National AIDS Program

Ministry of Health

Report on

HIV sentinel surveillance 1997

USAID/AIDSCAP

French Cooperation

Report on 97' HIV Sentinel Surveillance

Executive summary

This third round of HIV sentinel surveillance started in April 1997 and finished in June 1997. Six population groups have been surveyed. The number of sentinel sites varied from 17 to 22 depending on population groups.

1. Background

HIV known as human immuno-deficiency virus which induced AIDS has been alarmingly spreading in the Kingdom of Cambodia since the first detection at the National Blood Transfusion Center in Phnom Penh in 1991. Up to late 1996, the cumulative number of people infected with HIV is estimated to be between 70.000 - 120.000. Estimate from 1996 suggests that approximately 17.000 to 25.000 new infections per year are happening in the Kingdom. Over 80% of all infections are occurring in sexually active people. More than 90% of infections are transmitted through heterosexual intercourse. Reliable estimation and projection of I1IV/AIDS patient are required to provide accurate information lo (ho policy maker so that they can take any eventual measure to prevent the spread as much as possible.

In 1991, prevalence rate of 0.08% among blood donor in Phnom Penh was reported having antibodies to HIV. Soon after in 1992, a survey conducted by Cambodian National AIDS Program among commercial sex workers and sexual transmitted disease patients in Phnom Penh. More we went through detail more we get to know better the epidemiological situation of the disease in our country. In 1994, an alarm of high prevalence rate - 39,4% of commercial sex workers, 9,1% of sexually transmitted disease patients and 4,3% of blood donor having antibodies to HIV- rang to Cambodian AIDS Program.

That was the reason why we had lo establish first round of HIV Sentinel Surveillance in 1995 focusing on high risk population in the hot hit provinces. At that time the program was financially and technically sponsored by WHO. We carried out in 9 provinces in the country within 8 targets groups - direct and indirect

commercial sex workers (DCSWs & ICSWs), miners, police (POL), military (MIL), military police (MP), pregnant women(PW), and tuberculosis patients(TB). The result was remarkably showed that almost 38% of CSWs and 2.6% of pregnant women which are considered as lowest risk group, are HIV positive. In order to know much better about the HIV / AIDS situation in Cambodia, second round of HIV sentinel surveillance in 1996 sponsored by WHO and AIDSCAP was carried out. The sentinel site was expanded up to 18 provinces and focused on five risk groups - CSWs, Police, Military, TB patients and PWs. Since some target groups have almost the same prevalence rate and risk behavior as others. The average HIV infection rate among those groups was: 41%, 5.3%, 6%, 3.9%, and 1.7% respectively. Comparison between the 1995 and 1996 data from the same provinces along the border provide data for analysis of trends across these populations for this region. A remarkable increase from 37% lo almost 50% and from 2.5% lo 3% of HIV prevalence rate among CSWs and antenatal clinic attendees respectively. The mean prevalence rate in the police and military were similar in 1995 and 1996 with 8.1% to 9.4%.

The data suggests that the epidemic has begun to affect both people who engaged in high risk behavior and the general population. The provinces which are most affected are along the Thai border to the west and part of the south (Bantcay Meanchey, Baltambang, Posat, Koh Kong, and Sihanoukville) and the Vietnam / Laos border to the Last (Ratanak kiri). We have noted as well that up to second round of HIV sentinel surveillance only urban area easy to reach was focused. In 1997, the third round of sentinel surveillance sponsored by USAID/AIDSCAP and French Cooperation have expanded nationwide-urban to rural- and focused on 6 target groups (PWs, Hospital in-patient, Police, Military, and TB patients). The survey started from April 1997 and sera collection finished by 20 June 1997. Up to 20 July, sera processing conducted by 3 internationally trained laboratory technicians of Preah Bath Norodom Sihanouk Hospital, under the supervision of two National AIDS Program officers, was terminated. Since then all data are compiled and computerized at National AIDS Program office, Ministry of Health. Data analysis was assisted by International Expert - Dr. James Chin (Clinical Professor of Epidemiology, School of Public Health at Berkery, University of California). The program of HIV sentinel surveillance is fully participated by all levels of HIV/AIDS prevention program and

the institutions involved - national to provincial and district level -.

II. Objectives of the survey

The survey was conducted in order:

1. To determine the geographical spread of HIV infection.
2. To monitor the trend of HIV epidemic among risk groups over time and places
3. To provide reliable information tar estimation and future projection of HIV/AIDS epidemic in Cambodia
4. To mobilize national and international support for HIV/AIDS prevention and care program.
5. To provide useful data to the government and other non-governmental organization.
6. To provide reliable data for planning health and medical care services.

III. Scope and Coverage

Geographically, it has been decided that the 3rd round of HIV sentinel surveillance have to cover all the 22 provinces and cities in the country except unsecured and non-accessible area. All towns are considered as urban area. Sihanouk Ville, Kep and 7 khan in Phnom Penh are considered as urban area as well. The rest of the countries are considered as rural area. More importantly we wish to remind that urban or rural considerations are also depend on the target group. All Commercial Sex Workers registered in the survey are considered coming from urban areas. Provincial and municipal program managers are supposed to pay attention to urban and rural sera samples, registration or coding and sampling.

The registration sheet in which we registered the name of provinces and districts, date of the sera collection, code number, age and sex (sec the attached in annex 1) is prepared and provided by NAP. Six target groups have been included in the survey (Antenatal clinic attendees, Hospital In-patients, Police personals, Military personals, and Tuberculosis patients). The definition of each target group is shown in table 1. A range of code number is different from target group to another.

12 provinces for Commercial sex worker, 11 provinces for Police, 11

provinces for military, all 22 provinces and cities nationwide for pregnant women, 17 provinces for hospital in-patient and 19 provinces are chosen in this survey.

III. Survey design

This survey is a cross-sectional study to monitor the spread and trend of HIV infection overtime by target groups and place. The survey was performed in accordance to voluntary, unlinked and anonymous. Six target groups were chosen to be surveyed. Sentinel sites and sample size of Commercial Sex Worker, Police and Military were designed bused on I he 1996 sentinel surveillance. On the other hand, sentinel sites and sample size of Tuberculosis patients and Hospital in-patients were designed based on data of TB patients by province and district provided by GNAT (Centre National Anti-Tuberculosis) and data of hospital inpatient collected by planning unit of the Ministry of Health. All collected samples are primarily tested by Particle agglutination method using Serodia HIV1-2 kits. Then the positive samples are confirmed by Enzyme Immuno Essays methods using Genelavia mixte HIV 1 and 2 kits.

IV. Sampling design

Sampling designs are different from target group to target group.

1. Sentinel Site (sec Figure 1)

For Commercial Sex Worker, 12 provinces and cities are included in the survey. Site selection criteria was based on HIV seroprevalence in 1996. 3 provinces with low prevalence rate, 3 provinces with moderate prevalence rate and 3 provinces with high prevalence rate, 2 new provinces of 97 round (Kampong Thorn and Preah Vihear) and Phnom Penh city are included in the survey.

For military and police groups we also based on 1996 round of HIV seroprevalence. So 3 provinces with low prevalence rate, 3 provinces with moderate prevalence rate, 3 provinces with high prevalence rate, and 2 new provinces of 1997 round are registered.

For pregnant women, all 22 provinces and cities are requested lo joint the survey. Not only antenatal clinic attendee but also pregnant women in the community

who do not or can not come to antenatal clinic are selected.

For hospital in-patient, 40 clusters out of 165 primary sample units (created by a national hospital or a provincial hospital or two or three health care centers of district level in which more than 180 patients are annually admitted) were randomly selected. In those 40 clusters we have 19 clusters from urban population and 21 clusters from rural population. 19 clusters in urban area are selected from 10 national hospitals or provincial hospitals. Among those, 1 cluster was formed by 3 health care centers in the capital and two others national hospitals – Preah Bath Norodom Sihanouk Hospital and Preah Kosamak Hospital - formed 5 and 8 clusters respectively. On the other hand, in 21 clusters from rural areas are created from 22 health centers of district level in which we have 2 clusters created by 2 health centers for each and another district in which we have chosen 2 clusters.

