

## PREFACE

HIV epidemic has been alarmingly threatening the life and development in Cambodia. The first HIV positive case was reported to Ministry of Health in Cambodia in 1991. Until 1993, the first AIDS case was reported to Ministry of Health.

Since 1994, National AIDS program, Ministry of Health has started the HIV sentinel surveillance among target groups. By the end of April, 2000, National Center for HIV/AIDS, Dermatology and STDs (former National AIDS Program) has finished its six round of HIV sentinel surveillance.

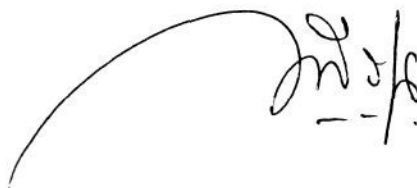
On the basis of available data, The National Center for HIV/AIDS, Dermatology and STDs, Ministry of Health estimated that by the end of 1999 Cambodia has approximately 170, 000 people living with HIV.

Two goals were identified for the sentinel surveillance system. First, was to gather and analyze additional HIV and AIDS epidemiological information. Second, was to elucidate the extent of the HIV epidemic in selected areas and among selected population groups. Surveillance data can make an important contribution to developing and implementing effective public health action, including advocacy, intervention design, and activity evaluation.

This document is developed to meet the need of National Institution and International Organization working on HIV/AIDS and having willingness to have an insight on HIV sentinel surveillance in 1999.

Finally on behalf of the National Center for HIV/AIDS, Dermatology and STDs, I greatly thank all those who contributed to the survey and without their help this study could not have been completed.

National Center for HIV/AIDS, STDs  
and Dermatology  
Director

A handwritten signature in black ink, appearing to be 'Mean Chhi Vun', with a long horizontal line extending to the left.

Dr Mean Chhi Vun

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- The local community leaders for their cooperation and help.
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## Executive summary of HSS 1999 in Cambodia

### Overall Trends

- As improvements have been made from year to year, the populations included and the sampling methodology of the HSS have changed, so it has been difficult to interpret change up to this point.
- Keeping in mind these difficulties, there appears to have been a relatively constant high level of HIV infection in a number of the populations surveyed since 1996.
- In all the 20 provinces surveyed in Cambodia in 1999, the prevalence is at levels that should be considered high.
- The prevalence observed across provinces have been particularly high in brothel sex workers (average 33.2%) and indirect sex workers (18.7%), but also relatively high in the police (4.7%), and antenatal women (2.6%).
- Within these overall high levels, there is some indication that the percentage of people with HIV infection in the 1999 survey is slightly lower than in 1998.
- This decline has been observed for a number of the sentinel groups in the survey, including brothel sex workers, police and antenatal women (for whom the comparison must be made with 1997, as this group was not included in 1998). There has also been a decline in HIV prevalence among blood donors.
- Of particular note the decline between 1998 and 1999 has been greatest in the proportion of young sex workers (age under 20) with HIV infection.
- Among people with tuberculosis, the percentage with HIV infection has increased substantially compared to 1997, the last year that this population was surveyed.
- Three independent sources of information in 1999 (household survey in 5 provinces, blood donor screening in Phnom Penh and surveillance in tuberculosis patients) indicate that the prevalence of HIV infection is about 50% higher in males than in females. Available data from 1997 led to the use of a higher ratio of male to female HIV prevalence, of about two-fold in the analysis of the 1998 HSS.

### Household survey results

- In the five provinces where household survey methods were pilot tested in 1999, there was a wide range in the rate of participation due to refusal, inability to contact, and other reasons.
- Overall HIV prevalence was slightly higher in males than females, and higher in provincial capitals than rural districts.
- These relationships were not consistent across the five provinces.
- Compared to the antenatal women in the five provinces, the household women had lower HIV prevalence, especially in the younger age group.
- Compared to police surveyed in the five provinces, the household men had a slightly lower HIV prevalence.
- These relationships again were not consistent across the five provinces.

## **Interpretation of 1999 HSS results**

- Among the brothel-based sex workers, who are the group at highest risk of HIV infection in Cambodia, there is an encouraging suggestion that the prevalence may have fallen.
- This finding is consistent with the results of the 1999 BSS, which showed steadily increasing levels of self-reported condom usage by both sex workers and their clients in the five provinces surveyed.
- Among the general population, the percentage who have HIV infection seems not to be increasing over the past 1-2 years, and may even have fallen slightly.
- Based on AIDS case reporting, the number of people developing advanced HIV-related illness has been increasing sharply each year, and the number of AIDS-related deaths has also increased. Therefore the finding of a relatively constant number of people with HIV infection from year to year indicates that the rate of new infections remains high.
- The apparent decrease in the ratio of male to female HIV prevalence suggests that the transmission of HIV infection is increasingly occurring from male to female in married couples, in addition to sex workers and their clients.
- The similar rate of HIV infection among police and household males suggest that police should not be considered to be a higher risk group than general population males

## **Estimation and projection of the number of people with HIV infection in Cambodia**

- There are many different methods that can be used to estimate the number of people living with HIV infection in Cambodia. As better methods and more data become available, new estimates become possible, and there may be revisions of data from previous years based on improved knowledge.
- The estimation method that was applied in both 1998 and 1999 used as its starting point the prevalence of HIV infection in women in the HSS who were considered to be drawn from the general population ("married women of reproductive age" in 1998 and antenatal women in 1999). The national estimate of the number of women with HIV infection was constructed taking account of province populations and age-adjustment. Prevalence in men was then estimated from the prevalence in women by applying the national ratio of male to female HIV prevalence (male prevalence divided by female prevalence).
- The estimated number of women with HIV infection was slightly higher in 1999 than in 1998, but the estimated number of men with HIV was lower, because the ratio of male to female HIV prevalence was considered to have declined over time from 1.75 to 1.5. It should be noted that the 1998 estimate of 1.75 represents a retrospective downward revision of the ratio compared to that actually applied in last year's estimation.
- In past years, projections of numbers of AIDS cases and other indicators have been made using EPIMODEL. Because new projection methods that take better account of the transmission patterns in countries with well-defined high-risk groups are likely to be available within a few months, it was decided to defer projections until later this year.

## **Recommendations for surveillance in 2000 and beyond**

- The highest priority for the HSS in coming years will be to maintain the stability and quality of the collection, analysis and reporting of survey data.
- The pilot household surveys carried out in 1999 yielded some crucially valuable information about the relative prevalence in various groups used in HSS, and the general population. The results should be analysed more comprehensively, and reported to the National Program and the wider public health community.
- For 2000, it is unlikely that another round of household surveys will produce new information of value beyond that obtained in 1999, unless extremely expensive expansion was made to the whole country. Therefore, this group should not be included in the 2000 HSS. Future consideration will be given to including the group on the basis of its potential role and scope in HSS.
- All other sentinel groups used in the 1999 survey should be maintained without change for the 2000 survey.
- In most respects, the protocols defined for the 1999 HSS appear to have been followed and documented. Further attention to the detail of implementation will ensure ongoing improvement in the quality of the HSS in all groups.
- Although there has been consistency since 1996 in the laboratory methods used for HIV testing in the HSS, it may be worth considering the implementation of further quality control mechanisms. These may include participation in an external network of testing validity, and the use of rapid tests on site in provinces for a random sample of specimens prior to their being sent to the national laboratory.

# I Background

This report presents the results of the 1999 round of sentinel HIV surveillance in Cambodia.

The 1999 round is the sixth in a series of annual surveys that have taken place in Cambodia, beginning in 1994. The surveys have been undertaken by the Cambodian Ministry of Health, through the National Centre HIV/AIDS, Dermatology and STD (NCHADS) and supported financially in various aspects by WHO, USAID (through Family Health International), French Cooperation and the World Bank.

The survey results have been reported each year, and the methodology has been subject to thorough reviews involving both national experts and external consultants. As a result of these reviews, the Ministry of Health has modified the design of the survey every year, to take account of any methodological recommendations made.

The review of the 1998 round was undertaken in several stages. First, NCHADS produced a report of the results, which was accompanied by a series of recommendations made by an external consultant (Dr R Detels, UCLA). A consensus workshop involving National and Provincial experts, donor organizations and collaborating agencies and external consultants was then held in March 1999, at which the results were presented, and a further set of recommendations emerged on the future conduct of the surveys. The consensus workshop report can be found at [www.nchads.org](http://www.nchads.org) (give website for 1998 report). The following is a summary of key issues and problems that arose in the discussion of the 1998 survey, and the actions that were proposed to address them in the 1999 survey.

## *Choice of sentinel groups and sampling frames*

A range of different sentinel groups have been used in past surveys, each with various advantages and disadvantages from the point of view of representativeness, repeatability and feasibility. The 1998 review recognized the need to ensure stability in the choice of groups, so that results could be compared from year to year, and recommended that explicit sampling protocols be developed for each sentinel group.

*Antenatal women/general community:* In the surveys that took place from 1994-97, antenatal women had been recruited to give an indication of the prevalence of HIV infection in the general community. The use of antenatal clinics for this purpose was questioned following the 1997 round by Dr J. Chin because of the relatively low proportion of antenatal women attending such clinics, particularly in rural areas. For the 1998 round, antenatal women were replaced by "married women of reproductive age", but this group proved difficult to identify in a systematic and repeatable way. For the 1999 round, it was therefore recommended that antenatal clinics be again used, but that they are selected from both the provincial capital and rural districts in each province. In addition, it was recommended that a pilot study be undertaken in 5 provinces of HIV surveillance through cluster-based household sampling of consenting adults.

*Female sex workers:* In past years, the selection of brothels for the sentinel surveys had been somewhat ad hoc, and focussed on provincial capitals. For the 1999 survey, an explicit sampling frame of brothels was drawn up and used to select participating brothels and workers. Another issue that arose after the 1998 survey was the definition of indirect (non-

brothel) sex workers, which was questioned because of the possible overlap with brothel-based workers, and the differences among various categories of indirect sex workers. For the 1999 survey, explicit sampling protocols were used to recruit beer promotion girls separately from bar and karaoke girls, who were considered more likely to have also worked in brothels.

*Police:* The 1997 survey had included both military and police, but because of substantial changes taking place in the military, the 1998 decision to only recruit police was maintained, using in 1999 an explicit sampling frame that involved both provincial capitals and rural districts.

*Tuberculosis and hospital patients:* To provide an indication of the burden of HIV-related disease and the impact on health services, as well as a basis for examining male-females ratios of HIV prevalence, the review of the 1998 survey recommended surveillance of tuberculosis patients in all provinces, and hospital in-patients in selected major cities.

*Blood donors:* The interpretation of HIV prevalence in blood donors as being representative of the general community has been problematic, because in past years, the reported rates have included paid donors who may have a higher prevalence. For the 1999 report, it was recommended that, for surveillance purposes, the Red Cross be asked to provide information on voluntary donors only.

### **Sample sizes and frequency of surveillance**

In past surveys, including 1998, there had been difficulties in attaining target sample sizes in some provinces. This problem was addressed for the 1999 survey by defining lower sample sizes for groups in provinces where the prevalence had previously exceeded specified levels. It was also proposed that high prevalence groups may not need to be surveyed every year in all provinces, and that a focus on younger people (e.g. under 20) in populations at high risk could provide a surrogate estimate of HIV incidence that would be of value for evaluating the impact of prevention.

