REVIEW: COLLECTED MATERIALS AND RECORDS OF HIV/AIDS PREVALENCE AND THE CONTEMPORARY SOCIAL CHANGES IN THAILAND

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Abbreviations: HIV, human immunodeficiency virus; AIDS, acquired
immunodeficiency syndrome; ARC, AIDS-related complex; TB, tuberculosis;
STD, sexually transmitted diseases; WHO, World Health Organization; MOPH,
Ministry of Public Health of Thai Government; DMS, Department of Medical
Sciences, NIH, National Institute of Health; CDC, Communicable Disease
Control; IDU, injecting drug users; CSW, commercial sex workers.
INTRODUCTION

It is well recognized that the epidemiology of HIV/AIDS is closely associated with human behaviors, moral standards in the society, view of life, sense of value, the family system, population migration, social changes due to economical development, and other miscellaneous factors of culture and civilization. This is particularly true with the case of Thailand.

This article is to present the collected materials and records which may provide the information necessary to think about those matters. In Thailand, the spread of HIV/AIDS and the socioeconomical development have been going on concomitantly for the past 10 years. Because of the complex nature, however, it is not always easy to analyze the problems whether this concomitancy is causally associated, or simply a correlation, still or only a coincidence.

Therefore, the present authors will not go into the detailed analysis of the association mechanism between the epidemiology and sociology in HIV/AIDS prevalence. Nevertheless, we think that the collected materials may serve to the understanding of the whole picture of the HIV/AIDS problem in Thailand and suggest the social factors apparently connected with the epidemiology. With this idea in mind, we dared to attempt the literary survey of increasing HIV/AIDS prevalence together with the contemporary social changes.

Prelude of HIV / AIDS epidemic in Thailand (Fig. 1)

The first case of full-blown AIDS in Thailand was an imported one, a bisexual Thai male of 28 years old who returned from the United States. He spent 2 years there, and died by the end of 1984. This alarming event prompted public health authorities and medical society to serological survey in high risk groups. At the end of the same year, the second case was reported, a homosexual foreigner who returned home country after a short stay in Thailand. In 1985, four more cases were reported, three of them being foreigners who had already been infected before coming to Thailand. The remaining one was a 27-year-old bisexual Thai male. He had contracted with a German who visited Thailand every 2 to 3 months. The patient's female partner was also infected with HIV and diagnosed as ARC (1,2). In 1987, six more AIDS cases were reported, most of them being homosexual Thai males infected abroad. In 1988, two heterosexual female AIDS cases were reported; one had received blood transfusion in a Middle East Country and the other was born from an HIV-seropositive parent (3).
Fig. 1. History of AIDS topics in Thailand.

AIDS discovery in risk groups

Prevalence among IDU groups

Spread to the general public

Male citizens

House wives

Infants

Serosurveillance by research groups in universities, governmental and nongovernmental organizations

Sentinel serosurveillance by the Ministry of Public Health

National AIDS Committee for AIDS Prevention and Control Programme

1ST 2ND 3RD

REORGANIZATION
After these sporadic cases, an explosive outbreak of HIV-infection was detected by serosurvey among heroin and opiate users admitted to Thanyarak Hospital for treatment of drug addition and also through serosurvey by the Metropolitan Administration Department of Bangkok (4,5).

Coming into 1989, the sentinel serosurveillance revealed a dense distribution of HIV-positivities (around 40%) among brothel prostitutes in the northern part of Thailand. Since then, HIV began to spread into the general population with increasing rapidity. In Thailand, motorcycle accidents and AIDS are now the top causes of deaths.

During the period from 1984 to 1989, AIDS case finding and serological survey for the prevalence of HIV-infection were carried out mainly by voluntary activities of medical colleges, blood centers, and local health authorities in high risk groups or in selected resort places rather than by the nation-wide Governmental system. The Thai Government had to place more weight to the enforcement of the "International Tourism Year Project" at that time.

Donated blood screening for HIV was started in 1986 at the National Blood Center of the Thai Red Cross Society. Siriraj Hospital and Ramathibodi Hospital in Mahidol University were also coming into the pioneering activity for surveillance for HIV/AIDS and established a routine screening system for every unit of blood donors on September 1, 1987.

Chulalongkon University Hospital had an experience to diagnose the first case of AIDS in February 1985, and then the total 14 full-blown AIDS cases have been recorded up to February 1989. The hospital set up the inpatient facility for AIDS first in Thailand.

Chiang Mai University was another center of HIV/AIDS study because of the well-trained staffs and nicely-equipped facilities in the Department of Microbiology, Faculty of Medicine. Chiang Mai Province has been the most prevalent area of HIV/AIDS in this country. In 1986, the survey system by ELISA and the Western Blot test was already introduced here.

Government statistics of the present status of HIV/AIDS

There are two major sources for Government statistics on HIV infection and AIDS; the AIDS/ARC voluntary reporting system and the semi-annual sentinel serosurveillance system. In the former system, health institutions and physicians are encouraged to report the AIDS/ARC cases to public health authorities. As in most countries, under-reporting of AIDS/ARC cases remains problematic.
This system is to be improved in future together with a new case definition for AIDS diagnosis. The latter system started in June, 1989 for a cross-sentinel HIV serosurvey among selected population groups to be carried out twice a year in June and December. Since the third survey, all 73 provinces including Bangkok have been covered to grasp the extent of HIV infection in the whole country. The population groups subjected to the survey are now six. The Division of Epidemiology of MOPH is responsible for the data-collection, statistics, and publication (6). The epidemiological information thus obtained is used to estimate the HIV/AIDS situation among the general population and the future extent of the epidemic, and to serve the national planning for prevention and control of the disease. The update of the HIV/AIDS situation in Thailand is shown in the tables as below.

The total number of AIDS/ARC cases was 6,122 in September, 1993 (Table I). Sexual intercourse accounted for 74.6% as risk behavior of AIDS cases, while IDU accounted for 8.5% (Table II). The cumulative total number of AIDS cases increased upto 7,457 in May 31, 1994, more than 2,000 of whom have already...
Table I. Number of reported AIDS/ARC cases in Thailand by year of diagnosis, 1984-1993 (as of September 30, 1993)

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</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>5</td>
<td>29</td>
<td>74</td>
<td>424</td>
<td>1276</td>
<td>1615</td>
<td>3432</td>
</tr>
<tr>
<td>ARC</td>
<td>0</td>
<td>5</td>
<td>8</td>
<td>13</td>
<td>23</td>
<td>100</td>
<td>223</td>
<td>408</td>
<td>1175</td>
<td>735</td>
<td>2690</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td>20</td>
<td>28</td>
<td>129</td>
<td>297</td>
<td>832</td>
<td>2451</td>
<td>2350</td>
<td>6122</td>
</tr>
</tbody>
</table>

Source: Department of Epidemiology, MOPH.