And for tuberculosis patient, 40 clusters out of 50 primary sample units (created by tuberculosis center at national level or provincial level or two or three district level in which we have more than 100 patients per year). Among those only 6 clusters are strictly from urban area. The rest, each cluster are composed by urban and rural.

2. Sample size

As far as sample size are concerned, different target group required different sample size.

All Commercial Sex Workers in a province or at maximum 200 samples are required in the survey.

100 lo 150 samples from Police and Military in which half of the sample collected from urban police personals and the rest from rural area.

200 lo 250 samples are supposed to be collected from pregnant women in each province. Half of them are supposed lo be collected from urban area and the rest from rural.

A minimum of 30 patients in each cluster of hospital in-patient and 25 patients in each cluster of tuberculosis patient are required in the survey.

V. Methodology

1. Specimen collection method:

Blood specimen is required for H I V testing in our survey. In a tube at least 5 mi of blood are supposed lo be taken from each individual with the respect of universal precaution by health care worker - by using disposable syringes, gloves, cottons, alcohol , bleach and so on. After centrifugation, 2 ml of sera are transferred to another tube for sera processing.

2. Specimen storage:

Provincial level : Blood specimen collected are storage at room temperature for 3 to 4 hours if centrifuge machine are not available. Seeing that the sera are separated from other part of the blood, transfer it to another tube (cryotube) by separate Pasteur pipettes. Then storage of the sera are at low temperature of the freezer or if not available in collar box with ice.

National level : While transporting the sera from province to Phnom Penh, cold chains are requested to assure by another collar boxes with ice. In order to maintain good quality of sera, it supposed to reach national level within 24 hours after departure from province. Arriving at Phnom Penh, all sera are stored in a freezer of Preah Bat Norodom Sihanouk Hospital (0°C to 10°C).

3. Sera processing :

All sera were treated for HIV test.

First of all, Particle agglutination mcthod(Scrodia HIV 1-2) is used for screening all samples.

Next, the positive samples are again tested by the same particle agglutination for human error elimination.

Last, the positive samples at second test of particle agglutination are confirmed by Enzyme Immuno-Essays (Genelavia Mixte HIV 1-2).

VI. Organization of the survey

National AIDS program manager is the team leader of the survey. To facilitate the survey, each provincial AIDS program manager has to be responsible for this survey in his province. In each province there was one surveillance officer directly in charge of the survey.

One pre-sentinel surveillance workshop was held in Ministry of Health before we begin the survey to provide technical and management support. All provincial program managers were invited to join the workshop. The materials for sera collection were send lo each province or bring back to their own provinces after the workshop. In each province, program manager is responsible for selecting the appropriate population in district level to participate in the survey.

April 24, 1997 survey got off the ground nationwide with a total 257 staff used for sera collection and 26 officials for the supervision (4 from national level). All sera collected at district level until required sample size is reach if cold chain is available. Otherwise sera have to be sent to be stored in collar box provided by national AIDS program at provincial level within 24 hours.

By June 24, 1997 all sera have to be send to national level which is responsible for sera arrangement and storage.

Sera processing were conducted at national level by 3 lab technicians and 2 supervisors from national AIDS program.

Data entry and computerization was done by 2 national AIDS program staff.

Data analysis by EPI-INFO and SPSS and consultation of international expert.

VII. Data collection

After returning from the pre-sentinel surveillance workshop, each province has its own layout sketch down to district level. In some provinces, program manager invited the staff involved to join a meeting to provide technical support, and some others, manager went directly to the district concerned and provides technical assistant to

district's staff. All staff involved from provincial level to district level was supposed to be qualified for taking blood, coding, and registering. All specimen collection at district level was supervised by staff of provincial level and/or national level if necessary. Each province was supposed to send to national level, half of the sample size required by the end of the first month and the rest has to be send by June 24''' 1997.

VIII. Data processing

1. Manual processing :

While collecting blood, some information are supposed to be collected from people such as: general information on location, dale of survey, age, sex. Code number on the blood tube has to be the same code number on registration sheet that registered all the information involved. Then after centrifugation, the sera have to be transferred from the blood lube to a cryotube which is coded the same code number as blood tube. (See an example of registration sheet). Result of the test is marked on the same sheet for particle agglutination and EIA.

2. Data entry and computerization

All information on the sheet was recorded in computer-software EPI INFO and SPSS. Exposure groups, age, age groups, sex, provinces, locations, particles agglutination result and EIA of each individual are recorded by coding (Sec table 2). Two staff performed double-checking twice by random selection some data in each target to check.

IX. Limitation of data

The extrapolation of the result to get a generalization of urban and rural population may be affected by both sampling error and non-sampling error.

Sampling error in the 3rd round sentinel surveillance:

- Half of the samples of each target group except commercial sex workers, were from rural. However those samples were not totally

from rural area because some of them were collected from district level and commune or village were not accessible. So those samples are semi-urban but considered extrapolated as rural.

- For several reason, some health centers or anti-tuberculosis centers selected haven't enough samples as informed by CNAT or planning unit of Ministry of Health.

Non-sampling error in the 3r round sentinel surveillance:

- The result of HIV testing recorded consists of negative, indeterminate and positive cases. Only positive cases are counted ir, the analysis, so we still miss some indeterminate cases which is not confirmed by other test.

- Some others important errors were: error in telling age, coding, human error while entering data.

X. Result of the survey

By the end of the period of data collection, we have totally collected 10899 samples in which 5976 samples from urban area and 4923 samples from rural area. In term of gender, we have collected 3766 samples from male population and 7133 samples from female population. A wide range of age group are included in this survey: 1 sample with the age under 13, 985 samples (9%) in the range of 14 to 19, 4767 samples (43.7%) in the range of 20 to 29, 3325 samples (30.5%) in the range of 30 to 39, 1110 samples (10%) in the range of 40 to 49, and 711 samples (6.5%) aged more than 50. Among 10899 samples, 5003 samples were collected from antenatal clinic attendee, 1155 samples from hospital in-patients, 1 132 samples from commercial sex workers, 1325 samples from police personnel, 1249 samples from military personnel and 1035 samples from tuberculosis patients. The breakdown by sex, location and age group of each exposure groups are shown in table 3.

After HIV testing by particle agglutination method and confirmed by enzyme immuno-essays, we found out in total 896 samples are positive, in which 677 samples from urban and 219 samples from rural area. 254 among them are male and 642

among them are female positive. Breaking down by age groups: in the first range, no sample positive, in the second range 151 samples (16.8%) positive, in the third range 483 samples (54%) positive, in the fourth range 193 (21.5%) positive, in the fifth range 49 (5.5%) positive and 20 samples (2.2%) positive. Break down by sex, location and age group are shown in table 3.

XL Analysis and Finding:

Finding

The average HIV prevalence rate among the direct female commercial sex workers (FCSWs) appears relatively stable at about 40% since 1995. However, the provinces sampled during the three rounds have all been somewhat different and this may partly obscure any specific regional increase that may have occurred. The mean HIV prevalence rates for the other three groups have similar patterns. All three were lower in the 1996 round compared to the 1995 and 1997 rounds. Again, this general finding probably is the result of the selection of different provinces for each of the HSS rounds. During the 1997 HSS round, specific attention was given to include antenatal women from rural areas of most provinces. This has resulted in generally smaller sample sizes for both the urban and whatever rural samples were collected. Thus analysis and interpretation of the antenatal women data are difficult. In addition, in at least five provinces the HIV prevalence rate found in antenatal women in 1997 was significantly different from that found in 1996 as shown in table 4.