### **Testing modality**

After the 1998 survey, there was considerable discussion about the use of alternative specimens, such as fingerprick (capillary) blood or saliva, instead of venous blood for HIV testing. The recommendation was made that pilot investigations explore the feasibility of using these specimens for the Cambodian surveillance program.

### **Statistical analysis and estimation**

The review of the 1998 survey recognised that a variety of statistical methods had been used to estimate the overall prevalence of HIV infection in Cambodia over successive years, resulting in problems of comparability. Also, prior to the analysis of the 1998 survey, the methods had generally not taken account of differences over time and across provinces in the age distribution and size of survey samples, and in the differences in populations of the provinces. The analysis of the 1998 survey that was presented for the consensus workshop represented the first attempt to address these issues in a systematic way, and it was proposed that they be incorporated routinely for the analysis of subsequent surveys.

## II Objectives

The **primary** objectives of the 1999 round of HIV surveillance were:

- to measure the prevalence of HIV infection in the selected sentinel population groups in each province
- to estimate the number of people living with HIV infection in Cambodia
- to use data from young populations to estimate incidence of HIV infection
- to use new information coming out of the HIV surveillance system to examine the evolving status of the epidemic. This involves deriving historical numbers of infections, and making short-term projections about the numbers of people who will become infected and develop advanced HIV-related illness (AIDS and other manifestations)

The **secondary** objectives of the 1999 round of HIV surveillance were:

- to examine the feasibility of conducting surveillance in household samples
- to collect HIV prevalence data on selected samples of general population men to provide insight into the sex ratio of infected males to females
- to determine whether there are multiple categories of indirect sex workers that are different from one another in terms of HIV prevalence (i.e. beer girls vs. freelance (defined as karaoke, massage and bar girls))
- to determine whether the so-called freelance sex workers are different from brothel-based sex workers in terms of HIV prevalence

## III. Methodology

### a. Scope and Coverage

It was recommended during the consensus workshop on HIV/AIDS in 1999 that round six of HIV sentinel surveillance in 1999 be conducted in all provinces. However, out of the 24 provinces, only 20 provinces were actually covered. This was due to issues of inaccessibility and small population sizes in the remaining four provinces.

In 1999 round of surveillance included the following eight target groups: 1) direct sex workers, 2) beer girls, 3) freelance sex workers, 4) police, 5) women attending antenatal clinics, 6) tuberculosis patients, 7) hospital inpatients, and 8) community males and females. As in previous years, not every group was done in every province. Groups 1-6 were done in all 20 provinces, with the exception of beer girls, where Koh Kong was excluded because of non-applicability, and freelance sex workers, where only 9 provinces were covered. Hospital patients were done in only 3 provinces. The household survey this year was done on a pilot basis in five provinces only.

*Direct female sex workers and police* were selected from the whole province, as opposed to from provincial towns only. This represents a departure from the methodology in previous years, which was done to provide a more representative baseline for the future, but which will necessitate cautious interpretation of changes in trends from the past.

*Indirect sex workers* were also redefined to explore the possible overlap with brothel sex workers. Rather than one big group, as in previous years, indirect sex workers were divided into two groups, beer girls and freelance sex workers. The latter included women from karaoke lounges, massage parlors and bars. *Note:* Beer girls were not sampled from Koh Kong

*ANC attenders and community males and females* were sampled separately in provincial towns and remaining districts. The sample of community males and females was drawn from the catchment areas that serve the ANC women on a pilot basis in five provinces only.

*Tuberculosis patients* included newly diagnosed TB patients from 19 provinces. Pailin was excluded because it is a newly structured municipality that does not have TB services yet. In the province of Rattanakiri, only four samples were obtained, so this province was dropped from the analysis.

*Hospital inpatients* were sampled separately from surgery and medical wards in the same three provinces that were used in 1998. Only three provinces were included once the epidemic has been firmly established in the general population, it is not necessary to use hospital patients as an early indicator of the presence of HIV in the country.

## **b. Organization of the survey**

The survey was organized by the National Center for HIV/AIDS, Dermatology and STD Control (NCHADS). In each province, the survey was managed by the AIDS program manager, who functioned as the team leader, and was responsible for implementing the survey in his/her own province. Each province also had a surveillance officer directly in charge of implementing the survey. All work was done under the supervision of the national surveillance unit.

A pre-surveillance workshop for the provincial survey team was held at NCHADS in Phnom Penh in September, 1999, before the actual survey began, to provide technical and management support. All provincial program managers and surveillance officers were invited to join the workshop. The material for sera collection was distributed to the provincial participants during the workshop, and other necessary materials were sent to the provinces later.

The national supervisory team conducted field tests in provinces where the community sample was to be drawn, since the survey and sampling methodology were new.

## **c. Survey design**

A serial cross-sectional design was used which allowed for repeat prevalence measures to determine HIV trends. Blood samples were drawn in an anonymous fashion, specifically for the purpose of testing for HIV. Selected subjects were informed of the intent of the survey, and oral consent was obtained from each subject prior to drawing blood. Study subjects were not given the option of obtaining the results of their HIV test.

## **d. Sample size and sampling design**

The sample sizes per province were calculated in advance by the surveillance unit of NCHADS.



- Brothel-based sex workers: 150
- Beer-girls: 100
- Freelance CSWs: 150 in provinces where HIV prevalence was above 5% in previous years, 300 in provinces where HIV prevalence was below 5%. (In reality, a take-all sample was used in most provinces because not enough women were available to reach the total sample size)
- Male Police: 150 in provinces where HIV prevalence was above 5% in previous years, 300 in provinces where HIV prevalence was below 5%.
- ANC women: 300 in provincial capitals and 300 in remaining districts
- Women aged 15-49 sampled from households: 300 in provincial capitals and 300 in remaining districts
- Men aged 15-49 sampled from households: 300 in provincial capitals and 300 in remaining districts
- TB Patients: 150 in provinces where prevalence was above 5% in previous years, 300 in provinces where HIV prevalence below 5%
- Hospital in-patients: 100-150 for medical wards and 250 for surgery wards

A two-stage cluster design was planned to obtain probability samples for brothel-based sex workers, beer girls, freelance sex workers, and police, and a three-stage cluster design was used for community males and females. ANC attendees and TB and hospital patients were done on a convenience basis, using consecutive sampling. Explicit details of the design may be found in the Supervisor's Field Manual for HSS Round VI, 1999. A brief description follows of the final methodology that was actually used for selected groups:

*Brothel based sex worker, beer girls and freelance sex workers* - Although a two stages cluster design with clusters being chosen by probability proportional to size at the first stage, and women being randomly selected from each cluster at the second stage was planned, in most provinces, all sex workers were recruited (i.e. a "take-all" approach was used), because of limited numbers of target groups members

**Police:** A two-stages cluster design was used with some provinces selecting clusters by PPS and others with equal probability. At the second stage a fixed number of ten police were randomly chosen from each selected cluster.

**Community males and females:** The household sample was designed to be a self-weighted probability sample, using a three stages cluster design. Clusters within villages were selected by probability proportional to size at the first stage, equal sized segments of households within villages were selected by equal probability at the second stage, and all eligible respondents in selected segments were selected at the third stage. Four separate samples were drawn, one each for males and females from provincial towns and for males and females in remaining districts. A field test was conducted ahead of time to determine the number of eligible respondents that could be expected from segments of ten households. Eligible respondents included both residing and non-residing males and females. Since a "take-all" approach was used for each segment, the sample size was inflated ahead of time to account for the percent of non-residing residents. During the actual survey, for *residing* residents who were not at home, three call-backs were supposed to be carried out, in order to minimize the bias that could result by skipping the people who happened not to be at home when the survey team arrived. Although this was planned in theory, it turned out not to be feasible in reality. This is discussed further in the section on limitations. Informed consent

was obtained from those respondents who could be contacted, and refusal rates were recorded.

#### e. Data collection

After returning from the pre-sentinel surveillance workshop, each province prepared the sampling frames for each target group, which involved listing all possible sites where target group members could be accessed for the survey. Informal training were conducted in each province by the AIDS program managers. Some program managers invited their staff to join a meeting at the provincial level, and others went directly to the district concerned and provided technical assistance to the district staff. All staff involved in the survey from provincial and district levels were required to be qualified to collect blood and code and record the requisite information needed to accompany the samples collection of sample at the district level was supervised by provincial or national staff.

#### f. Processing of specimens

##### **District level/Provincial Level**

Five ml of blood were collected for HIV testing from each individual using universal precaution (disposable syringe, Gloves, Cotton, Alcohol, etc.). When the blood was collected, information on Age, Gender, Year of school and marital status was also recorded. After the specimens were collected, They were stored in vacutainer tubes labeled with unique code numbers. If freezer is available at the district level, then all sera were accumulated. In most cases, however, freezers were not available, So sera were stored in cooler and sent to provincial laboratory within 24 hours.

At the provincial level, Collected blood specimens were processed and sera were stored in the freezer, or are freezer was not available in cooler box with ice. Subsequently they were picked up by supervisory team and sent to NCHADS to be stored before testing. A cooler box with ice was used transporting the sera from the province to Phnom Penh. Sera were supposed to reach Phnom Penh within 24 hours after departure from the province. The final sample reached Phnom Penh by February 2000.

##### **Processing**

Processing consisted of storing the blood specimen at room temperature in vacutainers for three to four hours (if centrifuge was not available) until cells and sera separated. Sera were then transferred to cryotubes by using a separate Pasteur pipette. The cryotubes were labeled with the same unique code number as the vacutainers.

##### **National Level**

AT NCHADS, Once sera were ready for testing, they were sent to the National Lab. The particle agglutination assay (Serodia HIV 1 / 2 ) was used to screen all the samples. Positive samples were further tested by the same particle agglutination assay. Sera positive to both particle agglutination tests were confirmed by enzyme-linked immuno sorbent assay (Geneslavia mixt HIV 1 / 2). The results of the tests were marked on the same sheet for the particle agglutination and EIA assay.

## IV. Estimation of the National prevalence

**Time trend analysis:** When comparisons of prevalence over time within specific sentinel groups was carried out, it was necessary to

- Adjust for differences in the age distribution of populations surveyed in different province.
- Reflect the composition of populations across provinces in a consistent manner.

The method of direct standardization was used to achieve these three goals, in ways that differed somewhat across the various sentinel groups.

*Sex workers:* For each year, the national prevalence of HIV infection in sex workers was calculated by dividing the total number of specimens that tested positive, by the total number of specimens tested.

This analysis was carried out separately for direct sex workers, indirect sex workers, and for direct and indirect sex workers aged under 20 years old.

*Police:* The analysis for police was carried out in the same way as for sex workers.

*Antenatal women (married women of reproductive age in 1998):* For each year and each province, an age-adjusted HIV prevalence for women aged 15-49 was calculated using two age groups, group 1=15-29 and group 2=30-49. The age-adjusted rate was calculated as  $w_1r_1 + w_2r_2$ , where  $w$  is the proportion of the women in the Cambodian population aged 15-49 who are in the age group based on the 1998 census, and  $r$  is the observed prevalence in the age group. For example, if the prevalence is 2% in the younger age group and 3% in the older group, and the two age groups represent .55 and .45 of the total population in the age group, then the age-adjusted prevalence is  $2 \times 0.55 + 3 \times 0.45 = 2.45\%$ . For each year, the age adjusted rates were calculated for each province. The national prevalence for that year was then obtained, by taking the age-adjusted rate for each province, multiplying it by the proportion of women aged 15-49 in Cambodia who live in the province, and adding up all of these products over all provinces.

