-patient and in-patient HIV monitoring of the Sanpatong Hospital, a district hospital in the suburbs of Chiangmai city, Chiangmai Province.

The two agencies just mentioned are located in areas of high HIV prevalence and uniquely well known in their region as the locale of female prostitution. Payao Province has a district whose name "Dork Kham Tai" when used to describe a woman simply connotes a sexual permissiveness or promiscuity. While Sanpatong district has been widely known a few decades as the traditional red light district. The district has 38 sex service establishments and about 251 commercial sex workers in 1989 (38). The Payao Provincial Administration Office with the PHO recommendation established the AIDS Action Centre in 1993 to coordinate all matters related to HIV/AIDS intervention. Since then the Centre has been the organizational model advocated by the National AIDS Committee and the Ministry of Interior to other provinces. The Payao PHO is responsible for the operation of the Centre. The Centre compiles primary data on HIV/AIDS registration and sentinel serosurveillance including the HIV monitoring of pregnant mother attending ANC clinics and blood donors. The data collection on the latter two populations was further developed to include additional epidemiologic variables which enable detailed target population analysis. That the antiHIV seropositive prevalence among the volunteer and replacement blood donor is quite different, particularly when classified by marital status and occupation, is unique information from the Centre and highly relevant for local intervention planning (Figure 4).

Monitoring the antiHIV seropositive in the STD clinic clientele between September 1989 and August 1990, the Sanpatong Hospital demonstrated the high bimonthly prevalence among male clients, 8.8-27.6%; female clients, 1.1-8.8% and female prostitutes, 12.1-42.2% (38). Subsequently, the operation was developed to monitor out-patients and in-patients systematically. The monitoring was developed in collaboration with a university research team. The

monitoring has been in operation from 1990 to the present. The output is probably the only systematic and long-term hospital based information that demonstrates the as yet unabating HIV epidemic in a suburban area of a high HIV prevalence province (Figure 5).

Figure 4 AntiHIV seropositive prevalence of volunteer and replacement blood donor classified by marital status and occupation, Payao province, : Jan 1995-Jun.1997

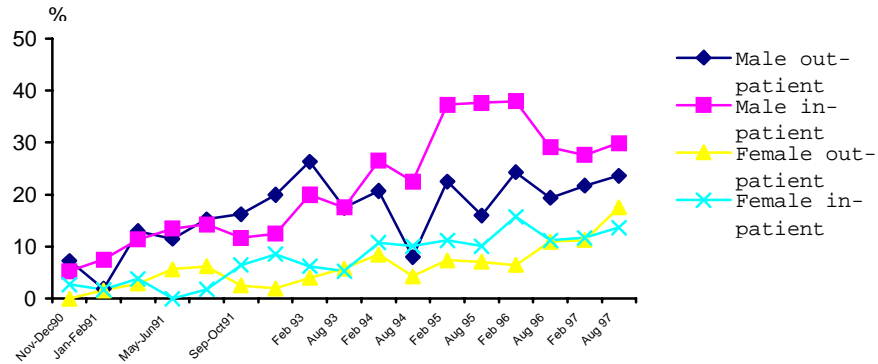


II.5. The cross sectional and cohort studies

From the beginning of the HIV epidemic to the present, a large number of health and academic professionals have carried out cross-sectional studies which yield extensive information on situations in specific populations and localities in relation to HIV prevalence, knowledge, attitude and risk behaviour etc. In fact, not less than 200 studies in this category had been reported in local and international publications between 1994-1996 (39). However, the integration of the results into a large area epidemiological pattern for a larger area is considerably constrained by the differences in target group characteristics, sampling criteria, study methodology and timing of the study. On the contrary, the small number of cohorts studied yield an important contribution complementary to HIV monitoring. Most cohort studies contain the essential concept of monitoring change over time specific to the target group and usually collect more extensive information than the regular HIV monitoring. At present, the target group of cohort studies are confined to female prostitutes (40), IDU (35,36) and the military conscript (41). They contribute unique results which have been referred to as evaluation indicators of the intervention impact evaluation as well (43).

Figure 5 Anti HIV seropositive prevalence in out and in-patients classified by sex of Sanpatong hospital, Chiangmai

province, northern region : Nov 1990-Aug 1997



III. DEVELOPMENT AND CONTRIBUTION

HIV monitoring is a composite function of multiple health agencies mostly under the MPH. Those that are outside of the MPH, i.e. the BMA and the Royal Thai Army, collaborate closely with the MPH. Overall, those responsible for the operation are the agencies that traditionally work with the target population of the HIV monitoring. The operation is therefore an extension of the agency function. However, the new task requires new developments in diagnostic capability and additional management of the input and output data and information. The sentinel surveillance is an exceptional monitoring tool that is completely new. The long term monitoring of multiple target groups widely distributed in the whole country requires a stable organizational infrastructure capable in administration and technical development. The DE/MPH was given the operational responsibility. The Division functions as a central data management and clearing house of the monitoring information and provides technical support to the network of PHO that implements the data collection and processing. The operation reflects another aspect of extending administration and co-ordination function of the formerly central public health technical agency which entails considerable reorganization of resources and function.