Small sample size may account for much of the differences found, but in Phnom Penh, samples size were both close to 200 or above. Blood bank data from Phnom Penh in 1997 indicate that the prevalence rate in female donors is about 1%. This suggests that the 1997 prevalence rate of 0.8% found in antenatal women in Phnom Penh is probably the more accurate finding, but this raises the question of why the 1996 rate in antenatal women was four times higher than that found in 1997. Of particular concern are (he high 1997 scroprevalence findings in the other four provinces in table 4. Are these reliable findings -are they truly representative of the HIV seroprevalence of most or all of the antenatal women in these provinces? These apparent inconsistencies in the antenatal HSS data also raise serious doubts as to

whether the HIV scroprcvalcnce rates found in antenatal women from the HSS rounds can be used to reliably estimate national HIV seroprevalence in adult men and women as has been done in many countries in sub Saharan Africa.

To examine this letter question in more detail, a review of the gender (male:female) ratio of HIV infection in different population groups may be relevant. In sub-saharan Africa, the gender ratio of HIV infection is close to equal (most studies have shown only a slight female preponderance). In Southeast Asian countries with high HIV seroprevalence (i.e. , 1% of the total 15-49 year old population), a large male preponderance of HIV infection has been found . Table 5 presents the gender ratio of HIV infected population groups in Cambodia.

These findings are in general agreement with a marked male preponderance of HIV infection in Southeast Asian countries where the primary mode of HIV transmission is via heterosexual intercourse. Female commercial sex workers are the primary high risk group in the "Asian" epidemiological pattern of HIV/ AIDS. A relatively small "core" group of FCSWs can develop very high HIV infection rates and they in turn will infect many of their male clients-each infected FCSW may infect up to 10 or more of her male sex partners and this accounts for the very large male preponderance of HIV infections in the early phase of an HIV epidemic in these countries. In the later phases of an HIV epidemic in these countries, the male to female ratio begins to decrease as more and more of the infected males begin to infect their steady female sex partner (i.e. their wives or girl-friends).

Other HIV Prevalence Trends

In addition to I1SS prevalence data, the Cambodian National AIDS Programme (CNAP) routinely receives HIV prevalence data for blood donors and persons who are migrating to countries that require HIV testing. HIV prevalence among blood donors peaked in 1995 at over 4% and has since declined to about 3% in 1997. This decrease is likely clue mostly to better donor selection. Nevertheless, some persons who are at high risk of HIV infection are probably still continuing to be "paid" donors.

Since 1993, HIV testing has been performed for about 2000 Cambodians annually who emigrate to a country that requires an HIV test. The annual male HIV

prevalence rates in this group has ranged from 2% to 3%, whereas HIV prevalence rates among females have been much lower, but their rates increased during the past few years. In 1997 about 2,3% of emigrating males 15-49 years of age were HIV positive while only 0,7% of females of the same age group were HIV positive. This "Migrant" population may be considered in general, to be a low HIV risk population and may be more representative of the "general "adult population of Cambodia than antenatal women. (Figure 2)1 present the HIV prevalence trends among blood donors and international migrants from 1991 / 93 to 1997.

Estimation of **National HIV prevalence**

Estimation of HIV prevalence in any population requires reliable data sets that may be representative of the specific population. Prior to the advent of effective drug therapy that has delayed or prevented the development of AIDS, most developed countries, considered reported AIDS cases to be sufficiently reliable to be used to estimate HIV prevalence by back-calculation method. In the absence of reliable data on the annual number of new may be representative of specific populations, and then to extrapolate the findings from these surveys to estimate the number of HIV infected persons. Application of this latter method to estimate (he number of HIV infected adults age 15-49 in Cambodia in 1997 is presented in table 6.

The 1997 international organization for migration (IOM) seroprevalence data set was used to estimate the number of HIV infections in males and females age 15-49. The prevalence and gender distribution of the IOM dataset was considered representative of the "general" adult population. In addition, estimation of the size and HIV prevalence level of the highest risk -group of males and females was calculated using HSS seroprevalence levels for these risk-groups.

It's realized that the resultant estimation of close to 100,000 HIV infected adults in Cambodia in 1997 is not based on "hard" dataset and the actual national seroprevalence level may be +50% of this estimate. However, this is a reasonable estimate of the current HIV seroprevalence in Cambodia and should be used as the "Working" estimate until additional data can be collected that would support increasing or decreasing this estimate. If reliable data can be collected to indicate that HIV prevalence rates in rural areas are much lower then 1% , then this working

estimate may have to be lowered. On the other hand, if follow-up studies of the high antenatal HIV prevalence levels (>5%) in several provinces verify these high rates, then the national seroprevalence estimate will have to be adjusted upwards.

Short-term Projection of AIDS in Cambodia

If it is assumed that the HIV epidemic started in Cambodia shortly before or around 1990 , and that HIV seroprevalence in 1997 is 100,000 , then the annual number of AIDS cases that have occurred and will develop through the year 2000 can be calculated using a simple computer model (Epimodel). The result of this modeling is presented in Figure 3.

Two possible scenarios are presented. A low scenario has the annual incidence of HIV infection decreasing after 1996 and a high scenario has annual HIV incidence increasing after 1996. Regardless of which HIV scenario may actually occur, the cumulative and annual number of AIDS cases up through the year 2000 will be very similar in both HIV scenarios. This is because both scenarios have a starting point around 1990 and both scenarios result in 100 000 HIV infection in 10997. Both scenarios will have close to 8000 annual AIDS cases during the year 2000. The expected number of new AIDS cases in 1997 in the low scenario is about 3,700 and inn the high scenario is about 2,700, The cumulative number of AIDS cases at the end of 1997 in the low scenario is about 8,500 and in the high scenario it is about 5,600. The cumulative number of AIDS cases in the year 2000 in the low HIV scenario is 27,600 and 23, 400 in the high HIV scenario. Both of these scenarios are equally plausible given the limitations of the available HIV/AIDS data. In the high HIV scenario, HIV seroprevalence will increase from 2% in 1997 to about 3.2% in the year 2000. In the low HIV scenario, HIV seroprevalcnce will only increase slightly from the 2% in 1997 to about 2.3% in the year 2000. The high scenario will result in a much more severe HIV / AIDS epidemic after the year 2000. These modeling results provide fairly reliable estimates and short-term projections of the annual number of AIDS cases that can be expected it) occur in Cambodia over the next few years.

Reported AIDS eases:

The number of reported AIDS cases has increased markedly during the last few years. The 1997 total of 450 cases was extrapolated from the reported number through May

1997. The cumulative total of reported AIDS cases will probably reach about 1000 by the end of 1997. Based on HIV prevalence estimates and the use of Epimodel, the estimated cumulative number of AIDS cases in Cambodia, by the end of 1997, under the low scenario will be 8,500 and under the high HIV scenario will be 5,600. Since the current detection and reporting of AIDS cases in Cambodia are known to be grossly incomplete, both HIV scenarios are equally plausible.

Recommendation

1. Sentinel groups for the 1998 (4th round) of HSS should continue to include
    - Direct FCSWs
    - Police
    - Antenatal women - this group- can be expanded to include all married women regardless of whether they are pregnant or not.

2. The military can be dropped as a routine target group for I1SS. Their general behavioral risk factors are very similar to the Police. However, the military moves quite frequently and they cannot be considered to be representative of a given geographic area.

3. Hospital patient and TB patient should not be included as a routine sentinel group. Special studies should be developed as needed to evaluate the interaction of HIV with TB and the impact of HIV on hospital case loads.

4. When the estimated HIV prevalence is less then 5% , the minimum sample size for any HSS site should be at least 200. If the estimate prevalence is more than 10% the minimum sample size can be smaller –i.e 150 , and if the estimated HIV prevalence is more than 25%, then the minimum sample size can be 100. Collection of the needed samples from any site can be extended to up to 6 months, if necessary.

5. Follow-up studies should be carried out in several of the provinces that had very high HIV prevalence levels (i.e. more than 5%) in antenatal women to confirm of refuse these findings .

6. For the 1998 HSS , a special effort should be made to include antenatal and / or married women in the child - bearing age who definitely live in truly rural areas.