## V. National estimate of number of people living with HIV infection

The estimated number of women aged 15-49 with HIV infection in each province was obtained by multiplying the age-adjusted prevalence among antenatal women in the province by the total number of women in the province aged 15-49. The estimated number of men aged 15-49 with HIV infection in the province was obtained by multiplying the sex ratio factor by the age-adjusted prevalence among antenatal women in the province, and then multiplying the result by the total number of men in the province aged 15-49. The sex ratio used in 1998 was 2.0. For 1999, the sex ratio was based on the relative prevalence of HIV infection in male and female tuberculosis patients, hospital patients and blood donor, which was about 1.5. The sex ratio for 1998 was recalculated as 1.75 on the basis of information available in 1999 and the ratio in 1997

## VI. RESULTS

The results of the 1999 National HIV Surveillance are given in Tables 1-7. The trends in prevalence are shown in Figures 3-7

Table 1 presents the provinces in which sentinel surveillance was conducted from 1992-1999 and also presents the sentinel groups included in each year. The number of provinces and the specific sentinel groups included varied from year to year. In 1999 sentinel surveillance was conducted in the 20 provinces shown in Figure 1. Three provinces were excluded because of logistic difficulties associated with the remoteness and difficult terrain of the province. The sentinel groups included in the 1999 sentinel surveillance included direct commercial sex workers (DCSW), beer promotion girls (BEG) in 19 province, police (POL), women attending antenatal clinics (ANC), freelance commercial sex workers in ten provinces (FRL), patients in TB clinics in 19 provinces (TB), men and women in households in five provinces including Battambang, Kampong Cham, Kompot, Kratie, and Takeo (HH), and hospital patients in two provinces (Battambang and Kompang Cham) and one capital city (Phnom Penh).

Figure 2 presents the seroprevalence of HIV in each of the sentinel groups for all the provinces combined. The prevalence ranged from a high of 33.2% among direct commercial sex workers to 1.2% among household females.

Table 2 presents the summary prevalence rates in each of the sentinel groups for all the provinces combined from 1992 through 1999. Table 3a and 3b present the age specific rates by sentinel group for 1999. The HIV seroprevalence in each sentinel group in each province and the crude prevalence across all provinces is shown in Tables 4a and 4b. Crude prevalence rate ranged from as low as 1.2% among household females (from 5 province only), up to 33.2% among direct sex worker, Beer girl and freelance sex worker between 16-20%, Police were 4.7% and ANC women around 2.6%.

The prevalence of HIV was compared between household males and police and between household females and antenatal clinic attendees in the five provinces in which the household surveys were conducted. The prevalence among policemen (4.7%) was only slightly higher than the prevalence among household males (1.8%). The difference was not statistically significant ( $p=0.48$ ). The prevalence of HIV among the antenatal clinic attendees 2.6%, however, was higher than among the household women 1.2% this difference had borderline significance ( $P<0.07$ ). The difference reached significance among the group of ANC and household women who were 15-29 years. ( $P<0.05$ ). The prevalence of HIV among household males in provincial capitals (2.0%) was not significantly different than among household males in the rural areas (1.5%) nor was the difference among women in the provincial capitals (1.6%) significantly different than the prevalence among women in the rural areas (0.9%). The difference in prevalence between ANC women was significantly different between women attending clinics in the provincial capitals (3.0%) versus the rural areas (2.0%), ( $P<0.001$ ).

The trends of HIV prevalence in the sentinel groups are shown graphically in Figures 3-7. The prevalence rate among DCSWs was lower in 1999 than in 1998 (Figure 3a), but the decline was greatest among the commercial sex workers less than 20 years old Figure 3b. A similar but smaller decline was observed among the policemen which was also greater among the younger than the older policemen (Figures 4a and 4b). The rates among indirect sex workers (beer girls plus freelance sex workers) were similar in 1998 and 1999 (Figure 5). Antenatal clinic attendees were not included in the 1998 sentinel surveillance. The trend in seroprevalence of HIV among non-commercial blood donors is shown in Figure 6. Voluntary blood donors were not a sentinel groups but provide a reasonable estimate of the prevalence in the general population. The highest prevalence, 4.47%, was reached in 1995 and the trend has declined steadily since then except in 1998. The prevalence in 1999 was 3.1%.

The trend in the rates of HIV among TB patients increased steadily from 1995 to 7.9% in 1999 (Figure 7). The trend in prevalence of AIDS cases and incidence of AIDS deaths from 1993-1999 reported by the National Center for HIV/AIDS, Dermatology and Sexually Transmitted Diseases is shown in Figure 8. There has been a sharp, steady increase in the prevalence of AIDS cases since 1995 and a steady increase in AIDS deaths. In 1999 there were 2,556 AIDS cases and 374 AIDS deaths reported.

Table 5 provides the province specific data for each of the sentinel groups in each year in which surveillance was done in that sentinel group in that province. Table 6 provides the prevalences and confidence intervals for each sentinel group from 1995 through 1999 across all the provinces in which surveillance was done in that year.

Table 7 illustrates the HIV prevalence ratios between men and women in various groups that provide a proxy for general population. These include TB patients, hospital patients and household males and females, as well as ANC women. Based on data from these groups, the HIV prevalence ratio by sex is estimated to be about 1.5.

The HIV prevalence in the sexually active population of Cambodia (illustrated in figure9) was estimated for 1996-99 in following ways. Using the prevalence of HIV in antenatal women aged 15-49 as the base, the age-adjusted prevalence was calculated for each province and applied to the population of females age 15-49 from the province to estimate the number of HIV infection among females in the province. Then, using the appropriate HIV prevalence ratio for males to females in the year in question, an age adjusted prevalence rate was calculated for males, and applied to male population aged 15-49 for the province. The number of infections for both males and females was then summed across the provinces, and divided by the total population aged 15-49 for the country. In 1998, since there were not data from ANC women, the estimates for that year were based on HIV samples taken from married women in the community. The estimated prevalence peaked in 1997 at 4.55% and then steadily declined to 3.2% in 1999. Using the estimated prevalence of HIV among men and women aged 15-49 in Cambodia, the number of HIV infected persons in Cambodia in 1999 was estimated to be 170,000.

**Table 1. Summary of Changes of the Sentinel sites and groups of the National HIV Surveillance System in Cambodia from 1992-1999**

YEAR	1992	1993	1994	1995	1996	1997	1998	1999
Provinces	PNP	No survey	BMC BTB PNP SHV SRP	BMC BTB KDL KHK PNP PUR RTK SRP SHV	BMC BTB KCM KCN KSP KPT KDL KHK KRT PNP PV PUR SRP STG SVR SHV TKO RTK	BMC BTB KCM KCN KSP KTH KPT KDL KEP KHK KRT MDK PNP PVH PVG PUR SRP STG SVR SHV TKO RTK	PNP BMC BTB SHV SRP KDL KHK PST RTK KCM KCN KPT KRT KSP PVG STG SVG TKO	BMC BTB KCM KCN KSP KTH KPT KDL KHK KRT PAL PNP PVG PUR RTK SRP SHV STG SVG TKO
Sentinel group	-DCSW -TB -POL -MIL -ANC -STD		-DCSW -TB -POL -MIL -ANC	-DCSW -TB -POL -MIL -ANC -IDCSW	-DCSW -TB -POL -MIL -ANC	-DCSW -TB -POL -MIL -ANC -HIPN	-DCSW -POL -MWRA -IDCSW -HIPN	-DCSW -BEG -POL -ANC -FRL -TB -HH -HIPN

**NOTE:**

- DCSW: Direct Commercial Sex Workers
- TB: Tuberculosis patients
- POL: Police personnel
- MIL: Military personnel
- ANC: Antenatal Clinic Attendees
- STD: Sexually Transmitted Diseases patient
- IDCSW: In-Direct Commercial Sex Workers
- MWRA: Married Women of Reproductive Age
- HIPN: Hospital In-Patients
- BEG: Beer Girl
- FRL: Freelance
- HH: Household
- BMC: Banteay MeanChey
- BTB: Battambang
- KCN: Kampong Chhnang
- KSP: Kampong Speu
- KTH: Kappong Thom
- KPT: Kampot
- KDL: Kandal
- PNP: Phnom Penh
- PUR: Pursat
- RTK: Rattanakiri
- SRP: SiemRiep
- SHV: Sihanouk Ville
- STG: Stung Treng
- SVG: Svay Rieng
- TKO: Takeo
- PVH: Preah Vihea
- MDK: Mondul Kiri
- KEP: Kep
- KCM: Kampong Cham
- PVG: Prey Veng
- KRT: Kratie
- KHK: Koh Kong

**Table 2: Summary of all national HIV prevalence rates in sentinel groups across all provinces combined 1992-1999**

Target groups	Year											
	1992		1994		1995		1996		1997		1998	
	N. tested	%	N. tested	%	N. tested	%	N. tested	%	N. tested	%	N. tested	%
DCSWs	207	9	213	39	1007	38	1859	40.9	1132	39.3	2284	42.6
Tuberculosis patients	N/A		N/A		602	2.5	1826	3.9	1035	5	N/A	
Police personnel	240	0	N/A		954	8	1775	5.5	1325	6	2650	6.2
Military personnel	200	0	N/A		1013	5.9	1429	5.9	1249	7.1	N/A	
ANC Attendees	195	0	N/A		870	2.6	3429	1.7	5003	3.2	N/A	
STDs patients	805	4	1072	9	N/A		N/A		N/A		N/A	
IDCSWs	N/A		N/A		549	25.3	N/A		N/A		1358	19.1
Hospital in patients	N/A		N/A		N/A		N/A		1155	6	1173	12.2
MWRA	N/A		N/A		N/A		N/A		N/A		8879	2.4
Household Male	N/A		N/A		N/A		N/A		N/A		N/A	
Households female	N/A		N/A		N/A		N/A		N/A		N/A	
											3069	1.8
											3066	1.2