The establishment of the serum screening in the blood donor and the IDU populations demonstrates the sensitive concern and responsiveness of the service agencies. Their farsighted initiative is independent of the central administration of the MPH. The National Blood Centre actually started screening the blood unit on January 1987, about 2 months after finding the antiHIV seropositive blood donors in their first large survey (7). However, the serum screening was done only on request from the hospital which amount to about 50% of the total turnover number of the daily blood units. The development of the administration and laboratory capability to carry out the serum screening of total daily donated blood unit took time and investment. The establishment of total blood unit screening implemented in September 1987 is a credit to the efficient response of the agency. The serum screening of the IDU population of Thanyarak Hospital and the HD/BMA reflects similar concern and development effort. It is remarkable that these independent HIV monitoring initiatives provided the key evidence which demonstrated the HIV epidemic from the very beginning. The findings from the blood donor serum screening provides the reference point of the burden of HIV infection in the general population at the beginning of the epidemic. The more than 25-fold difference between the antiHIV seropositive prevalence of male and female blood donors then, underlined the significant influence of gender determinants (7).

The series of HIV/AIDS monitoring established during the first few years of the HIV epidemic mainly focused on the seroprevalence while the accompanying behavioural variables are simple data that are mostly applied in the classification of the target group. In the last few years, the HIV monitoring demonstrates two important directional changes, 1) the extension of the objectives toward behavioural monitoring and more diversified in the target group recruitment and 2) the increase in local area HIV monitoring. These directional changes have introduced better

understanding of the specific determinant of HIV transmission in well-defined populations. At the same time, the activity probably signifies the increased awareness and concern in the intervention among the local agencies. The change in subject recruitment frequency of the sentinel serosurveillance and the discontinuation of the HD/BMA monitoring of IDUs illustrate the adjustment of the HIV monitoring in response to the change in HIV/AIDS situation as well as cost saving concern (28).

HIV monitoring in Thailand is indeed a major undertaking that has no antecedent. The activity requires considerable long-term investment in manpower, funding organization and administration. The monitoring is continuously adjusting its objective and operation to fit the need of information and long term operational feasibility. So far the monitoring seems to yield timely information which is of relatively sensitive and reliable nature. The long-term sustainability and effectiveness evident, so far, depends to a large extent on the strength and flexibility of the public health infrastructure in conjunction with a strong collective commitment of the Administration and health professionals.

IV. LIMITATION AND CONTRAINT

The running of a large monitoring activity can hardly be trouble free. In the operation of the sentinel surveillance, the DE/MPH faces persistent irregularity in the population sampling and data collection uniquely pertained to HIV/AIDS. First of all the target population that belongs to the high-risk groups, i.e. female and male prostitutes and the IDUs are distributed irregularly in the country and are highly mobile. Therefore, the sampling location and recruitment number can hardly be controlled. The sample from the STD and ANC clinic clientele and blood donor population demonstrate sampling irregularity as well (Table 2). The statistics of the STD clinic clientele shows a gradual yearly decrease

Table 2 Ranges of reporting provinces and sample number of sentinel serosurveillance classified by geographical region: June 1990 - June 1997

Region	Target group.											
	Brothel female prost.		Non-brothel female prost.		IDUs		Male STD client		ANC client		Blood donor	
	Range	Range	Range	Range	Range	Range	Range	Range	Range	Range	Range	Range
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
	Prov.	Sample	Prov.	Sample	Prov.	Sample	Prov.	Sample	Prov.	Sample	Prov.	Sample
Bangkok	1	88-315	1	97-1204	1	200-1906	1	311-640	1	1212-4984	-	-
Central Region	13-24	1870-3586	16-23	2026-3676	19-24	772-1416	17-25	1005-2263	23-25	3181-24850	22-24	7560-16546
Northern Region	13-17	951-2304	9-13	917-1852	6-14	253-576	13-17	633-1819	16-17	2250-18725	16-17	7520-13038
Northeastern Region	9-18	718-1600	12-16	1150-1960	3-7	43-218	10-17	720-2128	15-19	1929-22171	16-19	8954-17183
Southern Region	7-14	884-2277	9-14	1549-2159	11-13	563-1020	7-14	471-1841	12-14	1952-7849	12-14	5583-8980