Figure 1:

97' SENTINEL SITES FOR HIV SEROPREVALENCE SURVEY IN CAMBODIA

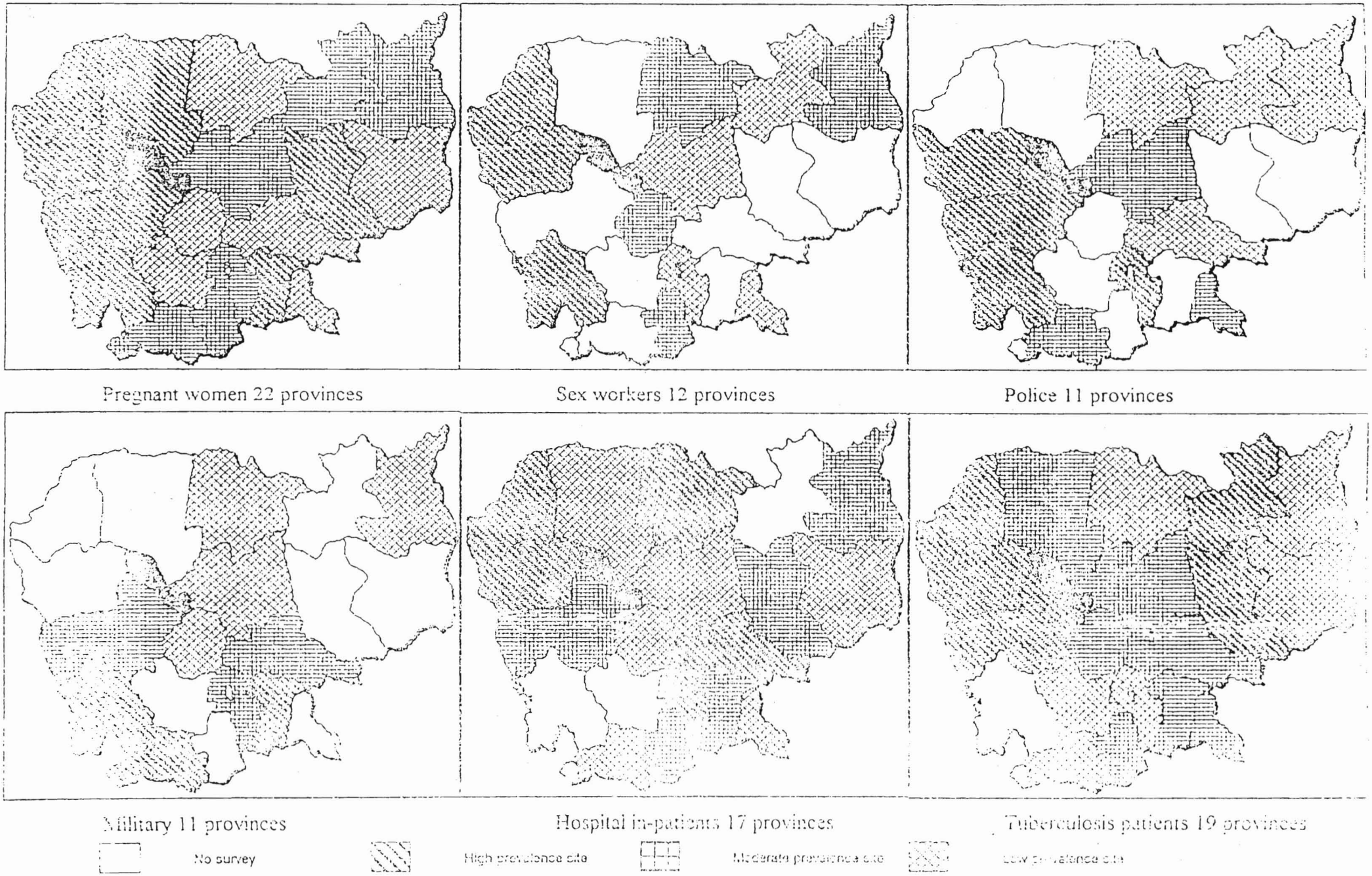
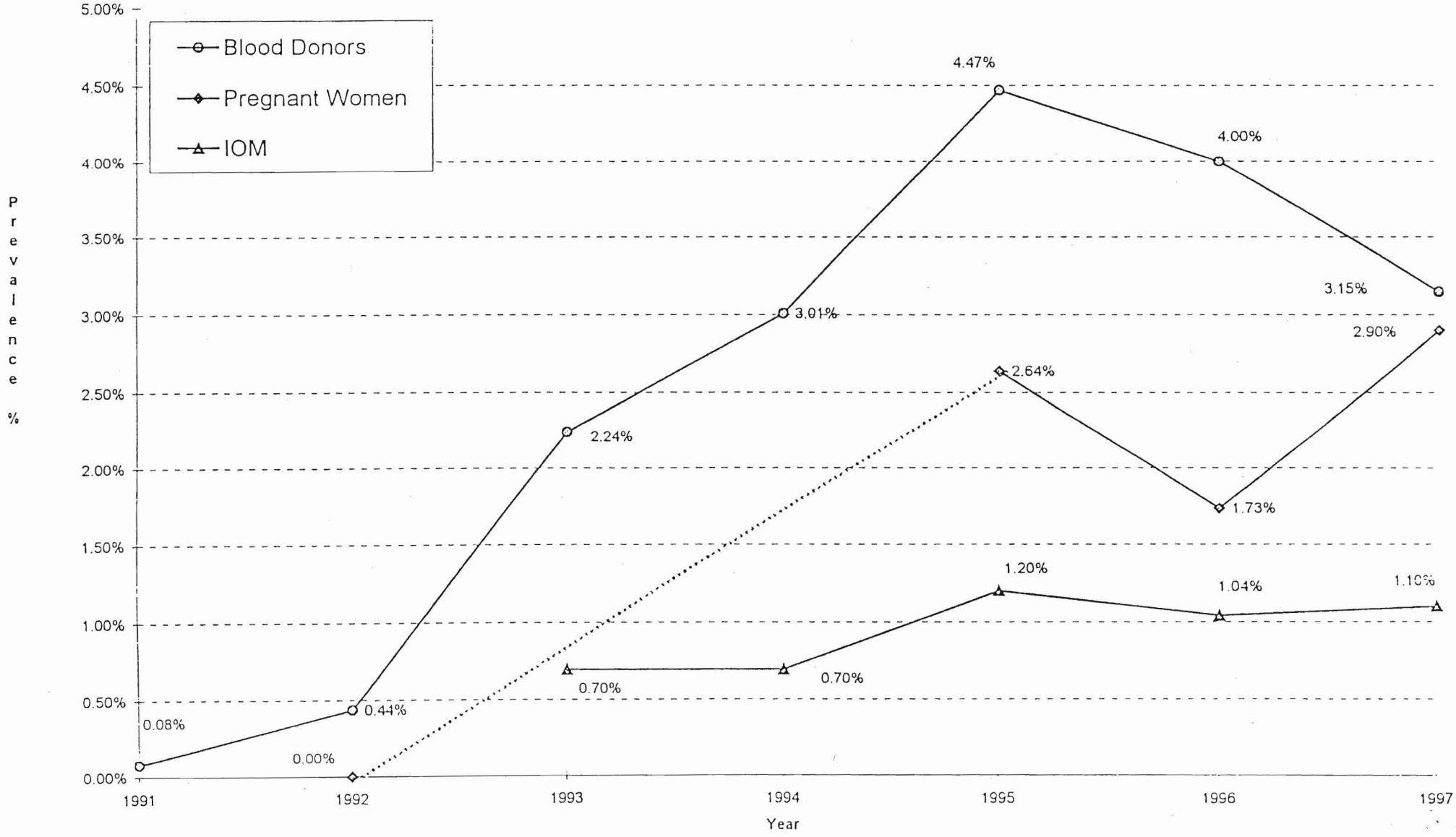


Figure 2: Trends of HIV Infection among blood donors, pregnant women and Immigrant from 1991 - 1997