Table III. Geographical distribution of AIDS cases (as of February 28, 1994)

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central (25 provinces)</td>
<td>1,413</td>
</tr>
<tr>
<td>Bangkok</td>
<td>595</td>
</tr>
<tr>
<td>Other central provinces</td>
<td>818</td>
</tr>
<tr>
<td>Northern (17 provinces)</td>
<td>2,994</td>
</tr>
<tr>
<td>Northeastern (19 provinces)</td>
<td>576</td>
</tr>
<tr>
<td>Southern (17 provinces)</td>
<td>232</td>
</tr>
<tr>
<td>Total</td>
<td>5,215</td>
</tr>
</tbody>
</table>

Source: Division of Epidemiology, MOPH.

died by this time (AIDS Newsletter, May 31, 1994). Figure 2 indicates that the majority of AIDS cases are in the age range from 20 to 44. The incidence rate at age 0 to 4 is around 10% but 0 at age 5 to 9, indicating the fatal outcome of AIDS in newborn babies sooner or later. More than half of AIDS cases have been
Table II. Number of reported AIDS cases in Thailand by sex, risk behavior, and year (as of May 31, 1994)

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<tr>
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</thead>
<tbody>
<tr>
<td>1. Sex related</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Homosexual male</td>
<td>8</td>
<td>10</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>17</td>
<td>3</td>
<td>49</td>
<td>0.66</td>
</tr>
<tr>
<td>- Bisexual male</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>17</td>
<td>0.23</td>
</tr>
<tr>
<td>- Heterosexual male</td>
<td>3</td>
<td>11</td>
<td>37</td>
<td>291</td>
<td>955</td>
<td>3,164</td>
<td>458</td>
<td>4,919</td>
<td>65.96</td>
</tr>
<tr>
<td>- Heterosexual female</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>25</td>
<td>105</td>
<td>441</td>
<td>62</td>
<td>640</td>
<td>8.58</td>
</tr>
<tr>
<td>2. I D U</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>1</td>
<td>4</td>
<td>20</td>
<td>33</td>
<td>124</td>
<td>368</td>
<td>26</td>
<td>576</td>
<td>7.72</td>
</tr>
<tr>
<td>- Female</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td>14</td>
<td>0.19</td>
</tr>
<tr>
<td>3. Blood transmission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>23</td>
<td>0.31</td>
</tr>
<tr>
<td>- Female</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>17</td>
<td>0.23</td>
</tr>
<tr>
<td>4. Vertical transmission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>65</td>
<td>119</td>
<td>352</td>
<td>34</td>
<td>586</td>
<td>7.86</td>
</tr>
<tr>
<td>- Female</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>33</td>
<td>58</td>
<td>201</td>
<td>16</td>
<td>316</td>
<td>4.24</td>
</tr>
<tr>
<td>5. Unidentified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>32</td>
<td>61</td>
<td>151</td>
<td>18</td>
<td>270</td>
<td>3.62</td>
</tr>
<tr>
<td>- Female</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>52</td>
<td>8</td>
<td>65</td>
<td>0.87</td>
</tr>
</tbody>
</table>

| Total                        | 16      | 33   | 83   | 436  | 1,385| 4,876| 628  | 7,457 | 100.00|

Source: CDC, MOPH.
Fig. 3. HIV serosurveillance among blood donors in the HIV antigen study (June, 1992-July, 1993) and in the sentinel survey (June, 1993), Thailand. Survey (June, 1992), Thailand (Date Source: Division of Epidemiology, MOPH).

Table IV shows HIV seropositive rates as detected among high risk groups by semi-annual sentinel serosurvey during the period from June, 1989 to June, 1993. The rate among IDU has been found rather stable (35.2%). Trend of rapid increase of the positivity is particularly remarkable in brothel sex workers (3.5% to 28.51%), high-class sex workers (0% to 7.51%), and male STD (0% to 8%).
<table>
<thead>
<tr>
<th>Risk groups</th>
<th>Jun'89</th>
<th>Dec'89</th>
<th>Jun'90</th>
<th>Dec'90</th>
<th>Jun'91</th>
<th>Dec'91</th>
<th>Jun'92</th>
<th>Dec'92</th>
<th>Jun'93</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDU</td>
<td>39.00</td>
<td>27.75</td>
<td>31.36</td>
<td>30.00</td>
<td>30.00</td>
<td>35.69</td>
<td>38.24</td>
<td>36.39</td>
<td>35.21</td>
</tr>
<tr>
<td>High-class sex worker</td>
<td>0.00</td>
<td>1.62</td>
<td>1.26</td>
<td>2.64</td>
<td>3.95</td>
<td>5.10</td>
<td>4.73</td>
<td>6.46</td>
<td>7.58</td>
</tr>
<tr>
<td>Male STD</td>
<td>0.00</td>
<td>2.00</td>
<td>2.82</td>
<td>4.47</td>
<td>5.05</td>
<td>5.67</td>
<td>5.71</td>
<td>6.06</td>
<td>8.00</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.81</td>
<td>0.63</td>
<td>1.00</td>
<td>1.00</td>
<td>1.39</td>
</tr>
<tr>
<td>Blood donor</td>
<td>0.28</td>
<td>0.25</td>
<td>0.41</td>
<td>0.36</td>
<td>0.46</td>
<td>0.79</td>
<td>0.80</td>
<td>0.95</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Source: Department of Epidemiology, MOPH.
In 1992, two HIV-2-infected IDU were reported in Sanutprakan province. In 1993, two more cases of co-infection with HIV-1 and HIV-2 were reported among prostitutes in Saraburi province.

Data to estimate the extent of HIV-infection prevalence in the general population would be obtained by serosurvey of donated blood samples screened for negative HIV antibody. Figure 3 shows the results of the survey carried out in 15 hospital laboratories in Thailand during the period from June, 1992 to July, 1993 together with those of the sentinel survey conducted in June, 1993.

A total of 73,292 blood samples were screened for HIV antibody and HIV-p24 antigen in 15 laboratories. All reactive specimens for either HIV antibody or the antigen were confirmed by supplementary tests at NIH, Thailand. The prevalence rates of HIV-seropositives (antigen study) ranged from 0.7 to 5.8% in the north, 0.8% to 2.1% in the south, 3.7% in the east, and 0.6% in Bangkok. The data from the sentinel survey are almost parallel to the above results.

For quality assurance of the working laboratories, 5% of donated blood samples which had been nonreactive to either HIV antibody or HIV-p24 antigen in the screening were randomly collected and selected to retest by ELISA at NIH. Out of 3,564 samples, 10 (0.28%) were HIV-seropositive. From this observation, the risk of HIV transmission by blood transfusion must still be taken into consideration in Thailand.

At any rate, the number of known and reported cases of HIV infection reflects only "the tip of the iceberg". A working group comprising representatives from MOPH, other Government organization and private sectors have been working together for estimation of the total number of HIV-infections on the basis of sentinel surveillance data. The group suggested that approximately 200,000 persons were infected with HIV in the late 1990, 350,000 to 500,000 at the end of 1992, and 600,000 at the present time, 1994. The epidemiological information as stated in this section was obtained from "AIDS Newsletter" published periodically by the Division of AIDS, the Department of Communicable Disease Control, the Ministry of Public Health. The most recent issue available is of May 31, 1994.

Development of Government organization for AIDS prevention and control

In view of the world-wide AIDS prevalence, MOPH announced in 1985 to include AIDS into the list of notifiable diseases under the Communicable Disease Act, and established the National Advisory Committee on AIDS comprising responsible health administrators, lawyers, and technical experts. The
responsibility of this committee was to coordinate and cooperate among institutions concerned in the prevention and control of AIDS, to give advice on the research intervention for the problems, and to appoint the ad hoc committee to study on any specific issues. The committee was enlarged and revised twice later (1987, 1988) to include more governmental authorities and agencies and to work closer together. It was consisting of six committees. Meanwhile, the Medical Branch of the National Research Council took up AIDS problems as a priority area of study. In December, 1986, an intercountry consultative meeting was held in WHO-SEAR in New Delhi to counteract against the AIDS situation in South East Asian Region. In this meeting, the Department of Microbiology, Faculty of Medicine, Siriraj Hospital, Mahidol University was designated as one of the 27 WHO centers around the world.

The National Advisory Committee of AIDS was reorganized in 1991 into the National AIDS Prevention and Control Committee having the Prime Minister as chairman and the enlarged committee members. The responsibilities of the committee were defined as below:

- Making policies in AIDS prevention and control to suit with the situation and problems.
- Monitor AIDS prevention and control activities of various governmental and nongovernmental agencies.
- Promote and support activities of various agencies to meet the objectives and targets relevant to the policies made.
- Coordinate and solve problems and constraints in AIDS prevention and control of governmental and nongovernmental agencies.
- Establish subcommittees as required.