NA: not available



**Table3a: HIV seroprevalence by age, Gender and location in selected populations in 20 provinces in 1999**

Total		Gender		Age Group (year)									
		Male	Female	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Groups													
DCSW	Sample	2259		2259	1	622	1091	378	109	43	10	3	2
	Posit.	751		751	0	162	382	149	37	16	4	1	0
	Prev.	33.2%		33.2%	0.0%	26.0%	35.0%	39.4%	33.9%	37.2%	40.0%	33.3%	0.0%
Beer Girl	Sample	931		931	1	239	449	210	26	5	1	0	0
	Posit.	184		184	0	41	95	47	1	0	0	0	0
	Prev.	19.8%		19.8%	0.0%	17.2%	21.2%	22.4%	3.8%	0.0%	0.0%	0.0%	0.0%
Freelance	Sample	557		557		168	259	93	35	2	0	0	
	Posit.	93		93		30	49	15	3	1	0	0	
	Prev.	16.7%		16.7%		17.9%	18.9%	16.1%	8.6%	50.0%	0.0%	0.0%	
Police	Sample	2166	1109	1057		66	111	168	238	296	314	278	695
	Posit.	194	194			0	5	43	59	51	15	15	6
	Prev.	4.7%	4.7%			0.0%	2.7%	5.6%	5.1%	5.3%	2.9%	3.9%	4.2%
ANC	Sample	3388		3388		361	1030	919	655	318	88	17	
	Posit.	102		102		16	27	31	15	10	3	0	
	Prev.	3.0%		3.0%		4.4%	2.6%	3.4%	2.3%	3.1%	3.4%	0.0%	
RD	Sample	2009		2009		197	598	483	363	247	104	17	
	Posit.	41		41		5	13	11	6	2	2	2	
	Prev.	2.0%		2.0%		2.5%	2.2%	2.3%	1.7%	0.8%	1.9%	11.8%	
TB	Sample	2166	1109	1057		66	111	168	238	296	314	278	695
	Posit.	172	105	67		1	9	27	22	39	22	18	34
	Prev.	7.9%	9.5%	6.3%		1.5%	8.1%	16.1%	9.2%	13.2%	7.0%	6.5%	4.9%

Posit.:Positive  
Prev.:Prevalence

DCSW:Direct Commercial Sex Worker  
ANC:Antenatal clinic attendees

TB:Tuberculosis patient



**Table3b: HIV seroprevalence by age, Gender and location in selected populations in selected provinces in 1999**

Total			Gender		Age Group (year)									
			Male	Female	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Groups														
HHM	PC	Sample	1513	1513		368	219	196	214	214	148	154		
		Posit.	30	30		4	6	2	13	1	3	1		
		Prev.	2.0%	2.0%		1.1%	2.7%	1.0%	6.1%	0.5%	2.0%	0.6%		
HHM	RD	Sample	1556	1556		355	307	261	207	200	132	94		
		Posit.	24	24		2	1	7	5	5	4	0		
		Prev.	1.5%	1.5%		0.6%	0.3%	2.7%	2.4%	2.5%	3.0%	0.0%		
HHF	PC	Sample	1538		1538	310	200	190	270	229	182	157		
		Posit.	24		24	2	3	3	2	8	4	2		
		Prev.	1.6%		1.6%	0.6%	1.5%	1.6%	0.7%	3.5%	2.2%	1.3%		
HHF	RD	Sample	1528		1528	296	222	253	268	196	187	106		
		Posit.	14		14	2	2	2	2	3	2	1		
		Prev.	0.9%		0.9%	0.7%	0.9%	0.8%	0.7%	1.5%	1.1%	0.9%		
Hospital in Patient		Sample	1061	613	448	7	121	127	132	163	158	111	85	157
		Posit.	117	62	55	0	7	9	19	27	26	17	5	7
		Prev.	11.0%	10.1%	12.3%	0.0%	5.8%	7.1%	14.4%	16.6%	16.5%	15.3%	5.9%	4.5%

HHM: household male & HHF household female were sampled in five province: Battambang, Kampong Cham, Kampot, Kratie and Kampong Cham  
Hospital in Patient were sample in 3 province: Phnom Penh, Battambang and Kampong Cham

**Table 4a: HIV Seroprevalence among target populations in 1999 in Cambodia**

N0	PROVINCE	Direct sex workers			Beer Girl			Freelance			ANC						Police			TB					
											PC			RD			PC+RD								
		Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.	Test.	Posi.	Prev.			
1	Banteay Meanchey	148	75	50.7%	40	4	10.0%	86	30	34.9%	106	3	2.8%				106	3	2.8%	150	9	6.0%	149	18	12.1%
2	Battambang	161	57	35.4%	101	21	20.8%				202	4	2.0%	172	2	1.2%	374	6	1.6%	160	7	4.4%	120	14	11.7%
3	Kampong Cham	157	44	28.0%	100	29	29.0%	100	14	14.0%	300	7	2.3%	266	13	4.9%	566	20	3.5%	301	9	3.0%	179	13	7.3%
4	Kampong Chhang	130	55	42.3%	47	12	25.5%				151	2	1.3%	150	6	4.0%	301	8	2.7%	298	11	3.7%	149	6	4.0%
5	Kampong Speu	96	29	30.2%	20	2	10.0%				200	4	2.0%	65	0	0.0%	265	4	1.5%	300	6	2.0%	135	3	2.2%
6	Kampong Thom	78	23	29.5%	36	9	25.0%	15	6	40.0%	150	2	1.3%	100	3	3.0%	250	5	2.0%	294	8	2.7%	100	9	9.0%
7	Kampot	56	29	51.8%	47	5	10.6%				126	1	0.8%	129	3	2.3%	255	4	1.6%	155	2	1.3%	101	14	13.9%
8	Kandal	104	33	31.7%	52	9	17.3%	48	7	14.6%	300	9	3.0%				300	9	3.0%	150	11	7.3%	151	13	8.6%
9	Koh Kong	151	63	41.7%				23	11	47.8%	100	8	8.0%				100	8	8.0%	150	36	24.0%	14	1	7.1%
10	Kratie	102	23	22.5%	35	8	22.9%				100	0	0.0%	100	0	0.0%	200	0	0.0%	303	5	1.7%	56	7	12.5%
11	Pailin	110	12	10.9%	8	1	12.5%	61	2	3.3%	156	3	1.9%	25	3	12.0%	181	6	3.3%	162	9	5.6%			
12	Phnom Penh	154	73	47.4%	110	7	6.4%	100	7	7.0%	511	25	4.9%				511	25	4.9%	153	13	8.5%	150	21	14.0%
13	Prey Veng	150	11	7.3%	100	31	31.0%				90	1	1.1%	100	3	3.0%	190	4	2.1%	150	6	4.0%	100	3	3.0%
14	Pursat	100	52	52.0%	17	4	23.5%				101	3	3.0%	202	3	1.5%	303	6	2.0%	299	12	4.0%	78	11	14.1%
15	Ratanak Kiri	32	15	46.9%	32	5	15.6%				99	1	1.0%	84	1	1.2%	183	2	1.1%	98	1	1.0%			
16	Siem Riep	150	27	18.0%	30	7	23.3%	70	9	12.9%	200	14	7.0%	100	0	0.0%	300	14	4.7%	150	14	9.3%	100	9	9.0%
17	Sihanouk Ville	150	63	42.0%	82	15	18.3%				100	6	6.0%	100	0	0.0%	200	6	3.0%	150	23	15.3%	48	9	18.8%
18	Stung Treng	55	16	29.1%	14	0	0.0%				100	2	2.0%	63	0	0.0%	163	2	1.2%	152	0	0.0%	35	1	2.9%
19	Svay Rieng	92	24	26.1%	7	1	14.3%	54	7	13.0%	146	6	4.1%	203	3	1.5%	349	9	2.6%	266	8	3.0%	200	7	3.5%
20	Takeo	83	27	32.5%	53	14	26.4%				150	1	0.7%	150	1	0.7%	300	2	0.7%	300	4	1.3%	301	13	4.3%
	Total	2259	751	33.2%	931	184	19.8%	557	93	16.7%	16.7%	102	3.0%	2009	41	2.0%	5397	143	2.6%	4141	194	4.7%	2166	172	7.9%

**Table4.b: HIV Seroprevalence in General populations group in 1999 Cambodia**

N0	PROVINCE	Household Male												Household Female												Hospital inpatient						
		PC				RD				PC+RD				PC				RD				PC+RD										
		Test.	Posi.	Prev.		Test.	Posi.	Prev.		Test.	Posi.	Prev.		Test.	Posi.	Prev.		Test.	Posi.	Prev.		Test.	Posi.	Prev.		Test.	Posi.	Prev.		Test.	Posi.	Prev.
2	Battambang	319	13	4.1%		309	8	2.6%		628	21	3.3%		329	5	1.5%		319	3	0.9%		648	8	1.2%		372	54	14.5%				
3	Kg Cham	300	5	1.7%		302	6	2.0%		602	11	1.8%		301	5	1.7%		301	2	0.7%		602	7	1.2%		289	21	7.3%				
7	Kampot	302	8	2.6%		309	2	0.6%		611	10	1.6%		303	9	3.0%		301	5	1.7%		604	14	2.3%								
10	Kratie	297	2	0.7%		309	4	1.3%		606	6	1.0%		302	3	1.0%		307	1	0.3%		609	4	0.7%								
20	Takeo	295	2	0.7%		327	4	1.2%		622	6	1.0%		303	2	0.7%		300	3	1.0%		603	5	0.8%								
12	Phnom Penh																								400	42	10.5%					
Total		1513	30	2.0%		1556	24	1.5%		3069	54	1.8%		1538	24	1.6%		1528	14	0.9%		3066	38	1.2%		1061	117	11.0%				

Table 5.1

## Province specific surveillance data

Province: Banteay Meanchey		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)			
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
<b>Direct Sex workers</b>										
Age <20	148	75	50.7%	42.7-58.8	3.22%	45.75%	54.49%	58.08%	53.96%	50.70%
Age 20-29	35	15	42.9%							
Age >=30	113	60	53.1%							
	0	0	0.0%							
<b>* Beer Girls</b>	40	4	10.0%	0.7-19.3	NA	31.25%			22.34%	10.00%
<b>** Freelance Sex Workers</b>	86	30	34.9%	24.8-45.0						
<b>Police</b>										
Age <30	50	0	0%							
Age 30-49	94	8	8.5%							
Total (including 50-69)	150	9	6.0%	2.2-9.8	0%	4.44%	11.76		10.00%	6.00%
<b>ANC PC= 1 sites</b>	106	3	2.8%	0.3-5.9	X					
<b>ANC RD= sites</b>	106	3	2.8%	0.3-5.9	X	1.53%	1.69	3.80%	0.24%	2.80%
<b>ANC (PC+RD)</b>	74	3	4.1%		X					
Age 15-29	32	0	0.0%							
Age 30-49	74	14	18.9%	10.0-27.8						
<b>TB Patients Male</b>	75	4	5.3%	0.2-10.4						
<b>TB Patients Female</b>	149	18	12.1%	6.8-17.3	0%	0.00%	2.98	7.41%		12.10%
<b>TB Patient Male + Female</b>	392	9	2.3%	0.8-3.8						
<b>Blood donor</b>										

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5.2a

## Province specific surveillance data

Province: Battambang		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)			
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
<i>Direct Sex workers</i>										
Age <20	161	57	35.4%	28.0-42.8	23.61%	48.00%	58.33%	47.06%	53.33%	35.40%
Age 20-29	35	4	11.4%							
Age ≥30	114	50	43.9%							
	12	3	25.0%							
<i>* Beer Girls</i>	101	21	20.8%	12.9-28.7	46.52%	29.20%			20.39%	20.80%
<i>** Freelance Sex Workers</i>										
<i>Police</i>										
Age <30	34	2	5.9%							
Age 30-49	122	4	3.3%							
Total (including 50-69)	160	7	4.4%	1.2-7.58.0	36.32%	9.74%	11.63%	8.73%	5.26%	4.40%
<i>TB Patients Male</i>	69	9	13.0%	5.1-20.9						
<i>TB Patients Female</i>	51	5	9.8%	1.6-17.6						
<i>TB Patient Male + Female</i>	120	14	11.7%	5.9-17.4	8.39%	3.45%	5.13%	16.00%	11.48%	11.70%
<i>Hospital Patients:</i>	372	54	14.5%	10.9-18.1	14.31%				18.41%	14.50%
<i>Medical Male</i>	91	21	23.1%	14.4-31.7						
<i>Female</i>	98	19	19.4%	11.6-27.2						
<i>Surgical Male</i>	120	12	10.0%	4.6-15.4						
<i>Female</i>	63	2	3.2%	1.1-7.5						