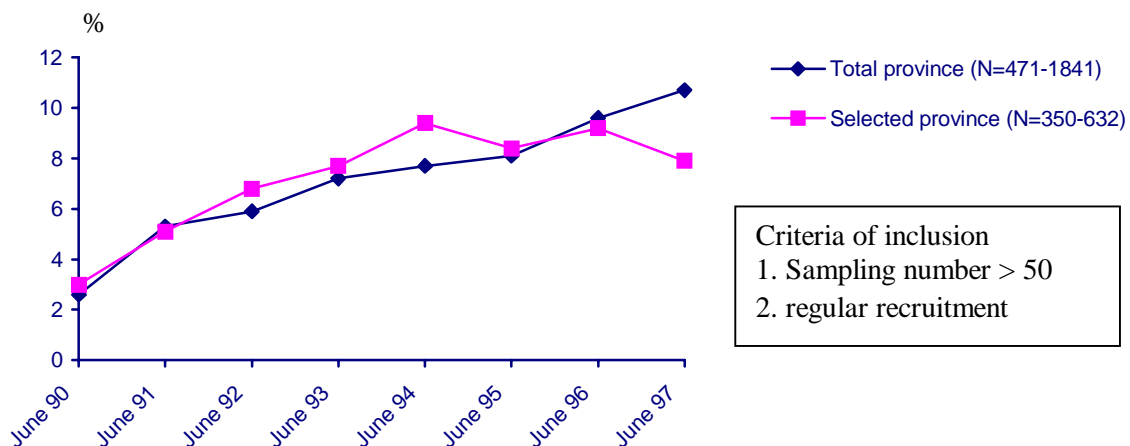
(42). The decrease in total population affects the recruitment number of each sampling site differently. The policy on testing pregnant mothers in order that the medical prevention of the vertical transmission can be effectively

implemented has increased the recruitment number from ANC remarkably in the last few year. The examples demonstrate at least three sets of factors, 1) the population characteristics, 2) change in health service demand and 3) health policy that strongly influences the sample recruitment and limit the comparability of the results over time.

The HIV/AIDS registry which had been quite informative in the early years of the epidemic has in recent years suffered considerably from severe under reporting, inaccurate diagnoses and data processing errors. The series of studies reviewing the HIV/AIDS reporting of Phayao province revealed management inefficiency and technical insufficiency of the reporting hospitals (44,45,46,47). The deterioration in quality of the registry input compromise considerably the usefulness of the output.

The DE/MPH reports the statistical output from the HIV/AIDS registry and the sentinel serosurveillance regularly in the Weekly Epidemiological Surveillance Reports from the beginning of the epidemic to the present. The reports present percentage, point prevalence and time trend by basic demographics, sex, age, occupation, risk behaviour variables and geographical area. This information is without doubt highly useful for policy formulation and strategic planning. However, they hardly exhaust the potential of epidemiological data processing. In particular, the sampling bias can be controlled by specific data processing approaches such as setting the exclusion criteria on minimum numbers of samples in each sampling area and the regularity of recruitment over time. The process allows for a better timeline comparability between various demographic subsets within specific geographical areas. For example, different trends of change during the 1990s in antiHIV seropositive prevalence of the male STD clinic clientele of the southern region can be demonstrated between the two different approaches of data processing already stated (Figure 6). The finding raises a caution in the interpretation of the sentinel surveillance output that deserves elucidation from further study.

Figure 6. AntiHIV seropositive prevalence among male clientele of STD clinic from all reported province and selected province according to specific criteria of inclusion: southern region, June 1990-June 1997



V. OUTPUT UTILIZATION AND IMPACT ON POLICY AND STRATEGY

Since the HIV monitoring is mainly a MPH operation, there is little need for any elaborate process to transfer the output to the policy making body in the MPH. However, the independent monitoring output from each agency lacks a centralized data management and clearing house. For interested parties outside the MPH that do not have close collaboration, access to the main bulk of the monitoring output is a daunting process of contacting individual source agencies.