Because of the changing situation of HIV/AIDS prevalence and of the social and cultural aspects of the disease, the committee has been discussing and amending the national plan and strategy of anti-AIDS program. One example is the active discussion held in a recent meeting (Feb. 14, 1994) concerning the draft of the 1995-1996 Action Plan on AIDS Prevention and Control. A controversial point in the plan is that the issue concerning protection of human rights from blood testing contradicts another issue of the draft emphasizing the collection of statistics for evaluation of the current situation of HIV/AIDS prevalence. In this regard, routine serosurvey for searching new cases of HIV infection is not always encouraged in Thailand. Apart from this problem, the draft of the 1995-1996 Action Plan is stating the following items as the anti-AIDS principles and strategies (7,8).
To provide accurate medical and social treatment to HIV/AIDS carriers and those affected by disease.

To encourage living with HIV/AIDS carriers, without depriving them of equal rights in society.

The action plan consists of six working schemes.

- Prevention through behavioral change and social attitude.
- Provision of health insurance and medical treatment.
- Increased provision of counseling.
- Encouraging research work and management development.
- To increase awareness among people that AIDS is a “near” problem and to make them understand and have pity on AIDS patients.
- To develop campaigns in prevention and control to cope with various risk groups in society.

Health care costs for AIDS prevention and control is a big problem in any country. According to WHO (Dr. Merson), the health care cost per person with AIDS in Thailand was between $615 and $1,000 a year. But indirect costs to the national economy through premature death of adults in the prime of their working years were calculated at some $22,000 per death. The cost-benefit problem will be another important aspect in the HIV/AIDS prevention and control plan. Analysis was made recently by Kongasin and Dhiratayakinant (9) concerning the routine screening test for HIV-antibody. Their analysis indicated that ELISA is much more cost-effective than expert’s judgment in every point. If so, serosurveillance may contribute a great deal to the national economy by saving a lot of money of the Government budget. It was further reported that a new administrative committee was set up to replace the coordinating subcommittee responsible for distribution of the annual budget for AIDS prevention and control in 1995-1996. The new committee is to be chaired by the Public Health Minister. The budget distribution has always been a problematic matter in the Thai Government.

Social and cultural background for the epidemic HIV/AIDS

Sense of value and view of life of the general public: Although there are still a lot of arguments, the Thai society has been called “a loosely structured social system”. Because, regularity, discipline, regimentation, and willingness to cooperation are not always regarded as the principal virtue by the Thai people (10) when they live in their community in the village and town. There is no compulsory and common system to control the behavior of community members.
The solidarity by traditional custom is a main factor to keep the society. It has also been stated that one of the basic characters of the Thai culture is individualism (11). Even within a family, each member can act rather independently and has much freedom. Blood relation is not always an absolute restriction factor. It appears that such individualism may have developed from many hundred years ago under the influence of the historical conditions and the Buddhism. Most Thai people are more concerned with private matters rather than public matters.

The behavior or the view of life as stated above may not be specific to the Thai people only, but the weak spiritual points common to any human being more or less. Nevertheless, the Thai character to free themselves from restriction appears to be closely associated with the prevalence of AIDS in this country.

In addition, epicurism may be another factor responsible for the prevalence of HIV/AIDS. According to Ruth Benedict (12), the Thai people have a deep-rooted disposition to enjoy life freely and simply. They have a strong belief that human life must be enjoyable, pleasant, happy and easy to spend. Even when they are doing work, the job must be something to amuse themselves. In their daily life, serious attitude, stoicism, or pains-taking endeavor is not always accepted as a virtue. Diligence and saving do not belong to their mottos of the high priority. The Thai people like to say “Take it easy” all the time and to escape from responsibility.

What was described above is the general tendency of their behavior, but we can encounter with many exceptional cases, however. Besides, the socioeconomical development in recent years has changed the sense of value of the Thai people, and the difference of behavior among the generations is becoming greater. The HIV/AIDS epidemiology will be analyzed in the light of sociology. Phongpaicit (13) wrote a book entitled “Peasant girls to Bangkok masseuses”. The book was published in 1982 when AIDS was not present in Thailand, but it reviewed and analyzed correctly the social, economical and cultural backgrounds responsible for the later emergence of AIDS epidemic in Thailand.

Religion and HIV/AIDS (selected topics): Ninety-three per cent of the Thai population belong to Buddhism. Thai Buddhism is “Hinayama” whose doctrine is self-relief attained by individual efforts to accumulate virtues, unlike “Mahayana” whose doctrine is the relief of the general public. Though the individualism is one of the characteristics of the Thai culture and is matching with Thai Buddhism, it is difficult to see to what extent Buddhism is associated
with the prevalence of HIV/AIDS negatively or positively. Therefore, only selected topics concerned are introduced here.

The idea of "Karma" (Retribution) in Buddhism appears underlying in the mind of the Thai people. All of one's sufferings are due to his or her own karma. If so, it follows that AIDS patients are sinners who need to pay for their own sins. Of course, this way of thinking is not admitted in the open society. On the contrary, it is reported that a Buddhism about established a hospice for AIDS patients in Lop Buri province since most people shun AIDS sufferers saying "the disease is a consequence of their own actions" (14). The behavior toward sex problems is different among Buddhists, Moslems, and Christians. According to the questionnaires carried out in Malaysia, respondents having agreed with the public education of condom use and the placement of a vending machine for condom were 22 and 20%, respectively, in Moslems, 46 and 44% in Buddhists, and 37 and 35% in Christians. These data appear suggesting something about the relation between religion and sex, and accordingly the association between religion and AIDS. In Malaysia, the majority of HIV/AIDS cases still belong to IDU. It is thought that, being confined to their strict religions community, some young Moslems try on drugs instead of prohibited alcohol, starting with marijuana and then moving on to heroin (15).

**Economic development:** It appears that the rapid economic development in Thailand is a direct or indirect social factor for the spread of HIV/AIDS. In Fig. 3, the economic development in Thailand from 1970 to 1989 is shown in the increase of gross domestic product (GDP). In 1960s, the annual rate of economic growth had already reached the level of 8% in this country under the first and second national plans for the social and economic development. It can not be denied that this economic growth was accelerated by the Vietnam War in which Thailand played a role of the quartermaster depot to support the military operation of US army. Seven air bases were constructed together with the paved roads connecting between them, five of them being located in the northeastern region. This situation brought in not only a lot of US dollars but also such a new sense of value as to change the life style of local people. As seen from Fig. 4, the economic development has been increasingly rapid up to this time, especially since around 1986. However, the development was not always even or homogeneous throughout the country. It is concentrated in Bangkok and the eastern region where many manufacturing industries were planted by investment from foreign countries seeking for low wages (Table V). Consequently, the difference in
Fig. 4. Increase of gross domestic product (GDP) in the period from 1970 to 1989.

Household income between Bangkok and other regions, or between urban and rural areas, became enlarged. The income per household in the north or northeast region was one-eighth to one-tenth of that in Bangkok in 1987 (Table VI). The people, especially the younger generation, of those regions were attracted to Bangkok to earn money and to experience the new life style of city culture. The development of communication and transportation means, especially the popularization of television, enhanced such population migration. We can not neglect the social or economic changes as above when we think about the mechanism of HIV/AIDS prevalence in this country.