Source: National AIDS Program / Ministry of Health

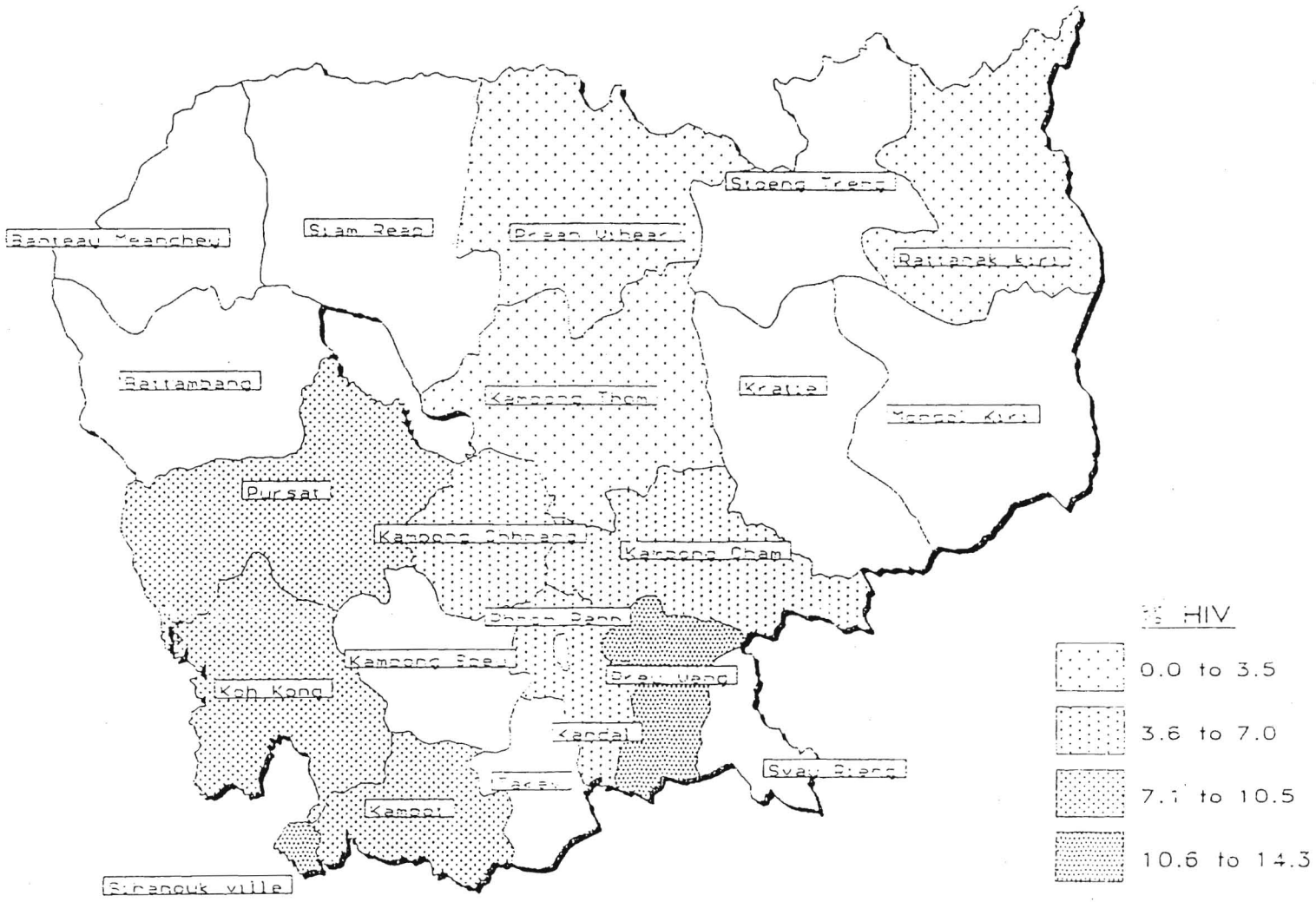
Table 3: Distribution by sex, age, location of target populations , HIV Sentinel Surveillance 1997

	Total	Sex		Location		Age group					
		Male	Female	Urban	Rural	<13	14-19	20-29	30-39	40-49	>50
Total samples	10899	3766	7133	5976	4923	1	985	4767	3325	1110	711
Total Positive Cases	896	254	642	677	219	0	151	483	193	49	20

Pregnant Women	Collected sample	5003		5003	2704	2299	0	452	2681	1631	235	4
	Pos. cases	160		160	86	74	0	12	98	48	2	0
	Prev.	3.2%		3.2%	3.2%	3.2%		2.7%	3.7%	2.9%	0.9%	0.0%
In-patients	Collected sample	1155	675	480	554	601	1	77	303	341	221	212
	Pos. cases	69	48	21	40	29	0	3	21	27	13	5
	Prev.	6.0%	7.1%	4.4%	7.2%	4.8%	0.0%	3.9%	6.9%	7.9%	5.9%	2.4%
Commercial Sex Workers	Collected sample	1132		1132	1132		0	353	675	93	11	0
	Pos. cases	445		445	445		0	133	280	29	3	0
	Prev.	39.3%		39.3%	39.3%			37.7%	41.5%	31.2%	27.3%	
Police	Collected sample	1325	1308	17	613	712	0	12	512	576	197	28
	Pos. cases	79	79	0	37	42	0	1	32	36	10	0
	Prev.	6.0%	6.0%	0.0%	6.0%	5.9%		8.3%	6.3%	6.3%	5.1%	0.0%
Military	Collected sample	1249	1241	8	645	604	0	75	467	471	182	54
	Pos. cases	89	89	0	40	49	0	2	36	40	9	2
	Prev.	7.1%	7.2%	0.0%	6.2%	8.1%		2.7%	7.7%	8.5%	4.9%	3.7%
Tuberculosis patients	Collected sample	1035	542	493	328	707	0	16	129	213	264	413
	Pos. cases	54	38	16	29	25	0	0	16	13	12	13
	Prev.	5.2%	7.0%	3.2%	8.8%	3.5%		0.0%	12.4%	6.1%	4.5%	3.1%