The early detection of the epidemic allowed for immediate public campaigns and direct communication with policy makers on the situation and the danger of HIV/AIDS with genuine statistics and factual descriptive information. The

contribution of the HIV monitoring information in the policy and target formulation of other decision making in relation to the intervention program cannot be easily defined. Many types of information from multiple sources are continuously interacting with the public and the governmental bodies. For example, a case of HIV infection from blood transfusion during a surgery in November 1986 (48) created repeated nationwide publicity through all mass media communications until 1991 when he died (49). The case inspired a sustained and deep interest in the public and the government. Issues on HIV transmission routes, preventive measures, disease progress, treatment, welfare security and ethics, etc. are widely debated in relation to the case. The input from the professional, academic and non-governmental agencies including the social and political environment probably has some influences on the policy and decision as well. Nevertheless in 1990, the Director of the CDC reported extensive application of the output from the HIV/AIDS registry and the first sentinel surveillance result in the formulation of the HIV/AIDS intervention strategy (50). Furthermore, the HIV monitoring output is consistently used by all parties concerned with the intervention and public communication.

The chronology of the monitoring output and the landmark events in the HIV/AIDS policy and strategy formulation is illustrated in Figure 7. The chronological sequence demonstrates the timely interaction between the two components. The first AIDS case (1984), the cross-sectional surveys (1985-1987) and the case of HIV infection from the hospital blood transfusion (1986) pre-date the institution of the immigration control of foreign persons with AIDS and HIV infection from entering the country (1986), the establishment of the National AIDS Prevention Project, the establishment of antiHIV serum testing in all regional and major hospitals (1987) and the formulation of the first medium-term plan 1988-1991. The demonstration of the beginning of the HIV epidemic from serum screening of blood donor and IDUs (1987,1988) precedes the upgrading of the AIDS Prevention Project to the Centre for Prevention and Control of AIDS in the CDC, chaired by the Permanent Secretary of Public Health (1988). The sentinel serosurveillance demonstration of the prevalence in the risk groups as well as the general population sectors (mid 1988) predates the establishment of the National Committee on AIDS Prevention and Control, chaired by the Minister of Public Health (1990) and the Prime Minister declaration of national priority and the first National Plan on HIV/AIDS (1991). The detailed study that demonstrates the significant correlation between the HIV/AIDS monitoring and the policy on HIV/AIDS in Thailand has been reported elsewhere (51).

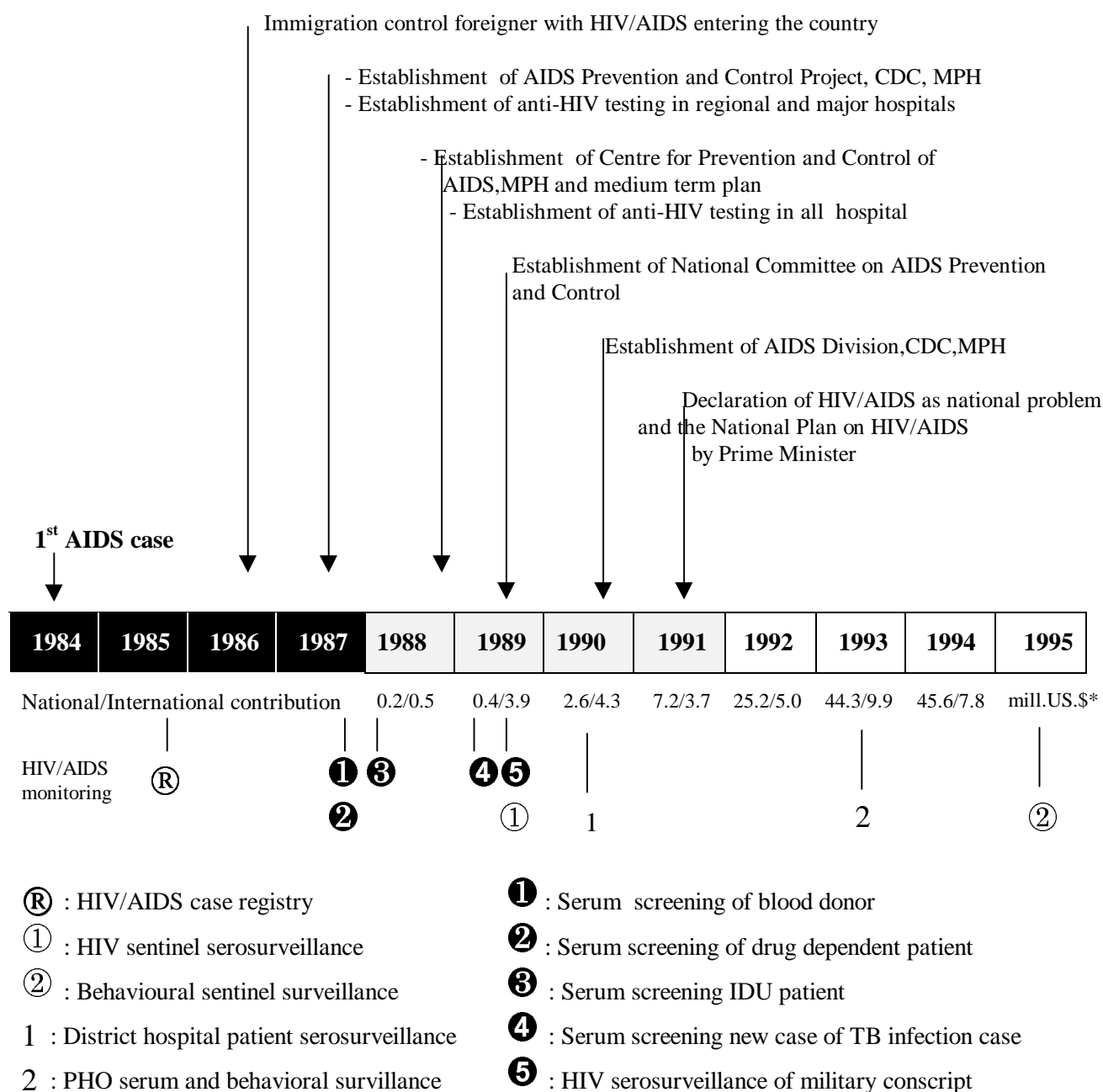
The development of HIV monitoring in the last few years at the provincial level most likely reflects the increased awareness and concern on HIV/AIDS of the local administration and health agency. They therefore represent an important impact from the knowledge on the HIV/AIDS situation and the HIV monitoring output. Simultaneously, the knowledge probably has impact on the local policy and strategy formulation as well.