Population migration: The increasingly high rate of migration in the general public has been noted in accordance with the economic development, especially from the northwestern, northern and southern regions to Bangkok. The ratio between female and male has been increasing concomitantly (Table
VII). This is understandable from the fact that the largest labor force to Bangkok has been supplied from the north-eastern regions (Table VIII), and that more working opportunities are found in Bangkok and the vicinity. The migration of female prostitute is a part of this traditional feature of labor mobilization. In the case of prostitutes, however, their migration is not only to distant provinces but also within the same town or nearby communities. The turnover rate of female prostitute is closely associated with their migration, less than 7 years in 63% in Rayang (16), 2 months to 6 years with a turnover rate of 66% in Tak (17) and 3-4 months in Chiang Mai (18). As is well known, the migration of female prostitutes from the northern region, especially Chiang Rai and Payao, to other provinces is the most typical and frequent example. The increasing opportunities of business trip and sightseeing tour in the general population would be another cause of HIV/AIDS spread. The economic growth was made possible on the basis of the nation-wide development of the transportation and communication systems. For example (Fig. 5), the paved highway in Thailand was about 5,000 km in 1965, but it is almost 40,000 km in 1990. The transportation of farm and factory products is made by trucks. The frequent opportunities of truck drivers to

Table V. Geographical distribution of gross domestic product (GDP) in 1987

<table>
<thead>
<tr>
<th>Area</th>
<th>GDP (million bahts)</th>
<th>Population (1,000)</th>
<th>GDP/person (bahts)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangkok metropolis</td>
<td>605,168</td>
<td>8,456</td>
<td>71,566</td>
<td>3.11</td>
</tr>
<tr>
<td>Eastern</td>
<td>100,497</td>
<td>3,232</td>
<td>31,094</td>
<td>1.35</td>
</tr>
<tr>
<td>Western</td>
<td>62,731</td>
<td>3,169</td>
<td>19,795</td>
<td>0.86</td>
</tr>
<tr>
<td>Central</td>
<td>49,519</td>
<td>2,642</td>
<td>18,742</td>
<td>0.81</td>
</tr>
<tr>
<td>South</td>
<td>122,471</td>
<td>6,996</td>
<td>17,506</td>
<td>0.76</td>
</tr>
<tr>
<td>North</td>
<td>138,283</td>
<td>10,488</td>
<td>10,185</td>
<td>0.44</td>
</tr>
<tr>
<td>North-east</td>
<td>155,368</td>
<td>18,622</td>
<td>8,343</td>
<td>0.36</td>
</tr>
<tr>
<td>Country</td>
<td>1,234,030</td>
<td>53,605</td>
<td>23,020</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: Thailand National Statistic Office.
be served by female prostitutes during their job may be one of the spreading factors of HIV in this country.

**International tourism:** In 1973, 11% of the national income of Thailand was brought by international tourism. It ranked the third place in the foreign trade following the first of rice export and the second of sugar export according to Statistical Bulletin of the Bank of Thailand (Dec., 1979). International tourism

### Table VI. Average monthly income (Baht) per household by region

<table>
<thead>
<tr>
<th>Region</th>
<th>Average monthly income (Baht)</th>
<th>Increasing rate in each region (1990/1986)</th>
<th>Rate against whole Kingdom in 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1986</td>
<td>1988</td>
<td>1990</td>
</tr>
<tr>
<td>Whole Kingdom</td>
<td>3,631</td>
<td>4,106</td>
<td>5,621</td>
</tr>
<tr>
<td>Bangkok</td>
<td>6,949</td>
<td>7,877</td>
<td>11,344</td>
</tr>
<tr>
<td>Central region</td>
<td>4,006</td>
<td>4,220</td>
<td>6,060</td>
</tr>
<tr>
<td>Northern region</td>
<td>3,106</td>
<td>3,400</td>
<td>4,553</td>
</tr>
<tr>
<td>North-eastern region</td>
<td>2,555</td>
<td>3,067</td>
<td>3,563</td>
</tr>
<tr>
<td>Southern region</td>
<td>3,657</td>
<td>3,969</td>
<td>5,023</td>
</tr>
</tbody>
</table>


### Table VII. Migration to Bangkok from other regions of Thailand by sex

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>35,869</td>
<td>37,983</td>
<td>39,110</td>
<td>41,390</td>
</tr>
<tr>
<td>Female</td>
<td>34,755</td>
<td>55,840</td>
<td>54,845</td>
<td>68,335</td>
</tr>
</tbody>
</table>

Source: Thailand National Statistic Office.
Table VIII. Labor force (the size of working population older than 13 years) in six regions of Thailand in 1991 (×1,000)

<table>
<thead>
<tr>
<th>Region</th>
<th>Labor force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangkok</td>
<td>3,138</td>
</tr>
<tr>
<td>Central</td>
<td>7,241</td>
</tr>
<tr>
<td>North</td>
<td>6,640</td>
</tr>
<tr>
<td>North-east</td>
<td>11,174</td>
</tr>
<tr>
<td>South</td>
<td>4,040</td>
</tr>
<tr>
<td>Whole country</td>
<td>32,235</td>
</tr>
</tbody>
</table>

Source: Thailand National Statistic Office.

is presently the top industry in foreign trade (Fig. 6), earning more than 100 million bahts in 1990. The Thai Government started a national program of “International Tourism Year” in the middle of 1980s. The number of foreign tourists to Thailand began to increase rapidly in 1986 and more than 5,000,000 tourists visited this country in 1990 (Fig. 7).

About three-fifths of the total visitors in 1991 were from the neighboring countries in Asia. However, it must be noted that one-fourth of the total were from the European countries, nearly four times as many as the visitors from American countries (USA, Canada and others) (Fig. 8).

The number of total hotel rooms in sightseeing places, and Bangkok resorts has also been increasing to accommodate the tourists. For example, the world-famous resort Pattaya beach was a quiet fishing village in 1960s. During the Vietnam War, the village developed into a resort place for American soldiers on vacation. In 1972, the total number of hotel rooms was still around 1,100. In 1980s, it increased so rapidly as to reach the 25,000 level in 1993 from 10,000 in 1987 (Fig. 9). The situation has been the same with Bangkok, Phuket, and Chiang Mai. The development of tourism industry has been inevitably accompanied by the development of sex industry. Soi Patpong in Bangkok became a symbolic example for notorious red-light districts for foreign visitors. Unfortunately in Thailand, the period of the national program to develop tourism
industry fell accidentally on the time of the emergence and prevalence of HIV/AIDS.

In the beginning of 1980s, the Tourist Authority of Thailand (TAT) advised the traveling agents so that they may advertise Thailand emphasizing as a country of temples and natural beauty rather than the place of sex-oriented entertainment. However, the actual effect of this TAT advice was not expected too much because of the big role of international tourism in the revenue and expenditure of foreign trade. Meanwhile, when AIDS exploded on the national consciousness, business at all sex-oriented entertainment places dropped dramatically. This was true at least until 1991, but the scare did not last long.
enough. Tourists came back to crowd the bars, massage parlor, and similar places at most nights in Bangkok, Pattaya, and so on.

_Narcotics:_ The custom to smoke opium had already been prevailing in Thailand in the early part of 19th century, especially among the Chinese people. More than 1,000 opium den are reported to have been present in the Chinese quarter in Bangkok at that time. As a vestige of such history, we can still see traditional silver-made pipes sold only for fun as souvenirs in many tourist resorts. The Opium War occurred in 1840s. After the prohibition of opium smoking, many of such opium dens changed the occupation into tea houses. Narcotism and prostitution have thus been associated closely ever since. One thing worthy of attention is that opium smoking has often been a group practice
sharing the drug and pipe. By doing this way, they felt mutually a sense of solidarity and were able to escape from a sense of guilty. This behavior was inherited to the present time, though opium was changed into heroin and pipes into injectors. It is well known that the first outbreak of HIV-infection occurred among IDU in Thailand.

The total number of IDU in this country is unclear, but the governmental survey in 1989 revealed that 60,323 IDU were under methadone-treatment in 138 Rehabilitation Centers, one-third being in Bangkok. Ninety-six percent of IDU were male and around 50% belonged to the age group of 25 to 35 (19).

Sex behavior of the general public. According to the Thai law, marriage is permitted only to the individuals older than 17 years, and bigamy is prohibited. In 1960, the prostitution-inhibition law was promulgated, by which about 20,000 prostitutes were to be punished every year. They must pay 2,000 bahts or be subjected to imprisonment of less than 6 months. The definition of prostitution is shown in Article 4 of that law. It includes all combination cases of sex partnership between the active and passive sides. This suggests a wide pattern of sex behavior in Thailand.