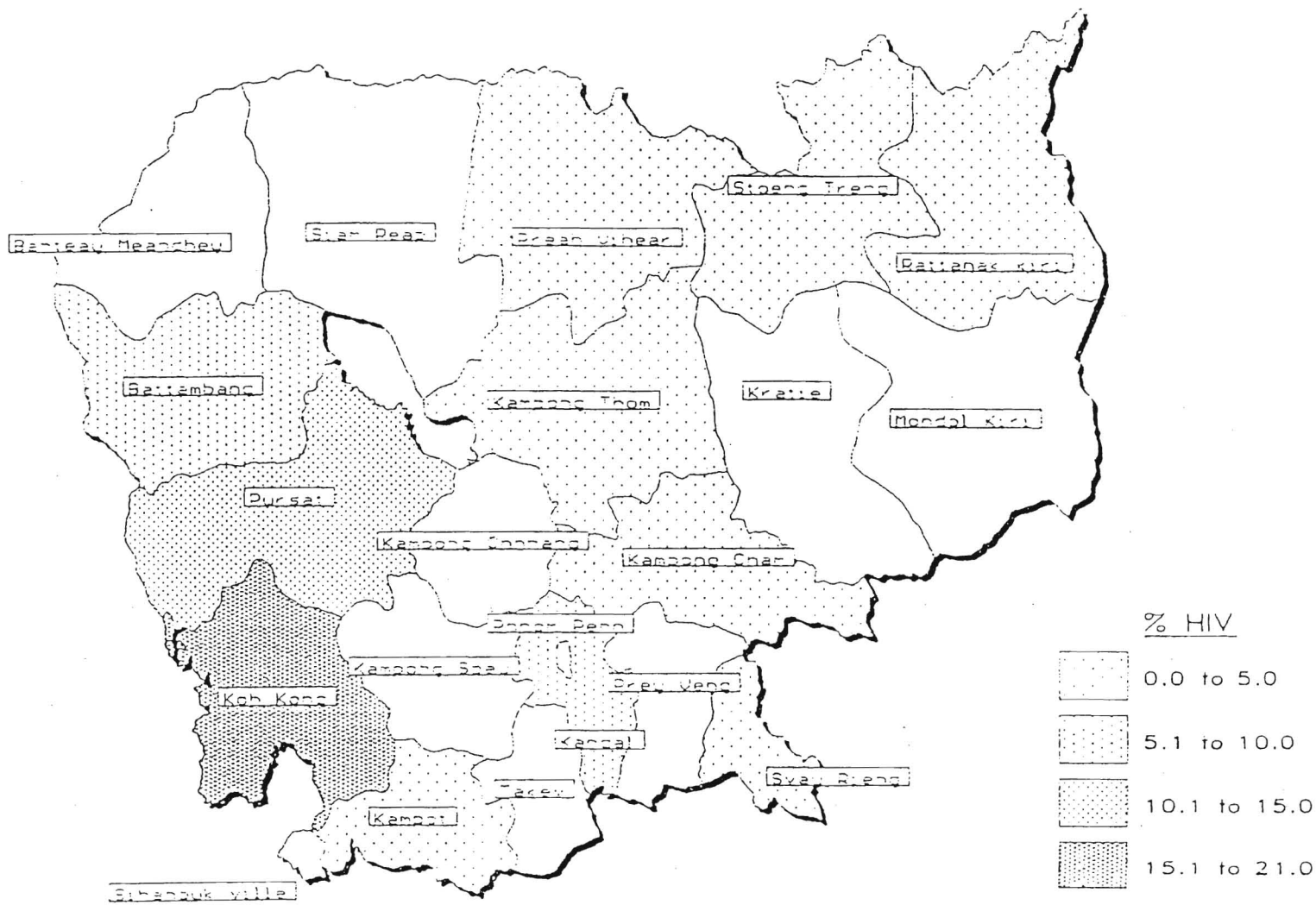
HIV SEROPREVALENCE AMONG MILITARY

CAMBODIA 1997



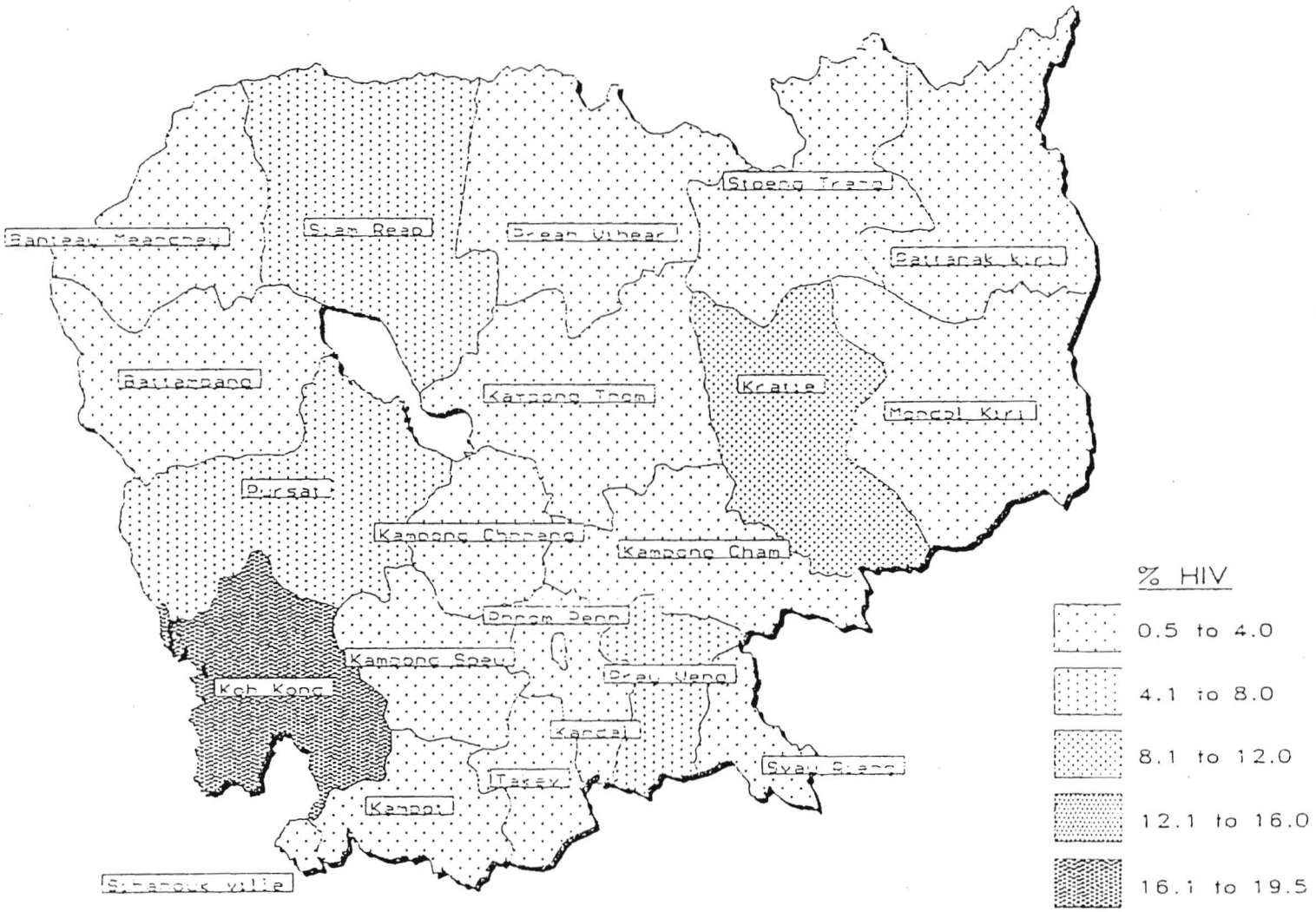
HIV SEROPREVALENCE AMONG POLICE

CAMBODIA 1997



HIV SEROPREVALENCE AMONG PREGNANT WOMEN

CAMBODIA 1997



HIV SEROPREVALENCE AMONG COMMERCIAL SEX WORKERS

CAMBODIA 1997

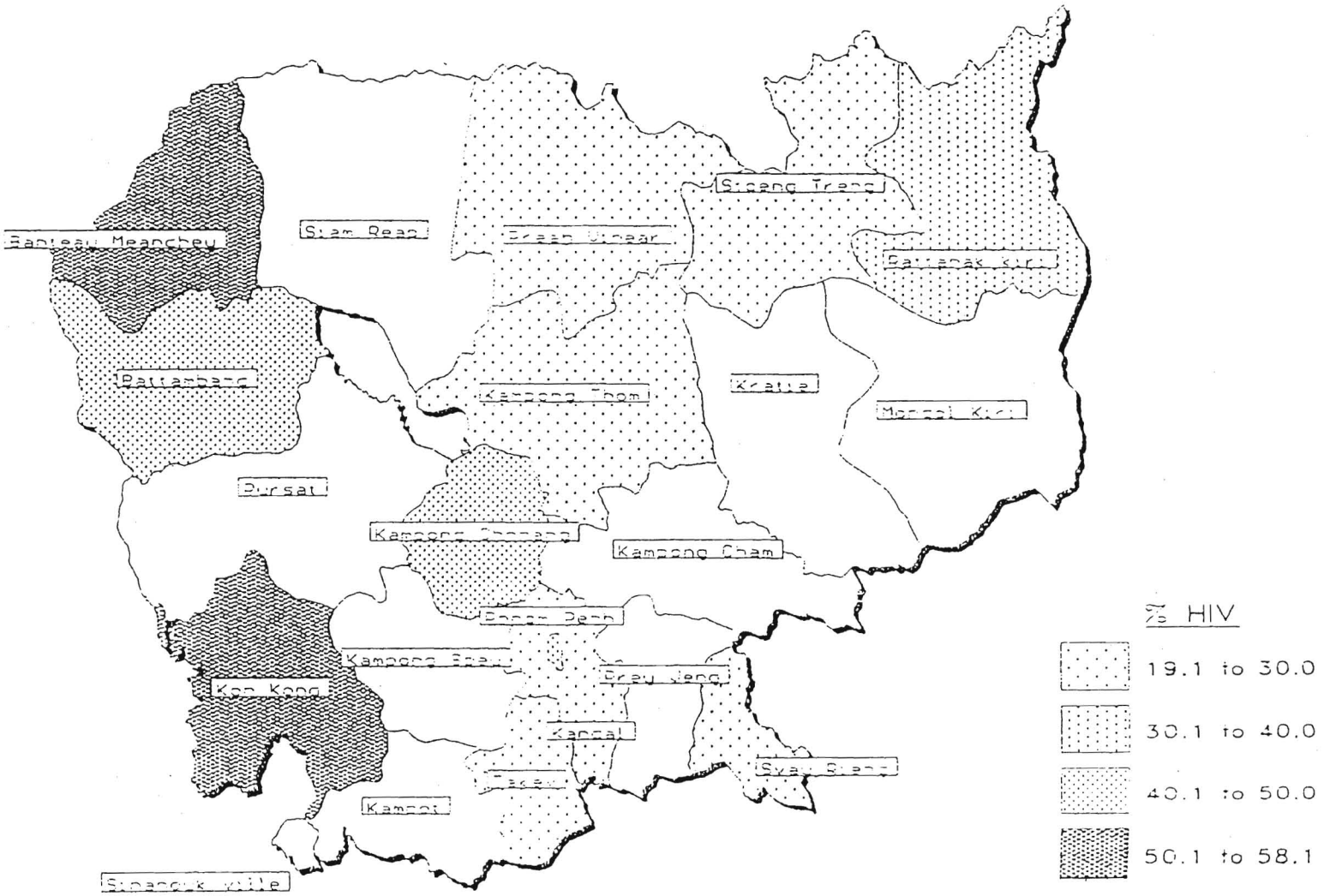
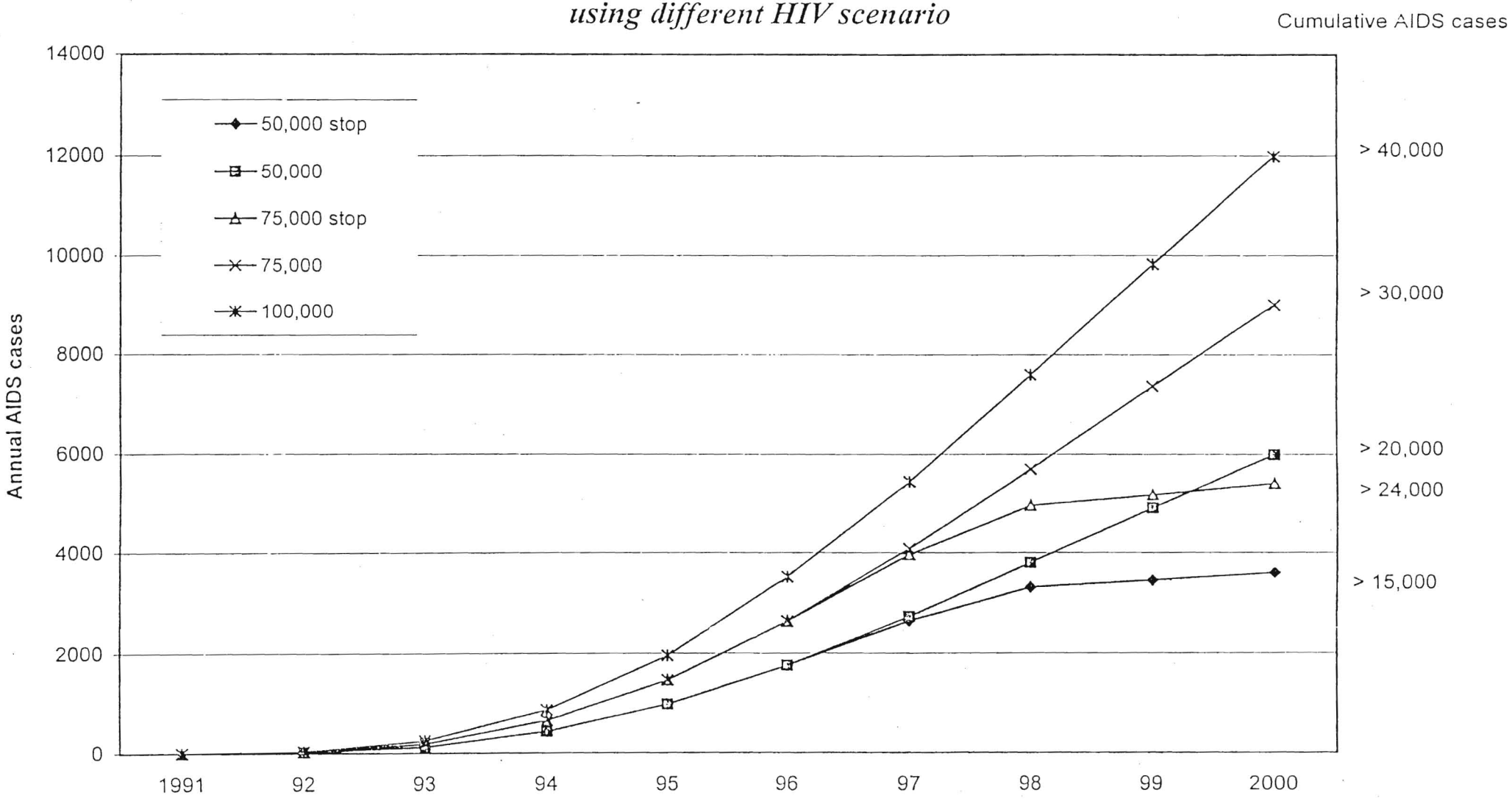


Figure 3: Estimated and projected of adult AIDS cases by Year 2000 using different HIV scenario



NAP - MOH, CAMBODIA 10/3/97

Table 1 : Sample size and sentinel site for HSS 1997
Province : .....

	Cases definition	Sample size	District or hospital in the survey
Pregnant women	All ANC attendant and pregnant women in the community	250 to 300	Half of sample from urban and another half from rural
Hosp. Inpatient	All hospital in-patient admitted after 24 april 1997	Different from province to province	Name of district or health services to be jointed in the survey
Commercial Sex workers	Commercial Sex workers brothel base	100 to 150 or all CSWs in the province	All CSWs in the province
Police	All volontary police personnel	100 to 150	Half of sample from urban and another half from rural