VI. TOWARDS THE FUTURE

HIV/AIDS will continue to be a major life threatening burden for developing countries for many more years. Many countries at present have to deal with the beginning of the endemic phase of HIV infection. Many more still have to contend with the localized epidemic in specific population sectors in a confined area. At this stage, the prevention of HIV infection probably has to deal with more area specific situations. The balance between macro and micro area monitoring will be of increasing concern.

The heterogeneous distribution of HIV prevalence in Thailand is probably not unique. Since the differences in culture, socio-economic status and public administration etc. that influence the pattern of HIV transmission is common in many countries, area specific monitoring and well-focused intervention is critical in the control of HIV infection. The unabated HIV epidemic in non-brothel based prostitutes, IDUs and the fishermen population including the endemic cases of tuberculosis, etc. reflect the current specific situation that requires close attention in Thailand. Deeper understanding of the specific determinants of HIV transmission in these populations may not be altogether the terms of reference of the HIV monitoring. Yet to some extent, the current monitoring can be further developed to comprehensively cover the vulnerable sector of the general population.

Figure 7. Chronology of monitoring establishment and landmark events in HIV/AIDS policy and strategy formulation



*Source : Porapakham Y., Pramanpol S. and Adibodi S. : HIV/AIDS Policy : case studies in Thailand 1984-1994, Asean Institute for Health Development, Mahidol University, Sep. 1995.

The monitoring design and operation can be refined to improve completeness, sensitivity, reliability and timeliness in response to local need. Towards this end, local resources, technical capability and utilization of HIV monitoring output have to be examined and developed with care aiming at the optimal effectiveness. In the foreseeable future,

HIV monitoring will need a revision in accordance with the change in situation of HIV infection to maintain their output relevancy and effectiveness. In other words, HIV monitoring cannot be a static undertaking but has to continue evolving in response to the dynamic of HIV infection.

CONCLUSION

The identification of the first AIDS case in Thailand posed the first challenge to monitor the spread of HIV infection. The research results from the academic and health professional groups and the HIV/AIDS registry output serve as a warning that inspired the establishment of serum screening of blood donors and IDUs. The serum screening of specific target group timely demonstrates the HIV epidemic among IDUs and female prostitutes. The dramatic pattern of nationwide rapid spread of HIV infection in turn stimulates the cyclic chain of interaction between the policy and strategy formulation and the continued development of HIV/AIDS monitoring.

HIV monitoring is a composite function of many health agencies mostly under the MPH. The monitoring includes the high-risk groups as well as sectors of the general population. The development of the monitoring relies upon extending the function of responsible agencies. The development entails considerable reorganization of infrastructure, resources investment and establishing new technology. Despite the flaws in HIV monitoring, the output apparently provided highly significant knowledge and information critical to the formulation of policy and strategy for HIV/AIDS intervention and expedites the implementation of the intervention. The final impact of success in preventing the country from the imminent devastation of HIV infection is indeed deeply gratifying. However, the threat is far from over. To maintain the effectiveness of HIV monitoring in the future, continuous revision in accordance with the change in the HIV epidemic is essential.

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