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* Confidential interval only on total for each group no age specific

Table 5.2b

**Province specific surveillance data**  
**General population groups**

Province: Battambang		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group		Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
ANC PC= 2 sites		202	4	2.0%	0.1-3.1	10%					
ANC RD= 4 sites		172	2	1.2%	0.4-2.8	23.45%					
ANC (PC+RD)		374	6	1.6%	0.3-2.9		2.00%	4.44%	3.95%	3.25%	1.60%
	Age 15-29	226	4	1.8%							
	Age 30-49	148	2	1.4%							
Household women(PC)		329	5	1.5%	0.2-2.8	50%					
Household women(RD)		319	3	0.9%	0.1-1.9	19%					
Household women (PC+RD)		648	8	1.2%	0.4--2.0						
	Age 15-29	305	3	1.0%							
	Age 30-49	343	5	1.5%							
Household Male (PC)		319	13	4.1%	1.9-6.2	59.92%					
Household Male (RD)		309	8	2.6%	0.8-4.4	NA					
Household Male (PC+RD)		628	21	3.3%	1.9-4.7						
	Age 15-29	365	11	3.0%							
	Age 30-49	263	10	3.8%							
Blood donor		2053	98	4.8%	3.9-5.7						

\* PC: Provincial Capital

\* RD: Remaining District



Table 5.3a

## Province specific surveillance data

Province: Kampong Cham		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal		1995	1996	1997	1998	1999
<i>Direct Sex workers</i>	157	44	28.0%	21.0-35.0	32%			27.27%		28.00%	28.00%
	Age <20	9	17.0%								
	Age 20-29	31	33.7%								
	Age ≥30	4	33.3%								
<i>* Beer Girls</i>	100	29	29.0%	20.1-37.9	32%					8.00%	29.00%
<i>** Freelance Sex Workers</i>	100	14	14.0%	7.2-20.8	65%						
<i>Police</i>											
Age <30	67	2	3.0%								
Age 30-49	221	7	3.2%								
Total(including 50-69)	301	9	3.0%	1.1-4.9	NA			3.11%	1.79%	3.33%	3.00%
<i>TB Patients Male</i>	90	7	7.8%	2.3-13.3							
<i>TB Patients Female</i>	89	6	6.7%	1.5-11.8							
<i>TB Patient Male + Female</i>	179	13	7.3%	3.5-11.1	NA			3.39%	1.96%		7.30%
<i>Hospital Patients:</i>	289	21	7.3%	4.3-11.3	NA				5.77%	6.47%	7.60%
<i>Medical Male</i>	55	4	7.3%	0.4--14.2							
<i>Female</i>	52	8	15.4%	5.6-25.2							
<i>Surgical Male</i>	121	6	5.0%	1.1-8.9							
<i>Female</i>	61	3	4.9%	0.5-10.3							

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* Confidential interval only on total for each group no age specific

Table5.3b

# Province specific surveillance data

## General population groups

Province: Kampong Cham		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)			
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
ANC PC= 1 sites	300	7	2.3%	0.6-4.0	3.33%					
ANC RD= 2 sites	266	13	4.9%	2.3-7.5	0%					
ANC (PC+RD)	566	20	3.5%	1.1-5.0			0.86%	1.49%	3.25%	3.50%
Age 15-29	423	15	3.5%							
Age 30-49	143	5	3.5%							
Household women(PC)	301	5	1.7%	0.2-3.2	NA					
Household women(RD)	301	2	0.7%	0.2-1.6	NA					
Household women (PC+RD)	602	7	1.2%	0.3-2.1						
Age 15-29	304	4	1.3%							
Age 30-49	298	3	1.0%							
Household Male (PC)	300	5	1.7%	0.2-3.2	23%					
Household Male (RD)	302	6	2.0%	0.4 -3.6	15.33%					
Household Male (PC+RD)	602	11	1.8%	0.7-2.8						
Age 15-29	355	5	1.4%							
Age 30-49	247	6	2.4%							
Blood donor	880	4	0.5%	3.6-6.4						

\* PC: Provincial Capital

\* RD: Remaining District



Table 5.4

## Province specific surveillance data

Province: Kampong Chhnang		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)			
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
<i>Direct Sex workers</i>										
Age <20	130	55	42.3%	33.8-50.8	0%			43.85%	39.33%	42.30%
Age 20-29	24	7	29.2%							
Age ≥30	88	40	45.5%							
	18	8	44.4%							
<i>* Beer Girls</i>	47	12	25.5%	13.0-38.0	31.88%				13.64%	25.50%
<i>** Freelance Sex Workers</i>										
<i>Police</i>										
Age <30	67	3	4.5%							
Age 30-49	224	8	3.6%							
Total (including 50-69)	298	11	3.7%	1.6-5.8	0%		3.51		2.00%	3.70%
<i>ANC PC= 1 sites</i>	151	2	1.3%	0.5-3.1	0%					
<i>ANC RD= 4 sites</i>	150	6	4.0%	0.9-7.1	0%					
<i>ANC (PC+RD)</i>	301	8	2.7%	0.9-4.5				0.90%	1.50%	2.70%
Age 15-29	181	5	2.8%							
Age 30-49	120	3	2.5%							
<i>TB Patients Male</i>	75	4	5.3%	0.2-10.4						
<i>TB Patients Female</i>	74	2	2.7%	0.1-6.4						
<i>TB Patient Male + Female</i>	149	6	4.0%	0.8-7.1	0%		1.72	2.00%		4.00%
<i>Blood donor</i>	860	23	2.7%	1.6-3.8						

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5.5

## Province specific surveillance data

Province: Kampong Speu		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)			
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
<i>Direct Sex workers</i>	96	29	30.2%	21.0-39.4	15.04%		50.43%		47.06%	30.20%
Age <20	12	4	33.3%							
Age 20-29	58	14	24.1%							
Age >=30	26	11	42.3%							
<i>* Beer Girls</i>	20	2	10.0%	3.1-23.1	9.04%				8.00%	10.00%
<i>** Freelance Sex Workers</i>										
<i>Police</i>										
Age <30	64	0	0.0%							
Age 30-49	227	6	2.6%							
Total (including 50-69)	300	6	2.0%	0.4-3.6	7.12%		1.09%		3.33%	2.00%
<i>ANC PC= 2 sites</i>	200	4	2.0%	0.1-3.9	8.25%					
<i>ANC RD= 2 sites</i>	65	0	0.0%		5.79%					
<i>ANC (PC+RD)</i>	265	4	1.5%	0.0-3.0			1.43	2.00%	0.50%	1.50%
Age 15-29	173	4	2.3%							
Age 30-49	92	0	0.0%							
<i>TB Patients Male</i>	67	1	1.5%	1.4-4.4						
<i>TB Patients Female</i>	68	2	2.9%	1.1-6.9						
<i>TB Patient Male + Female</i>	135	3	2.2%	0.3-4.7	NA		2.86%	3.89%		2.20%
<i>Blood donor</i>	241	5	2.1%	0.3-3.9						

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table5. 6

## Province specific surveillance data

Province: Kampong Thom		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
Direct Sex workers	78	23	29.5%	19.4-39.6	24.85%		20.59%		32.63%	29.50%	
	Age <20	7	30.4%								
	Age 20-29	12	28.6%								
	Age >=30	4	30.8%								
* Beer Girls	36	9	25.0%	10.8-39.1	34.80%				34.18%	25.00%	
** Freelance Sex Workers	15	6	40.0%	15.2-64.8	34%						
Police											
	Age <30	75	1	1.3%							
	Age 30-49	209	7	3.3%							
	Total(including 50-69)	294	8	2.7%	0.8-4.5	7.83%		2.86%	4.11%	2.70%	
ANC PC= 2 sites	150	2	1.3%	0.5-3.1	5.76%						
ANC RD= 3 sites	100	3	3.0%	0.3-6.3	2.91%						
ANC (PC+RD)	250	5	2.0%	0.2-3.7				3.23%	4.05%	2.00%	
	Age 15-29	176	5	2.8%							
	Age 30-49	74	0	0.0%							
TB Patients Male	47	5	10.6%	1.8-19.4							
TB Patients Female	53	4	7.5%	0.4-14.6							
TB Patient Male + Female	100	9	9.0%	3.4-14.6	0%		1.30%	2.63%		9.00%	
Blood donor	1092	18	1.6%	0.9-2.3							

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5.7a

## Province specific surveillance data

Province: Kampot		HIV Prevalence in 1999					HIV Prevalence (%)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
Direct Sex workers											
	Age <20	56	29	51.8%	38.7-64.9	25.33%			61.19%	51.80%	
	Age 20-29	11	5	45.5%			41.56%				
	Age ≥30	40	21	52.5%							
		5	3	60.0%							
* Beer Girls	47	5	10.6%	1.8-19.4	14.54%				24.19%	10.60%	
** Freelance Sex Workers					NA						
Police											
	Age <30	29	1	3.4%							
	Age 30-49	118	1	0.8%							
	Total(including 50-69)	155	2	1.3%	0.5-3.1	NA		8.57%	2.54%	5.44%	
										1.30%	
TB Patients Male	59	9	15.3%	6.1-24.5							
TB Patients Female	42	5	11.9%	2.1-21.7							
TB Patient Male + Female	101	14	13.9%	7.1-20.6	NA		6.00%	0.00%		13.90%	
Hospital Patients:											
	Medical Male										
	Female										
	Surgical Male										

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* Confidential interval only on total for each group no age specific

Table 5.7b

## Province specific surveillance data

## General population groups

Province: Kampt			HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999		
ANC PC= 1 sites	126	1	0.8%	0.8-2.4	NA							
ANC RD= 3 sites	129	3	2.3%	0.3-4.9	NA							
ANC (PC+RD)	255	4	1.6%	0.1-3.1			1.92%	2.18%	1.23%	1.60%		
Age 15-29	161	1	0.6%									
Age 30-49	94	3	3.2%									
Household women(PC)	303	9	3.0%	1.1-4.9	19.55%							
Household women(RD)	301	5	1.7%	0.2-3.2	14.03%							
Household women (PC+RD)	604	14	2.3%	1.1-3.5								
Age 15-29	273	4	1.5%									
Age 30-49	331	10	3.0%									
Household Male (PC)	302	8	2.6%	0.8-4.4	13.94%							
Household Male (RD)	309	2	0.6%	0.3-1.5	9.81%							
Household Male (PC+RD)	611	10	1.6%	0.6-2.6								
Age 15-29	345	2	0.6%									
Age 30-49	266	8	3.0%									
Blood donor	609	11	1.8%	0.7-2.8								