Military	All volontary military personnel	100 to 150	Half of sample from urban and another half from rural
TB patient	All TB patient admitted after 24 april 1997	Different from province to province	Name of hospital or health servinces to be jointed in the survey

Frequency of the survey : One a year
Methodology : Volontary anornimous and unlinked
Deadline of sera collection : June 20, 1997

Table 4: Comparaison table of HIV seroprevalence in sentinel surveillance 1996 and 1997

Province	PWs					
	Test.		Posi.		Prev.	
Year	F Y 96	F Y 97	F Y 96	F Y 97	F Y 96	F Y 97
Battambang	180	170	8	8	4.4%	4.7%
Banteay Meanchey	178	81	3	3	1.7%	3.7%
Kampong Cham	232	122	2	2	0.9%	1.6%
Kampong Chhang	258	137	3	2	1.2%	1.5%
Kampong Speu	210	119	3	4	1.4%	3.4%
Kampot	208	135	4	3	1.9%	2.2%
Kandal	200	154	6	3	3.0%	1.9%
Koh Kong	38	35	2	8	5.3%	22.9%
Kratie	350	140	1	9	0.3%	6.4%
Phnom Penh	186	248	6	2	3.2%	0.8%
Prey Veng	452	30	6	1	1.3%	3.3%
Pursat	174	136	4	6	2.3%	4.4%
Rattanakiri	113	80	7	4	6.2%	5.0%
Siem Riep	248	100	4	4	1.6%	4.0%
Sihanouk Ville	95	278	2	8	2.1%	2.9%
Stung Treng	264	84	2	5	0.8%	6.0%
Svay Rieng	325	87	3	0	0.9%	0.0%
Takeo	218	57	2	3	0.9%	5.3%
Whole country	3929	2193	68	75	1.7%	3.4%