Despite the legal and administrative status such as above, actual sex custom and behaviors of the Thai males appear to have a wide freedom on the individual level. Besides, the style of sex freedom is different from one social stratum to another, giving more opportunities of HIV prevalence to lower classes.
The accumulated information suggests that prostitution is not always regarded as a particular immoral method to earn money, especially among the peasants in the northern region, but it is one of the usual occupations to make living. The girls and women in the villages are accepted without any prejudice when they return home after working as a prostitute in other rural or urban areas. It is also said that when a girl is born in a family, there is a celebration since the girl will bring wealth to the parents. According to Khuenkaw, the Director of the Daughter's Education Programme Coordinating Center, 65% of girls in Chiang Rai province enter prostitution willingly (20). "Willingly" means that circumstances make them want to go, since that is the only way for them to help
their parents economically.

In addition, the results of the recent study made by Lansam and Viravaida (21) and Hengkictsak (22) indicated that not only economic but also social and cultural factors serve to foster prostitution. Increase of income disparity and information accessibility via the media (esp. television) have caused increased awareness and yarning for wealth and material comforts in the village families and family members. This may be another reason for "Willingly". Young men in the rural provinces are reported to take the same direction of sex trade (23). Such young men like to work at sauna rooms and fitness centers for high-class clients who do not want to be seen in gay bars.

Prostitutes as a vector of HIV/AIDS prevalence: At least during the period from 1985 to 1989, no HIV infection was detected among female prostitutes in
Thailand (1). It was through the first national sentinel survey conducted in June, 1989 that a high rate (44%) of HIV-positives was found in low-class brothel prostitutes in Chiang Mai (24). This situation has been confirmed repeatedly by many serosurveys conducted later. The mechanism of such HIV prevalence was then analyzed epidemiologically and also by questionnaires and interview in depth.

Though the positive rate was different from province to province, the median national rate was 3.5% in June, 1989, increased up to 22.97% in June, 1992, and finally to 28.67% in June, 1993. The rate is also variable depending on the kind of sexual establishment, being much higher among so-called “direct” and “low-charge” prostitutes working in tea houses or brothels than among “indirect” and “high-charge” prostitutes working in massage parlors or members clubs (Table IX), reflecting the difference in sanitary conditions and educational level of clients.

According to the annual census of prostitutes by the Department of Communicable Disease Control in 1990, the total number of prostitutes in Thailand was 86,464 working in 6,160 establishments (Table X). However, the actual number should be more than that. For example, the estimated number (by the United State) is 350,000, and 500,000 by the Thai police authority. What is important epidemiologically is age-matching in sexual partnership and clients, since it has serious consequences for the population dynamics of HIV transmission. Asymmetric partnership, with men much older than women, are more common than similar-age pairs (25). This is particularly true in truckers (65%) in comparison with the general population (51%). In the interview, CSWs may pretend to be older than their ages. So, the above data probably underestimated the level of asymmetry. If the level of asymmetry is high, the result will be a strong gender bias in the age gradient of infection, since women are likely to die before completing fertility and their children will become orphans. The gradient also provides efficient dynamics for continuing transmission of infection, as young women eventually infect their male age-peers, who infect young men, and this pattern continues.

As you see above, men are playing a significant role of potential bridge for transmission of HIV in Thailand. According to Podhistia et al. (26), over 40% of men interviewed reported visiting prostitutes in a year, and 30% of those having prostitute contact had been married. This pattern is in sharp contrast to the western civilized countries where prostitute visits are less common and involve a
<table>
<thead>
<tr>
<th>Establishments</th>
<th>Sexual service</th>
<th>AIDS/HIV prevalence in Dec., 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>*AIDS/ARC (% of the total)</td>
</tr>
<tr>
<td><strong>Members club Bars</strong></td>
<td>Indirect (Negotiation)</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>Massage palors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Disco</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coffee shops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tea houses</strong></td>
<td>Direct</td>
<td>2.67</td>
</tr>
<tr>
<td><strong>Brothels</strong></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Gay bars</strong></td>
<td></td>
<td>0.15</td>
</tr>
<tr>
<td><strong>(Homosexuals)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Epidemiology Division, MOPH.*
small segment of the male population. Such state of affairs brought about inevitably the consequent epidemiological situation of HIV/AIDS in mothers and children.

The Thai Cabinet recently approved the anti-prostitution draft bill making parents, brothel owners and clients punishable by fine or imprisonment terms if they subject girls below the age of 18 to prostitution.

Epidemiological analysis of HIV/AIDS prevalence

**HIV-1 prevalence among young men:** Since 1989, the serosurveillance of HIV-1 infection has been conducted every 6 months among 21-year-old conscripts. Because of the large size (around 50,000 each year) and random selection of the samples, the survey results may be regarded as the most comprehensive and reliable indicator of HIV-1 prevalence in the general population of young adult males. The nation-wide average of the per cent HIV-seropositives was 0.2 in 1988, 1.0 in 1989, and 1.87 in 1990 (27). Conscripts from the northern region had consistently the higher rates than elsewhere. The situation in the later period from 1991 to 1993 was recently reported by Jugsudee that the rates (%) had been increasing yearly in every region. In 1993, they were 3.32 in Bangkok, 3.05 in the central region, 2.53 in the northeastern region, 7.39 in the northern region, and 2.81 in the southern region (28).

---

Table X. Distribution of commercial sex workers in Thailand

<table>
<thead>
<tr>
<th>Region</th>
<th>Establishments of sex industry</th>
<th>Number of commercial sex workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole country</td>
<td>6,160</td>
<td>86,494</td>
</tr>
<tr>
<td>Northern</td>
<td>1,290</td>
<td>10,241</td>
</tr>
<tr>
<td>Northeastern</td>
<td>1,095</td>
<td>8,042</td>
</tr>
<tr>
<td>Central</td>
<td>1,560</td>
<td>22,969</td>
</tr>
<tr>
<td>Bangkok</td>
<td>883</td>
<td>28,656</td>
</tr>
<tr>
<td>Southern</td>
<td>1,332</td>
<td>16,576</td>
</tr>
</tbody>
</table>

Source: The annual census of prostitutes by the Department of Communicable Disease Control (January, 1990).
In view of the particularly high incidence of HIV-1 seropositivity among conscripts in the northern region, more detailed studies have been done by several research groups with the aid of interviews and questionnaires. In some survey, a comparison was made concerning the risk of HIV infection and sexual behaviors between before and after discharge from service. Though the positive rate was 13.1% during the service period, the seroconversion rate within 3 months after discharge was 1.1% (30). A follow-up study for two years of service from 1991 to 1993 revealed that seroconversion was observed in 211 out of 16,455 soldiers (1.28% per year). The geographical difference in the incidence rate among conscripts appeared reflecting the prevalence density of HIV/AIDS in their home town. The incidence was higher in the inductees who were married at induction (31).

Nelson et al. (32) compared the rates of prevalent HIV-1 infection and HIV risk factors among four cohort conscripts in the northern region who entered the Thai Army from 1991 through 1993. The data suggest that there may be a decline in risk behaviors including the increased condom use among young men and the stabilized HIV prevalence. The incidence rates of HIV-1 seropositivity were 10.4 to 12.5 without much site or year differences. These studies may provide an important background knowledge which is helpful to the site and vaccine selection for field trial with a candidate HIV vaccine.

In the study by Beyrer et al. (33), the seropositive rate was compared between 1,068 sex workers and 1,031 male STD patients in the northern region. The rates were 38.3% and 15.9%, respectively.

Lastly, the nation-wide serosurveillance among conscripts carried out in 1993 revealed the geographical distribution of HIV-prevalence as shown in Fig. 10.

**HIV/AIDS in women and children:** At the start (1988) of anti-AIDS program in Thailand, women and children were placed on the periphery of the plan. Today, however, they are in the center of our concern. This is not only the case of Thailand, but also the world-wide situation of HIV/AIDS epidemiology. About half of new cases of HIV-infection are now women. According to the estimation by WHO, more than one million women were infected in 1993 and over 13 million women will have been infected by the year 2000 (34).