\* PC: Provincial Capital

\* RD: Remaining District

Table5.8

## Province specific surveillance data

Province: Kandal		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)			
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999
<b>Direct Sex workers</b>										
Age <20	104	33	31.7%	22.8-40.6	NA	13.64%	13.33%	19.13%	21.36%	31.70%
Age 20-29	35	11	31.4%							
Age 20-29	65	21	32.3%							
Age >=30	4	1	25.0%							
<b>* Beer Girls</b>	52	9	17.3%	7.0-27.6	NA					17.30%
<b>** Freelance Sex Workers</b>	48	7	14.6%	4.6-24.6	NA					
<b>Police</b>										
Age <30	31	2	6.5%							
Age 30-49	112	8	7.1%							
Total(including 50-69)	150	11	7.3%	3.1-11.5	15.60%		6.19%	7.41%	8.00%	7.30%
<b>ANC PC=</b>	300	9	3.0%	1.1-4.9	NA					
<b>1 sites</b>										
<b>ANC RD= sites</b>										
<b>ANC (PC+RD)</b>	300	9	3.0%	1.1-4.9			3.00%	2.88%	4.00%	3.00%
Age 15-29	211	8	3.8%							
Age 30-49	89	1	1.1%							
<b>TB Patients Male</b>	57	6	10.5%	2.5-18.5						
<b>TB Patients Female</b>	94	7	7.4%	2.1-12.7						
<b>TB Patient Male + Female</b>	151	13	8.6%	4.1-13.1	0%		2.78%	1.60%		8.60%

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5.9

## Province specific surveillance data

Province: Koh Kong						HIV Prevalence in 1999				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	HIV Prevalence (%) (sample size)				
						1995	1996	1997	1998	1999
<b>Direct Sex workers</b>	Age <20	41	20	48.8%	NA	39.16%	52.10%	52.00%	41.04%	41.70%
	Age 20-29	109	42	38.5%						
	Age ≥30	1	1	100.0%						
<b>* Beer Girls</b>						23.80%			17.57%	
<b>** Freelance Sex Workers</b>		23	11	47.8%	NA					48.80%
<b>Police</b>	Age <30	34	9	26.5%	NA					
	Age 30-49	112	26	23.2%						
	Total (including 50-69)	150	36	24.0%		10.67%	14.29%	21.00%	25.83%	24.00%
<b>ANC PC= 1 sites</b>		100	8	8.0%	NA					
<b>ANC RD= sites (PC+RD)</b>										
	Age 15-29	100	8	8.0%			5.26%	19.51%	5.95%	8.00%
	Age 30-49	67	6	9.0%						
		33	2	6.1%						
<b>TB Patients Male</b>		11	1	9.1%						
<b>TB Patients Female</b>		3	0	0.0%						
<b>TB Patient Male + Female</b>		14	1	7.1%	NA					

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table5.10a

## Province specific surveillance data

Province: Kratie						HIV Prevalence in 1999						HIV Prevalence (%) (sample size)					
Target Group		Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999						
Direct Sex workers		102	23	22.5%	14.4-30.6	0%		28.57%		25.00%	22.50%						
Age <20		21	3	14.3%													
Age 20-29		71	17	23.9%													
Age>=30		10	3	30.0%													
* Beer Girls		35	8	22.9%	9.0-36.8	0%				8.93%	22.90%						
** Freelance Sex Workers																	
Police																	
Age <30		77	0	0.0%													
Age30-49		225	5	2.2%													
Total(including 50-69)		303	5	1.7%	0.2-3.2	NA		3.70%		1.46%	1.70%						
TB Patients Male		33	2	6.1%	2.1-14.3												
TB Patients Female		23	5	21.7%	4.8-38.5												
TB Patient Male + Female		56	7	12.5%	3.8-21.2	NA		28.00%	8.33%		12.50%						
Hospital Patients:																	
Medical Male																	
Female																	
Surgical Male																	
Female																	

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* Confidential interval only on total for each group no age specific



Table5.10b

**Province specific surveillance data**  
**General population groups**

Province: Kratie		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
ANC PC= 1 sites	100	0	0.0%		0%						
ANC RD= 1 sites	100	0	0.0%		0%						
ANC (PC+RD)	200	0	0.0%								
Age 15-29	150	0	0.0%				0.29%	10.00%	0.86%	0.00%	
Age 30-49	50	0	0.0%								
Household women(PC)	302	3	1.0%	0.1-2.1	6.77%						
Household women(RD)	307	1	0.3%	0.3-0.9	3.75%						
Household women (PC+RD)	609	4	0.7%	0.0-1.4							
Age 15-29	329	1	0.3%								
Age 30-49	280	3	1.1%								
Household Male (PC)	297	2	0.7%	0.2-1.6	10.97%						
Household Male (RD)	309	4	1.3%	0.0-2.6	3.44%						
Household Male (PC+RD)	606	6	1.0%	0.1-0.3							
Age 15-29	338	2	0.6%								
Age 30-49	268	4	1.5%								
Blood donor	291	2	0.7%	0.3-1.7							

\* PC: Provincial Capital

\* RD: Remaining District

Table 5.11

## Province specific surveillance data

Province: Pailin		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1994	1995	1996	1997	1998	1999
<i>Direct Sex workers</i>											
Age <20	110	12	10.9%	5.1-16.7	6.83%						10.9%
Age 20-29	35	3	8.6%								
Age >=30	67	7	10.4%								
	8	2	25.0%								
<i>* Beer Girls</i>	8	1	12.5%	10.4-35.4	0.00%						12.5%
<i>** Freelance Sex Workers</i>	61	2	3.3%	1.2-7.8	0%						
<i>Police</i>											
Age <30	50	3	6.0%								
Age 30-49	105	6	5.7%								
Total(including 50-69)	162	9	5.6%	2.1-9.1							5.6%
<i>ANC PC= 1 sites</i>	156	3	1.9%	0.2-4.0	5						
<i>ANC RD= 1 sites</i>	25	3	12.0%	0.7-24.7	0%						
<i>ANC (PC+RD)</i>	181	6	3.3%	0.7-5.9							3.3%
Age 15-29	114	3	2.6%								
Age 30-49	67	3	4.5%								
<i>TB Patients Male</i>											
<i>TB Patients Female</i>											
<i>TB Patient Male + Female</i>											

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5.12

## Province specific surveillance data

Province: Phnom Penh					HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999				
Direct Sex workers	154	73	47.4%	31.5-55.3	22.61%	30.47%	41.62%	44.44%	61.33%	47.40%				
	Age <20 81	36	44.4%											
	Age 20-29 71	37	52.1%											
	Age>=30 2	0	0.0%											
* Beer Girls	110	7	6.4%	1.8-11.0	22.53%	20.18%			7.00%	6.40%				
** Freelance Sex Workers	100	7	7.0%	2.0-12.0	17.29%									
Police														
	Age <30 66	6	9.1%											
	Age 30-49 86	6	7.0%											
	Total(including 50-69) 153	13	8.5%	4.1-12.9	38.97%	6.58%	5.23%		8.67%	8.50%				
ANC PC= 3 sites	511	25	4.9%	3.0-6.8	14.12%									
ANC RD= sites														
ANC (PC+RD)														
	Age 15-29 348	25	4.9%	3.0-6.8		3.03%	3.23%	0.81%	3.75%	4.50%				
	Age 30-49 163	18	5.2%											
		7	4.3%											
TB Patients Male	101	16	15.8%	8.0-22.0										
TB Patients Female	49	5	10.2%	1.7-18.7										
TB Patient Male + Female	150	21	14.0%	8.4-19.5	x	11.25%	11.46%	15.38%		14.00%				
Hospital Patients:	400	42	10.5%	7.5-13.5	NA			7.68%	11.25%	10.50%				
Medical Male	85	6	7.1%	1.6-12.6										
Female	65	10	15.4%	6.6-24.2										
Surgical Male	141	13	9.2%	4.4-14.0										
Female	109	13	11.9%	5.8-18.0										
Blood donor	5792	230	4.0%	3.5-4.5										

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* Confidential interval only on total for each group no age specific

Table 5. 13

## Province specific surveillance data

Province: Prey Veng			HIV Prevalence in 1999				HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
Direct Sex workers	150	11	7.3%	3.1-11.5	NA		29.67%		29.33%	7.30%	
	Age <20	73	4	5.5%							
	Age 20-29	77	7	9.1%							
	Age>=30	0	0	0.0%							
* Beer Girls	100	31	31.0%	21.9-40.1	NA				34.00%	31.00%	
** Freelance Sex Workers											
Police	Age <30	48	1	2.1%							
	Age30-49	99	5	5.1%							
	Total(including 50-69)	150	6	4.0%	0.9-7.1	NA	3.76%		6.00%	4.00%	
	ANC PC= 2 sites	90	1	1.1%	1.0-3.2	NA					
ANC RD= 2 sites	100	3	3.0%	0.3-6.3	NA						
ANC (PC+RD)	190	4	2.1%	0.1-4.1			1.33%	4.78%	2.07%	2.10%	
	Age 15-29	129	2	1.6%							
	Age 30-49	61	2	3.3%							
	TB Patients Male	57	3	5.3%	0.5-11.1						
TB Patients Female	43	0	0.0%								
TB Patient Male + Female	100	3	3.0%	0.3-6.3	NA		0.00%	5.05%		8.00%	
Blood donor	120	5	4.2%	0.6-7.8							

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5.15

## Province specific surveillance data

Province: Rattanakiri						HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999					
Direct Sex workers															
	Age <20	32	15	46.9%	29.6-64.2	NA	21.43%	35.00%	34.21%	21.21%	46.90%				
	Age 20-29	4	2	50.0%											
	Age 20-29	27	12	44.4%											
Age>=30	1	1	100.0%												
* Beer Girls	32	5	15.6%	3.0-28.2	NA				23.33%	15.60%					
** Freelance Sex Workers															
Police															
	Age <30	35	0	0.0%											
	Age30-49	59	1	1.7%											
	Total(including 50-69)	98	1	1.0%	0.1-3.0	54.27%	3.90%	14.86%	0.90%	1.00%					
ANC PC= 1 sites	99	1	1.0%	0.1-3.0	NA										
ANC RD= 3 sites	84	1	1.2%	1.1-3.5	NA										
ANC (PC+RD)															
	Age 15-29	183	2	1.1%	0.4-2.6		6.19%	2.49%	2.07%	1.10%					
	Age 15-29	129	1	0.8%											
	Age 30-49	54	1	1.9%											
TB Patients Male															
TB Patients Female															
TB Patient Male + Female								0.00%							

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5. 16

## Province specific surveillance data

Province: Siem Reap		HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
Direct Sex workers	150	27	18.0%	11.8-24.1	NA	35.09%	49.00%		38.00%	18.00%	
	Age <20	46	4	8.7%							
	Age 20-29	89	20	22.5%							
	Age>=30	15	3	20.0%							
* Beer Girls	30	7	23.3%	8.2-38.4	NA	19.57%			33.00%	23.30%	
** Freelance Sex Workers	70	9	12.9%	5.0-20.7	NA						
Police											
	Age <30	71	8	11.3%							
	Age30-49	73	5	6.8%							
	Total(including 50-69)	150	14	9.3%	4.6-13.9	NA	9.76%	10.00%	6.00%	9.30%	
ANC PC= 1 sites	200	14	7.0%	3.5-10.5	NA						
ANC RD= 3 sites	100	0	0.0%		NA						
ANC (PC+RD)		300	14	4.7%	2.3-7.1	4.02%	1.10%	4.41%	1.75%	4.70%	
	Age 15-29	207	11	5.3%							
	Age 30-49	93	3	3.2%							
TB Patients Male	58	5	8.6%	1.4-15.8							
TB Patients Female	42	4	9.5%	0.6-18.4							
TB Patient Male + Female	100	9	9.0%	3.4-14.6	NA	0.50%	1.54%	5.00%		9.00%	
Blood donor	693	15	2.2%	1.1-3.3							