Distribution by sex, age, location of target populations , HIV Sentinel Surveillance 1997

	Total	Sex		Location		Age group					
		Male	Female	Urban	Rural	<13	14-19	20-29	30-39	40-49	>50
Total samples	10899	3766	7133	5976	4923	1	985	4767	3325	1110	711
Total Positive Cases	896	254	642	677	219	0	151	483	193	49	20

Pregnant Women	Collected sample	5003		5003	2704	2299	0	452	2681	1631	235	4
	Pos. cases	160		160	86	74	0	12	98	48	2	0
	Prev.	3.2%		3.2%	3.2%	3.2%		2.7%	3.7%	2.9%	0.9%	0.0%
In-patients	Collected sample	1155	675	480	554	601	1	77	303	341	221	212
	Pos. cases	69	48	21	40	29	0	3	21	27	13	5
	Prev.	6.0%	7.1%	4.4%	7.2%	4.8%	0.0%	3.9%	6.9%	7.9%	5.9%	2.4%
Commercial Sex Workers	Collected sample	1132		1132	1132		0	353	675	93	11	0
	Pos. cases	445		445	445		0	133	280	29	3	0
	Prev.	39.3%		39.3%	39.3%			37.7%	41.5%	31.2%	27.3%	
Police	Collected sample	1325	1308	17	613	712	0	12	512	576	197	28
	Pos. cases	79	79	0	37	42	0	1	32	36	10	0
	Prev.	6.0%	6.0%	0.0%	6.0%	5.9%		8.3%	6.3%	6.3%	5.1%	0.0%
Military	Collected sample	1249	1241	8	645	604	0	75	467	471	182	54
	Pos. cases	89	89	0	40	49	0	2	36	40	9	2
	Prev.	7.1%	7.2%	0.0%	6.2%	8.1%		2.7%	7.7%	8.5%	4.9%	3.7%
Tuberculosis patients	Collected sample	1035	542	493	328	707	0	16	129	213	264	413
	Pos. cases	54	38	16	29	25	0	0	16	13	12	13
	Prev.	5.2%	7.0%	3.2%	8.8%	3.5%		0.0%	12.4%	6.1%	4.5%	3.1%

Summary table of HIV seroprevalence in Sentinel Surveillance 1997, Cambodia

Provinces	*CSWs*			*Police*									*Military*								
				Urban			Rural			Urban + Rural			Urban			Rural			Urban + Rural		
	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.
Banteay Meanchey	198	115	58.1%																		
Battambang	102	48	47.1%	56	8	14.3%	70	3	4.3%	126	11	8.7%									
Kampong Cham				60	2	3.3%	52	0	0.0%	112	2	1.8%	61	3	4.9%	53	5	9.4%	114	8	7.0%
Kampong Chhang	130	57	43.8%										51	3	5.9%	90	4	4.4%	141	7	5.0%
Kampong Speu																					
Kampong Thom	68	14	20.6%	51	2	3.9%	54	1	1.9%	105	3	2.9%	68	0	0.0%	32	3	9.4%	100	3	3.0%
Kampot				50	1	2.0%	68	2	2.9%	118	3	2.5%	50	7	14.0%	64	4	6.3%	114	11	9.6%
Kandal	115	22	19.1%	105	10	9.5%	57	2	3.5%	162	12	7.4%	35	2	5.7%	67	5	7.5%	102	7	6.9%
Kep																					
Koh Kong	100	52	52.0%	33	3	9.1%	67	18	26.9%	100	21	21.0%	35	3	8.6%	65	7	10.8%	100	10	10.0%
Kratie																					
Mondul Kiri																					
Phnom Penh	162	72	44.4%																		
Preah Vihear	20	5	25.0%	67	0	0.0%	34	0	0.0%	101	0	0.0%	120	2	1.7%				120	2	1.7%
Prey Veng													10	1	10.0%	90	11	12.2%	100	12	12.0%
Pursat				71	6	8.5%	66	13	19.7%	137	19	13.9%	66	4	6.1%	92	10	10.9%	158	14	8.9%
Ratanak Kiri	38	13	34.2%	27	1	3.7%	84	0	0.0%	111	1	0.9%	43	0	0.0%	52	0	0.0%	95	0	0.0%
Siem Riep																					
Sihanouk Ville													105	15	14.3%				105	15	14.3%
Stung Treng	53	12	22.6%	39	0	0.0%	74	0	0.0%	113	0	0.0%									
Svay Rieng	88	21	23.9%	55	4	7.3%	85	3	3.5%	140	7	5.0%									
Takeo	58	14	24.1%																		
Total	1132	445	39.3%	614	37	6.0%	711	42	5.9%	1325	79	6.0%	644	40	6.2%	605	49	8.1%	1249	89	7.1%

Summary table of HIV seroprevalence in Sentinel Surveillance 1997, Cambodia

Provinces	*Pregnant women*									*In-patients*			*TB patients*		
	Urban			Rural			Urban + Rural								
	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.
Banteay Meanchey	81	3	3.7%	182	7	3.8%	263	10	3.8%	30	3	10.0%	27	2	7.4%
Battambang	170	8	4.7%	83	2	2.4%	253	10	4.0%	61	7	11.5%	50	8	16.0%
Kampong Cham	122	2	1.6%	146	2	1.4%	268	4	1.5%	52	3	5.8%	51	1	2.0%
Kampong Chhang	137	2	1.5%	85	0	0.0%	222	2	0.9%	31	0	0.0%	50	1	2.0%
Kampong Speu	119	4	3.4%	131	1	0.8%	250	5	2.0%				75	0	0.0%
Kampong Thom	158	8	5.1%	90	0	0.0%	248	8	3.2%	30	0	0.0%	76	2	2.6%
Kampot	135	3	2.2%	140	3	2.1%	275	6	2.2%	72	1	1.4%	29	0	0.0%
Kandal	154	3	1.9%	54	3	5.6%	208	6	2.9%	30	2	6.7%	125	2	1.6%
Kep	231	2	0.9%				231	2	0.9%						
Koh Kong	35	8	22.9%	47	8	17.0%	82	16	19.5%						
Kratie	140	9	6.4%	130	18	13.8%	270	27	10.0%	30	1	3.3%	24	2	8.3%
Mondul Kiri	47	1	2.1%	166	0	0.0%	213	1	0.5%	29	0	0.0%	6	0	0.0%
Phnom Penh	248	2	0.8%				248	2	0.8%	495	38	7.7%	91	14	15.4%
Preah Vihear	77	0	0.0%	106	1	0.9%	183	1	0.5%	29	2	6.9%	7	0	0.0%
Prey Veng	30	1	3.3%	200	10	5.0%	230	11	4.8%	56	3	5.4%	99	5	5.1%
Pursat	136	6	4.4%	143	6	4.2%	279	12	4.3%	71	4	5.6%	50	7	14.0%
Ratanak Kiri	80	4	5.0%	121	1	0.8%	201	5	2.5%	30	1	3.3%	7	0	0.0%
Siem Riep	100	4	4.0%	104	5	4.8%	204	9	4.4%	20	0	0.0%	100	5	5.0%
Sihanouk Ville	278	8	2.9%				278	8	2.9%						
Stung Treng	84	5	6.0%	88	1	1.1%	172	6	3.5%				12	1	8.3%
Svay Rieng	87	0	0.0%	136	2	1.5%	223	2	0.9%	32	1	3.1%	76	2	2.6%
Takeo	57	3	5.3%	145	4	2.8%	202	7	3.5%	57	3	5.3%	80	2	2.5%