This will be the outcome of HIV-prevalence from traditional risk groups to the general population. In Thailand, women usually marry or have sex with older men who have had more sexual partners, thus having more opportunities to be
infected. When HIV-infected women become pregnant, the possibility of vertical infection to new-born babies emerges, which often causes social problem of orphans or abortion. Presently, there are a lot of controversial discussions of these matters in Thailand. At this moment, one to 2% of pregnant women are reported to be HIV-positive. One-third of new-born babies from those mothers are infected and the other two-third are often destined to become orphans.

A movement is now going on to establish facilities to care those unfortunate infants with the supports from the government and non-governmental organizations (35). Even if abortion is admitted, rural women may not take abortion as their option due to its cost.

At one hospital, approximately 20% of infants infected at birth contracted AIDS within 15 months. Most of the children at all hospitals died within four
months after diagnosis. Though MOPH is taking a wait-and-see attitude without any positive comments on the artificial abortion in infected pregnant women, it encourages hospitals by budgetary support to give adequate regimen of treatment to infected newborn babies (36).

Warachit et al. (37) conducted an open cohort study on 55 pairs of HIV-1 seropositive mothers and infants by nested PCR with primers at the pol region. They identified HIV-1 in nine blood samples (16.4%) from the infants at birth and in 19 samples (34.4%) collected one month after birth.

HIV-infection is thus penetrating into family structure involving the housewives and infants, and expanding rapidly into the general population of Thailand. In such an epidemiological situation, "living with AIDS" is becoming the basic concept of the anti-AIDS campaign by the Government (37).

Molecular epidemiology by HIV-typing: It is known that serum reactivity to HIV-1-neutralizing epitopes in the Thai patients is divergent (39). In agreement with this observation, recent nucleotide sequencing study revealed the presence of two HIV-1 subtypes distinct from those isolated in other regions of the world (40); subtype A predominating among sexually infected individuals and subtype B isolated more frequently among IDU (Fig. 11). Subtype A is phylogenetically closer to African isolates, while subtype B to European and American isolates. Nucleotide substitutions between parents within the same subtype are averagely about 4%, being much lower than 17 and 13% for strains in Zaire and the United States, respectively.

The pattern of molecular epidemiology such as above has been kept continuously the same up to now. However, the molecular epidemiology was simplified lately by introduction of serology with synthetic 15-amino-acid V3 loop peptides from HIV-1 Thai genotype A/subtype E and B/subtype B as the antigens. A study with 306 HIV-1-positive sera collected from 1985 to 1994 confirmed that the genotype A/E was introduced to Thailand after 1988 to predominate in sexual transmission (85%). Meanwhile, the genotype B invaded earlier in 1987 to predominate among IDUs (73%). However, there were some sera which did not react to the both specific peptides (41).

The enzyme immuno assay with these synthetic antigens was also employed to the serosurveillance on the geographical and risk-group epidemiology of HIV-1 subtypes in conjunction with sentinel serological survey by MOPH (42). Analysis of 557 HIV-1-positive samples taken from 1992 to 1993, including 357 heterosexuals and 162 IDUs, showed that 96% of the heterosexuals were reactive to subtype B. As for the geographical difference concerning risk-distribution of
the genotypes, the high predominance of type E in the heterosexuals did not show notable geographical differences, but the distribution of type B in IDUs was rather variable among the four regions.

The high predominance of type B is most remarkable and typical (82%) in the southern region, a border area between Thailand and Malaysia (15).

Samakoses (43) also studied HIV-1 genotypes in infants and their mothers in the period from December, 1992 to January, 1994 by PCR on blood specimens from 21 infants born of HIV-positive mothers. The samples of 10 mothers were also tested. PCR was conducted with seven genotype-specific primers (three gag and four env) to differentiate genotype B from genotype E.

Zhe Wang et al. (44) reported that, though amino acid sequences from recent sero-positive converters were very similar to the previously published data, their DNA sequence analysis of HIV-1 isolates from AIDS patients revealed a highly divergence from the previous information. Significant number of AIDS patients (65%), especially younger generations (average 24 years), harbor SI variants. A highly conserved N-linked glycosylation site within V3 was preferentially mutated in HIV from AIDS patients (71%), especially in the SI viruses (100%).

This information dealing with the difference between simple HIV-seropositive and full-blown AIDS as the background of virus mutation appears compatible with the observations of Weniger et al. (45) that different pathophysiologic manifestation of virus phenotype in patients with distinct HIV-1 strain may contribute to the segregation of strains by the risk group (Table XI).
The molecular epidemiology of HIV/AIDS by genetical and serological means is important for the effective vaccine design as well as for the serosurveillance of the infection.

**Export and import of HIV:** One example of the export of HIV to other countries is that by Thai females who are working in Japan as service girls in gay trade locating in red light districts (46). Their total number is estimated at 40,000, 4% of them being reported as HIV-positives. The influx of Thai girls to Japan is largely managed by Japanese crime gangs (yakuza) or Thai mafia (e.g., organization called Gang 14K). Most of them came into the job after the 1985 Plaza Accord which revaluated the yen. Thai girls are also sent to Hong Kong. Meanwhile, prostitutes of China, Burma, Laos and Vietnam come to Thailand by the hand of such brokers (47). Attention must be directed also to the transfer of HIV by Thai fishermen to other Asian countries. According to the report from Indonesia, 108 after 1987 were HIV-seropositive, 26 of whom manifested full-blown AIDS and 22 were fatal. The official statement of the Vietnam Government said that the number of HIV-positives in the whole country was 500, 76 of whom were foreigners. Most of the foreigners were Thai fishermen. Another

### Table XI. Pathophysiologic manifestation and HIV-1 phenotypes in Thai AIDS patients

<table>
<thead>
<tr>
<th>Patients in risk group</th>
<th>HIV genotype</th>
<th>Mean CD4+ level</th>
<th>Opportunistic infection(%)</th>
<th>In-patient mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>Pneumocystis</td>
<td>Non-candidial mycoses</td>
</tr>
<tr>
<td>Sexual</td>
<td>160</td>
<td>204/μl</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>162</td>
<td>(90%)</td>
<td>(11.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDU</td>
<td>66</td>
<td>310/μl</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>77</td>
<td>(86%)</td>
<td>(20.0%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P < 0.001  P = 0.002

From Weniger et al. (45)
report pointed out that drug use among fishermen is rising recently in southern Thailand. This is understandable in view of their severe working environment and of their life apart from the family (48).

Meanwhile, WHO warned a possibility of HIV transfer between Thailand and Cambodia through the trips of UNTAC soldiers for holidays and the repatriation of cambodian refugees.

There would be no need to repeat here the expansion of HIV prevalence along so-called the “narcotic route” associated with “Golden triangle” in northern Thailand.

Clinical characteristics of AIDS in Thailand and opportunistic infections

The clinical features of AIDS in Thailand have been studied by many local scientists. Ruxrungtham et al. (49) made a retrospective survey of their data on 446 consecutive patients attending AIDS outpatients clinic of the Chulalongkorn University Hospital in Bangkok during a 100-week period in 1993/1994. This study revealed increasing number of severely ill patients with HIV in Bangkok as shown in Table XII.

Survival of AIDS patients in Bangkok was studied by Kitayaporn et al. (50) in 330 Thai patients at age of 31 in average. Median survival time (Kaplan-Meier) from AIDS diagnosis was 7.1 months for all patients; one year survival probability was 39.8%. These data tell that survival time of AIDS patients in Bangkok is much shorter than those in industrialized countries, probably because of the delayed diagnosis.

In 1984 and 1985 when HIV/AIDS had not yet been detected in the Thai people, the STD-prevalent provinces in Thailand were as shown in Fig. 12. The locations of high STD incidence were almost the same as those of HIV/AIDS prevalence in the present time. This is understandable since HIV/AIDS is one of STD. It will be accepted that the northern region had already the epidemiological and social conditions favorable for the spread of AIDS when HIV invaded into Thailand. It is no wonder, therefore, that the general epidemic of HIV-infection began in Chiang Mai areas among female prostitutes and male STD patients in 1988. By June 1991, male STD patients had a national median provincial rate of 5% seropositivity. In Chiang Mai and Chiang Rai, however, the seropositivity among STD out-patients was 31%.