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table5. 17

## Province specific surveillance data

Province: Sihanouk Ville						HIV Prevalence in 1999			HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999			
Direct Sex workers	150	63	42.0%	34.1-49.9	46.99%	37.74%	51.52%		57.33%	42.00%			
	Age <20	31	10	32.3%									
	Age 20-29	115	51	44.3%									
	Age>=30	4	2	50.0%									
* Beer Girls	82	15	18.3%	9.9-26.7	5.74%	22.73%			24.00%	18.30%			
** Freelance Sex Workers													
Police	Age <30	17	3	17.6%									
	Age30-49	126	20	15.9%									
	Total(including 50-69)	150	23	15.3%	9.5-21.1	48.27%	21.20%	13.73%		11.76%	15.30%		
	ANC PC= 1 sites	100	6	6.0%	1.3-10.6	NA							
ANC RD= 2 sites ANC (PC+RD)	100	0	0.0%		NA								
	200	6	3.0%	0.6-5.4		4.44%	2.11%	2.88%	3.75%	3.00%			
	Age 15-29	121	4	3.3%									
	Age 30-49	79	2	2.5%									
TB Patients Male	28	8	28.6%	11.9-45.3									
TB Patients Female	20	1	5.0%	4.5-14.5									
TB Patient Male + Female	48	9	18.8%	7.7-29.8	NA	3.57%				18.80%			

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific



Table5.18

## Province specific surveillance data

Province: Stung Treng						HIV Prevalence in 1999		HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999		
Direct Sex workers												
	Age <20	55	16	29.1%	17.1-41.1	9.21%		22.60%	33.30%	29.10%		
	Age 20-29	14	5	35.7%								
	Age 20-29	33	10	30.3%								
Age>=30	8	1	12.5%									
* Beer Girls	14	0	0.0%		NA				10.00%	0.00%		
** Freelance Sex Workers												
Police												
Age <30	25	0	0.0%									
Age30-49	119	0	0.0%									
Total(including 50-69)	152	0	0.0%		37.50%		2.60%	0.00%	0.78%	0.00%		
ANC PC= 1 sites	100	2	2.0%	0.7-4.7	NA							
ANC RD= 5 sites	63	0	0.0%		NA							
ANC (PC+RD)	163	2	1.2%	0.4-2.9			0.76%	3.49%	0.25%	1.20%		
Age 15-29	105	1	1.0%									
Age 30-49	58	1	1.7%									
TB Patients Male	21	0	0.0%									
TB Patients Female	14	1	7.1%	6.3-20.5								
TB Patient Male + Female	35	1	2.9%	2.7-8.5	NA			8.33%		2.90%		

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific



Table 5. 19

## Province specific surveillance data

Province: Svay Rieng						HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999					
Direct Sex workers															
Age <20	92	24	26.1%	17.1-35.1	4.16%		36.23%	23.86%	25.00%	26.10%					
Age 20-29	17	5	29.4%												
Age 20-29	66	17	25.8%												
Age>=30	9	2	22.2%												
* Beer Girls	7	1	14.3%	11.6-40.4	58.82%				17.54%	14.30%					
** Freelance Sex Workers	54	7	13.0%	4.0-22.0	NA										
Police															
Age <30	60	4	6.7%												
Age30-49	199	4	2.0%												
Total(Including 50-69)	266	8	3.0%	0.9-5.0	32%		0.00%	5.00%	0.67%	3.00%					
ANC PC= 1 sites	146	6	4.1%	0.9-7.3											
ANC RD= 8 sites	203	3	1.5%	0.2-3.2	0%										
ANC (PC+RD)	349	9	2.6%	0.9-4.3	0%		92.00%	0.90%	2.50%	2.60%					
Age 15-29	202	6	3.0%												
Age 30-49	147	3	2.0%												
TB Patients Male	83	5	6.0%	0.9-11.1											
TB Patients Female	117	2	1.7%	0.6-4.0											
TB Patient Male + Female	200	7	3.5%	0.9-6.0	0%		0.00%	2.63%		3.50%					
Blood donor	346	0	0.0%												

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* PC: Provincial Capital

\* RD: Remaining District

\* Confidential interval only on total for each group no age specific

Table 5. 20a

## Province specific surveillance data

Province: Takeo			HIV Prevalence in 1999				HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
Direct Sex workers	Age <20	83	27	32.5%	22.4-42.6	NA		24.64%	24.14%	41.41%	32.50%
	Age 20-29	16	4	25.0%							
	Age ≥30	58	20	34.5%							
	9	3	33.3%								
* Beer Girls	53	14	26.4%	14.5-38.3	NA				6.67%	26.40%	
** Freelance Sex Workers											
Police											
	Age <30	40	2	5.0%							
	Age 30-49	244	2	0.8%							
	Total(including 50-69)	300	4	1.3%	0.0-2.6	NA	2.34%		3.28%	1.30%	
TB Patients Male	138	3	2.2%	0.2-4.6							
TB Patients Female	163	10	6.1%	2.4-9.8							
TB Patient Male + Female	301	13	4.3%	2.0-6.6	NA		2.99%	2.50%		4.30%	
Hospital Patients:											
Medical Male											
Female											
Surgical Male											
Female											

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke Bar and Massage girls

\* Confidential interval only on total for each group no age specific

Table5. 20b

**Province specific surveillance data**  
**General population groups**

Province: Takeo						HIV Prevalence in 1999					HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999					
ANC PC= 1 sites	150	1	0.7%	0.6-2.0	NA										
ANC RD= 3 sites	150	1	0.7%	0.6-2.0	NA										
ANC (PC+RD)	300	2	0.7%	0.2-1.6			0.92%	3.47%	3.25%	0.07%					
Age 15-29	203	2	1.0%												
Age 30-49	97	0	0.0%												
Household women(PC)	303	2	0.7%	0.2-1.6	26.98%										
Household women(RD)	300	3	1.0%	0.1-2.1	7.97%										
Household women (PC+RD)	603	5	0.8%	0.1-1.5											
Age 15-29	260	2	0.8%												
Age 30-49	343	3	0.9%												
Household ,Male (PC)	295	2	0.7%	0.2-1.6	16.43%										
Household Male (RD)	327	4	1.2%	0.0-2.4	13.94%										
Household Male (PC+RD)	622	6	1.0%	0.2-1.8											
Age 15-29	303	2	0.7%												
Age 30-49	319	4	1.3%												
Blood donor	955	12	1.3%	0.6-2.0											

\* PC: Provincial Capital

\* RD: Remaining District

Table 6a **Prevalence and Confidence intervals for each sentinel group 1995-1999 across all provinces surveyed**

All Provinces			HIV Prevalence in 1999				HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999	
Direct Sex workers	2259	751	33.2%	31.3 - 35.1		37.93%	38.29%	39.31%	42.60%	33.20%	
	Age <20 623	162	26.0%								
	Age 20-29 1469	531	36.1%								
Age>=30 167	58	34.7%									
* Beer Girls	931	184	19.8%	17.2 - 22.4		24.71%			19.15%	19.80%	
** Freelance Sex Workers	557	93	16.7%	13.6 - 19.8							
Police											
Age <30 977	48	4.9%									
Age30-49 3022	140	4.6%									
Total(including 50-69) 4141	194	4.7%	4.1 - 5.3			8.07%	5.46%	5.96%	6.23%	4.70%	
TB Patients Male 1109	105	9.5%	7.8 - 11.2								
TB Patients Female 1057	67	6.3%	4.8 - 7.8								
TB Patient Male + Female 2166	172	7.9%	6.8 - 9.0			2.49%	3.89%	5.22%		7.90%	
Hospital Patients:	1061	117	11.0%	9.1 - 12.9				5.97%	12.19%	11.00%	
Medical Male 231	31	13.4%	9.0 - 17.8								
Female 215	37	17.2%	12.2 - 22.2								
Surgical Male 382	31	8.1%	5.4 - 10.8								
Female 233	18	7.7%	4.3 - 11.1								

\* In previous years beer girls were combined with bar girls

\*\* Freelance includes Karaoke, Bar and Massage girls

\* Confidential interval only on total for each group no age specific

**Table 6b Prevalence and Confidence intervals for each sentinel group 1995-1999 across all provinces surveyed**

All provinces						HIV Prevalence in 1999						HIV Prevalence (%) (sample size)				
Target Group	Sample Size	Number Positive	HIV Prevalence	95% Confidence Interval	Percent Refusal	1995	1996	1997	1998	1999						
<b>ANC PC= 24 sites</b>	3388	102	3.0%	2.4 - 3.6												
<b>ANC RD= 54 sites</b>	2009	41	2.0%	1.4 - 2.6												
<b>ANC (PC+RD)</b>	5397	143	2.6%	2.2 - 3.0		2.64%	1.73%	3.20%	2.40%	2.60%						
Age 15-29	3588	103	2.9%													
Age 30-49	1809	40	2.2%													
<b>Household women(PC)</b>	1538	24	1.6%	1.0 - 2.2												
<b>Household women(RD)</b>	1528	14	0.9%	0.4 - 1.4												
<b>Household women (PC+RD)</b>	3066	38	1.2%	0.8 - 1.6												
Age 15-29	1471	14	1.0%													
Age 30-49	1595	24	1.5%													
<b>Household Male (PC)</b>	1513	30	2.0%	1.3 - 2.7												
<b>Household Male (RD)</b>	1556	24	1.5%	0.9 - 2.1												
<b>Household Male (PC+RD)</b>	3069	54	1.8%	1.3 - 2.3												
Age 15-29	1706	22	1.3%													
Age 30-49	1363	32	2.3%													
<b>Blood donor</b>	20360	637	3.1%	2.8 - 3.3		4.47%	3.72%	3.56%	4.16%	3.10%						

\* PC: Provincial Capital

\* RD: Remaining District

**Table 7.**

**Gender specific HIV prevalence ratio among selected sentinel groups HSS 1999**

<b>Sentinel group</b>	<b>Male</b>	<b>Female</b>	<b>Sex ratio</b>
Tuberculosis patient	9.5%	6.3%	1.51
Hospital in patient Medical Ward	13.4%	17.2%	0.78
Hospital in patient Surgical Ward	8.1%	7.7%	1.05
Household	1.8%	1.2%	1.5
Blood donor (Phnom Penh only)	0.9%	0.6%	1.5