In Thailand, the first epidemiological survey of HIV-infection among tuberculous patients was carried out in 1989. Four hundred and fifty-six new
Table XII. Clinical studies on 446 consecutive patients attending the AIDS outpatient clinic of the Chulalongkorn University Hospital

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients</td>
<td>446</td>
</tr>
<tr>
<td>Male (mean age)</td>
<td>81 (32)</td>
</tr>
<tr>
<td>Femal (mean age)</td>
<td>19 (28)</td>
</tr>
<tr>
<td>Risk factor</td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>86</td>
</tr>
<tr>
<td>Homo/Heterosexual</td>
<td>9</td>
</tr>
<tr>
<td>IDU</td>
<td>5</td>
</tr>
<tr>
<td>Clinical type</td>
<td></td>
</tr>
<tr>
<td>Asymptomatic lymphadenopathy</td>
<td>22</td>
</tr>
<tr>
<td>syndrome</td>
<td></td>
</tr>
<tr>
<td>ARC</td>
<td>31</td>
</tr>
<tr>
<td>AIDS (CD4 &lt; 200)</td>
<td>47</td>
</tr>
<tr>
<td>Generalized lymphadenopathy</td>
<td>39</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
</tr>
<tr>
<td>OHL</td>
<td>45</td>
</tr>
<tr>
<td>thrush</td>
<td>26</td>
</tr>
<tr>
<td>pruritic macropapula</td>
<td>27</td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
</tr>
<tr>
<td>seborrheic dermatitis</td>
<td>6</td>
</tr>
<tr>
<td>bacterial skin infection</td>
<td>8</td>
</tr>
<tr>
<td>H. simplex</td>
<td>4</td>
</tr>
<tr>
<td>H. zoster</td>
<td>17</td>
</tr>
<tr>
<td>Chronic fever</td>
<td>10</td>
</tr>
<tr>
<td>Chronic diarrhea</td>
<td>9</td>
</tr>
<tr>
<td>Severe weight loss</td>
<td>13</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>15</td>
</tr>
<tr>
<td>PCP</td>
<td>5</td>
</tr>
<tr>
<td>Cryptococcal meningitis</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Ruxrugtham et al (49).

patients of bacteriologically confirmed pulmonary tuberculosis were subjected to serosurvey for HIV antibody (51). Nine positive patients (1.97%) were confirmed by Western blot. Then, the Tuberculosis Division of CDC set up a sentinel prevalence survey programme of HIV-seropositivity in new tuberculosis patients.
The survey has been done twice annually in Bangkok and nine zonal centers in rural areas. The positive rates were low in the northwestern and southern regions (2 to 3%), but high in Bangkok (8.2%). This uneven distribution of the rate may be roughly proportional to that in the general population (52). Concerning the TB amplification in AIDS patients, Tansupasawadikul (53) reported that TB of any form was found in 52% of 241 AIDS patients. This rate was much higher than 25% of cryptococcosis and 20% of *Pneumocystis carinii* pneumonia. The TB-HIV/AIDS relationship was studied more thoroughly by Uthaiworavit et al. (54) in Chiang Rai Regional Hospital. They demonstrated that the increasing trend of TB morbidity and mortality in recent years was due to a rapid increase of HIV-infected TB cases. Until recently, Thailand had been enjoying a decreasing tuberculosis burden as shown by the epidemiological data that estimated TB infection rate among persons at age 20 to 39 was 78% in 1962 but 29% in 1991. However, the situation is now reversed in Chiang Rai (55). The case-fatality rate of HIV-infected TB patients is 65.9% compared to 11.2% for HIV-negative patients (p<0.01). The age distribution of TB cases became bimodal with a new peak composed of younger HIV-infected persons. At age 20-39 years, TB cases comprised 78.9% of HIV-infected, compared to 28.8% of HIV-negative TB cases (p<0.01). As for the study on delayed type hypersensitivity (tuberculin reaction) in HIV-infected persons, the reports in Thailand are controversial. One study (55) did not acknowledge any deduction of the tuberculin sensitivity in HIV-infected persons, but another study (56) demonstrated the decreased sensitivity in those individuals. Theoretically speaking, however, the change of the tuberculin sensitivity may depend on the degree of reduction of CD4 lymphocytes. This problem is also associated with the usefulness of tuberculin for detection of latent TB cases in HIV-infected persons.

**Blood donors**

In Thailand, donated blood screening was started in 1986 at the National Blood Center of the Red Cross Society. Siriraj Hospital and Ramathibodi Hospital in Mahidol University came also into the pioneering activity for the screening and established a routine system for every unit of blood donors in September, 1987. The sentinel serosurvey of HIV infection started in 1988 including blood donors for the survey subjects. In this way, the screening system has been in-
Fig. 12. STD-prevalent provinces in Thailand by reported cases in 1984 and 1985 (Source: Annual Epidemiological Surveillance Report, Division of Epidemiology, MOPH).

creasingly expanded. The seropositivity of donated blood has been increasing from 0% to about 1% in the nation-wide average. However, the rate is much higher in the such provinces as Chiang Mai, Chiang Rai and Payao; 4.2%, 3.5% and 5.8%, respectively, in 1992. The data obtained in 1993 are shown in Fig. 13.

Another interesting piece of information is concerned with the rate of window period blood donation in Bangkok. Kaewkungwal et al. (57) analyzed retrospectively the computerized record of all blood donors at a public university hospital in Bangkok. HIV-1 seroconversion rates were calculated on the assumption of uniform distribution between the last negative and first positive tests. On the assumption that the period between onset of infectivity and the
appearance of detectable antibody is 45 days, the number of such "window-period" donors was 23.6/100,000 donors. Of all donated blood units, 5.7% was rejected due to HIV, HBsAg, or VDRL positivity. A conclusion drawn from this study was that the expected number of window period of donations among Thai repeat donors was relatively high compared to that in developed countries.

Counseling and education

Increasing provision of counseling and public education is a top policy of the Thai Government for prevention and control of HIV/AIDS. Various NGOs and voluntary organizations have also been involved in this movement.

Counseling and education are to provide psychosocial support of HIV-infected people, AIDS patient, and the general people who must be encouraged to live with HIV-carriers without depriving them of the equal right in the society. Roughly speaking, counseling is made by the person to person interview with HIV-carriers and AIDS patients, and education will be to enlighten the general public on mass level. Both must go hand by hand.

The main part of counseling is to provide them the knowledge how to change their behavior and social attitude together with the accurate knowledge of HIV/AIDS. Much of the need for counseling and education for HIV-carrier people is said to be caused by social reaction rather than the virus itself (58). The last psychosocial support lies in the development of enlightened social attitudes toward HIV/AIDS.

Another important aspect is the cooperation between the health ministry and the education ministry for the anti-HIV/AIDS campaign involving school education (59). This view was an agreement among the participants of more than 50 from the Asian countries to UNESCO-WHO seminar held in January, 1994. The cooperation is expected in each country so that a good financial and technical management is planned for implementation and evaluation of HIV/AIDS-related policies and programs on the national level. If schools world-wide are to be mobilized in appropriate ways for this purpose, the social benefit will be so great.

In Thailand, a school-based community education for AIDS/STD prevention is now under trial in a pilot area aiming at behavior change out of school youths in rural communities. If successful, the future expansion of this trial will be expected to cover wider areas (60).

Out of school youths recruited from the target communities are trained as peer educators to conduct informal peer counseling and interactive education in the village environment. The method to collect baseline data on risk behavior,
condom use and the training method for the recruits will be developed in this pilot study.

There is another study (61) to implement the integrated education program on AIDS and STD among factory workers and evaluate the program by measuring knowledge (K), attitudes (A), and sexual practices (P) (KAP in combination) and STD incidence in Khon Kaen province. The study was made by a comparative observation between 107 workers as the experimental group and 125 workers as the control group with the aid of peer counselors, educators, and the factory-owned communication system. The KAP and STD-incidence were assessed before and after interventions. However, the differences between the two groups were not significant (p > 0.05) in most aspects of expected effects such as KAP-levels and condom-using rates, thus suggesting a long-term need of counseling and education for the appreciable results.

It is usually said that counseling services in Thailand are limited in the private health sectors and are slow in realizing the cost-effectiveness of preventive services. Murphy (62) reported his experiences on STD/HIV counseling services in 100 private hospitals, to hospital staffs, and the evaluation. After all, the private medical sector was slow to realize the cost-effectiveness of preventive services. Private hospitals faced an immediate profit loss by investing staff time to free services. The increasing number of inquiries from clients has prompted some hospitals to see assistance from the public sector for counseling service, but few hospitals are willing to advertise services.

Under the nation-wide prevalence of HIV/AIDS and the increasing social need for "living with AIDS", the need of carrying practices for Thai AIDS patients in their family context were employed by Chanitcharas et al (63). They studied on seven male AIDS patients admitted to a hospital. Their close relatives who provided care for them at home were interviewed. The conclusion drawn was that it is necessary to train the patients and family care-givers to have more knowledge and skill on how to take care for common symptoms, to provide emotional support for each other, and how to seek social services when needed. Such training should be made before the AIDS patients are discharged from the hospital.

In order to promote counseling services a broader range of strategy and technology has been adopted including phone-in service, hot line service, hot line mobile service, traditional forms of entertainment, and modern audiovisual devices (64-66).
On February 28, 1994, Bangkok Post reported “Chuan (the prime minister, Chuan Leekpai) pays surprising visit to AIDS babies” with a picture showing that he embraced an HIV-infected infant at a home. This gave a big emotional and educational effect on the general public concerning AIDS problems (67).

The encouragement for the use of condom is one of the main tasks of counseling and education for prevention of HIV/AIDS. The extent and determinants of condom use in Thailand remains inconsistent among population groups and different also from one survey to another. Generally speaking, however, the condom usage rates among CSW, appear to be increasing recently. In the earlier two studies in 1991 (68,69), the rates were 38% and 54%, but the report of 1994 stated 82% (70) in the average of three different places. Another report of Rajanapithayakorn in 1994 (71) is concerned with the 100% program which was initiated in 1989 and expanded nationwide in 1991. In this program, the achievement was reported that the usage rate in sex establishments increased from under 50% in 1989 up to 94% in June, 1993. This increase was accompanied with the concomitant decrease of the national STD incidence rate from 6.5 per 1,000 population in 1989 down to 4.48, 3.31, 2.07 and 1.64% yearly in the period up to 1993.

The survey conducted by Mookdahn Public Health Center involving 80 CSWs showed that, though 95.8% of them have a fear of AIDS, only 66.7% use condom with their clients. The extensive study by Pramualratana et al. (70) dealing with three groups of population is worthy of attention; 678 CSWs, 330 truckers, and 1,740 men aged from 17 to 45. They suggested from this study that condom use is an inconsistent matter despite the universal knowledge of HIV/AIDS among CSWs and that the strongest determinant of consistent condom use is the nature of the social bond between partners rather than their individual characters.

The breakage rate of condom during commercial sex was 5% according to the study by Chiang Mai University (72). There was also a news that condoms exported to USA were sent back to Thailand since they did not meet the quality standard. MOPH is now conducting quality control of condoms.

Vaccine programs

In connection with the vaccine development plan for AIDS prevention, Thailand has often been a topic of discussion as a candidate place for field trial. This may probably be due to the following reasons: [1] Thailand is now undergoing a big epidemic of HIV/AIDS and may provide a good opportunity for
field trial, [2] Thailand has one of the most comprehensive AIDS prevention systems in the world (the 1993 World Bank Report on Public Health Investment), [3] the infrastructure including the communication and transportation systems is well established and function satisfactorily, [4] the Thai Government has a good administrative system for implementation of the public health plans, [5] the HIV/AIDS prevalence is a serious national concern in Thailand, and public and private sectors are cooperative in accepting foreign aid. It is reported that WHO may set up an international vaccine institute in Thailand whose function is partly associated with vaccine trial. Korea and Vietnam are competitive candidate countries for this plan.

In view of some confusions occurred before, MOPH in cooperation with WHO made public “The National Plan for HIV/AIDS Vaccine Development and Evaluation” as a guideline for the preparation and evaluation of the safe and effective AIDS-preventive vaccine. At the same time, the formal procedure to get approval for field trial was made clear by showing the sequential steps including the National AIDS Committee, the Subcommittee for Technical Aspects, the Data Safety Monitoring Board, and Ethical Committee.

In the 4th National AIDS Seminar held in Chiang Mai, July, 1994, Dr. Thongcharoen disclosed the plan of two AIDS vaccine tests to start in 1995; one is by Mahidol University and the other by Armed Forces Research Institute of Medical Science (AFRIM). Both of the candidate vaccines to be tried are GP120, a synthetic vaccine prepared imitating the outmost membrane of genotype E HIVs. Further information tells us that Mahidol University will conduct the test among IDU while AFRIM on people of all public sectors. These vaccines have already passed Phase I and Phase II tests in USA where the vaccine was designed and developed.

According to WHO, 16 candidate AIDS vaccines recognized as “promising” are listed in the Jeneva office. However, a general impression is prevailing that AIDS-preventive vaccine development is still on an uphill road.

International cooperation for prevention and control of HIV/AIDS between Thailand and Japan

Industrialized countries and international organizations have been supporting the activities of MOPH by budgetary provision of various categories and through technical cooperation. They are European countries, Australia, New Zealand, Japan, WHO, UNICEF, UNFPA, ICRC, and so on.
According to Thailand Health Profile issued in 1990 by MOPH, Japan was the top contributor among them in 1987 to 1989 by providing $7,300,000 as grant-aid, $2,800,000 for equipments, 79 fellowships, and dispatch of 128 experts for technical cooperation.

When HIV/AIDS has become a serious health and social problem in Thailand, MOPH requested an AIDS-specific support to the above countries and organizations in December, 1988. This request was mostly accepted, since HIV/AIDS is a global problem and the situation in Thailand is closely associated with the epidemiology of the other areas of the world.

After discussion and negotiation with the Thai Government, the Japan International Cooperation Agency (JICA) started, July, 1993, a new technological cooperation project for prevention and control of HIV/AIDS in Thailand. The project is mainly concerned with laboratory diagnosis of AIDS and associated opportunistic infections on one hand and public education with the aid of advanced audiovisual technologies on the other hand. Provision of the necessary equipments was also included into the items of cooperation. Various NGOs of Japan are also working to assist AIDS campaign in Thailand.

Prospects

As shown in Fig. 13, the AIDS/ARC ratio is increasing rapidly since the beginning of 1993, especially in infants. The ratio will be the combined results of shifting from inapparent HIV-infection to ARC and from ARC to AIDS. The characteristically high AIDS/ARC ratio in infants may suggest that the latent period of the disease is shorter in vertically infected infants than that in other risk groups. It is around five years since the start of AIDS epidemic in Thailand, and it is quite likely that the conversion to full-blown AIDS from ARC and HIV-infection is now increasing to come into the peak period sooner or later.

In order to estimate the number of people with AIDS/HIV in the present and future, established in 1991 was the “Thai Working Group” comprising the representatives from MOPH, other governmental and nongovernmental organizations, and WHO. According to the estimation by this group, Thailand has a cumulative total of 200,000 to 400,000 cases as of September, 1991. At the end of 1992, MOPH updated this number to 350,000-500,000. The group projected also the future situation of AIDS/HIV under an assumption that there would be no change in the behavior of the Thai people. Two to four million cumulative HIV-infections and 350,000 to 650,000 cumulative AIDS cases by the year 2,000 were estimated by the group. It should be noted that the group has
Fig. 13. Rapid increase of AIDS/ARC ratio in vertically infected infants.

already suggested the future increase of AIDS-related mortality among infants and young children.

Thailand is now going to confront with a critical time of AIDS/HIV epidemic.
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