Figure 1

HIV Sentinel Surveillance Sites 20/24

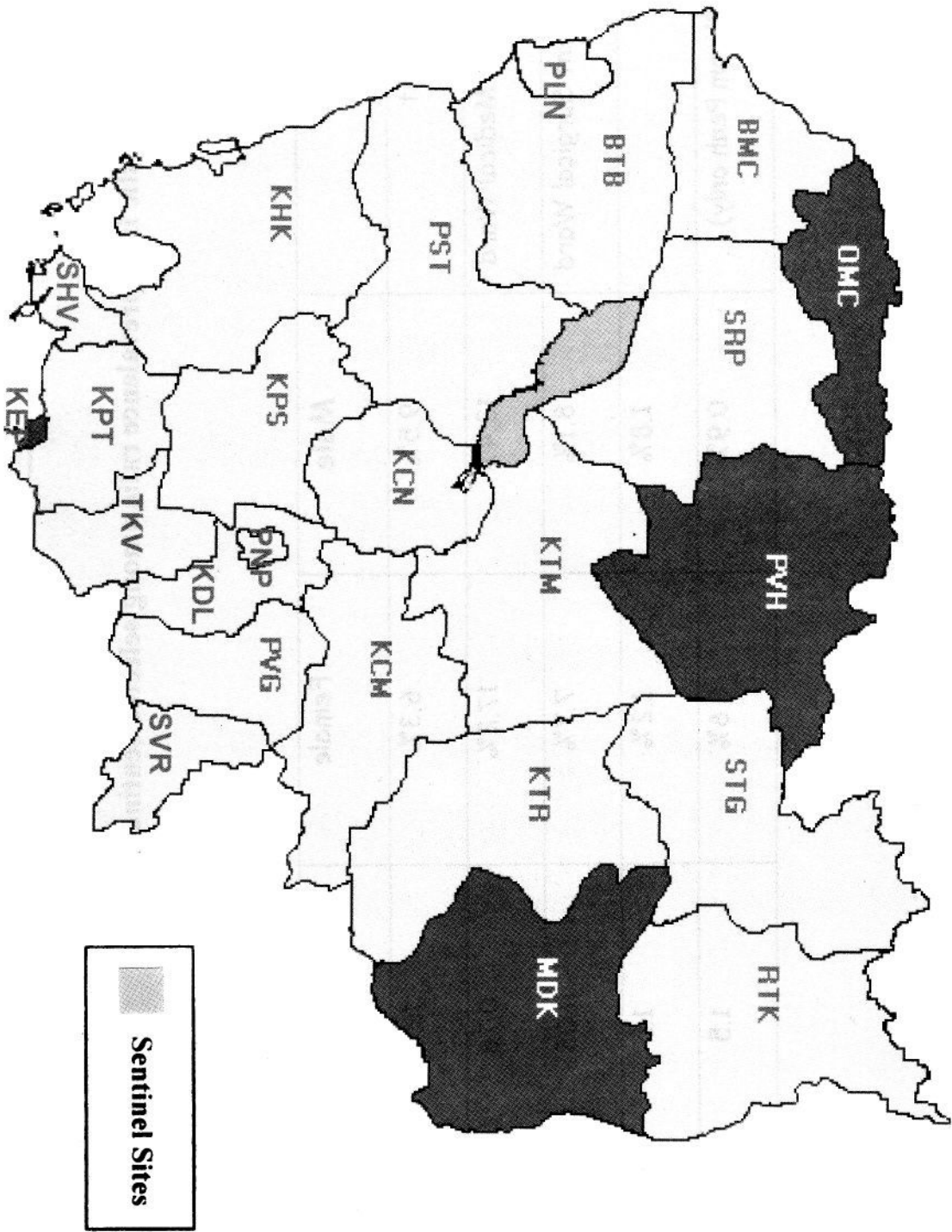


Figure.2

HIV Seroprevalence among Target Populations in Cambodia, 1999

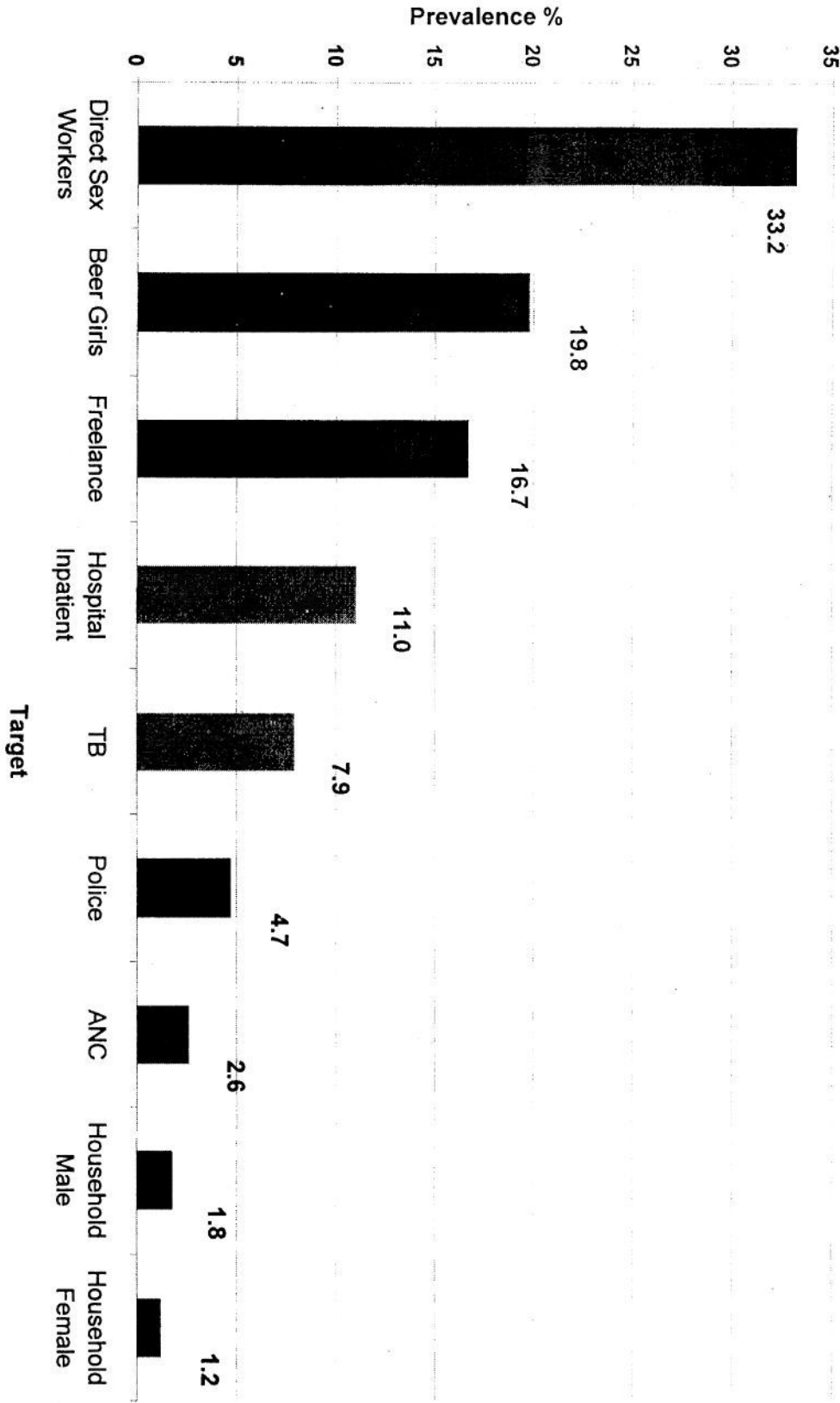




Figure 3a

The Trend of HIV Seroprevalence among DCSWs

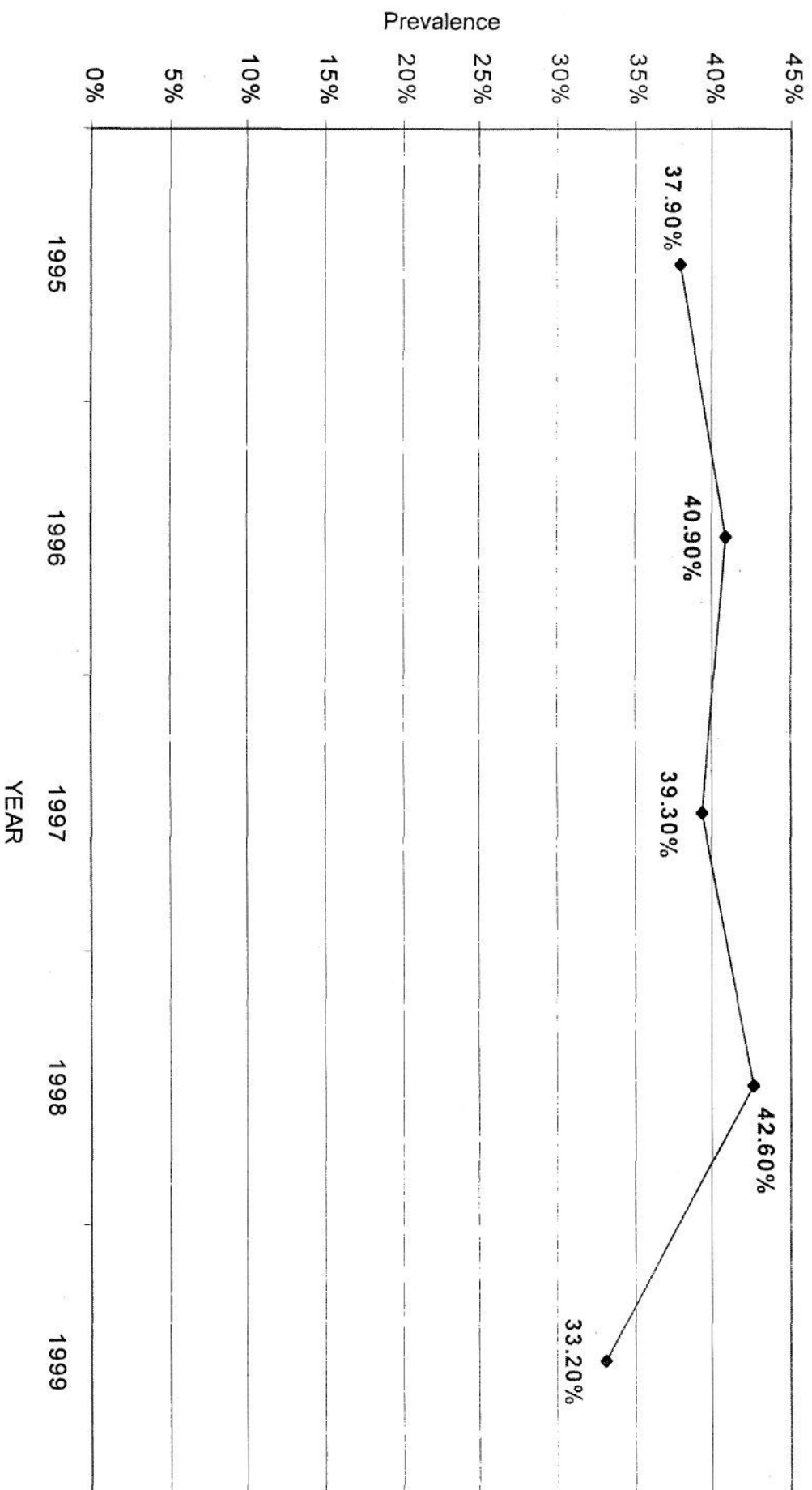


Figure 3b

The trend of HIV Seroprevalence among DCSWs by age

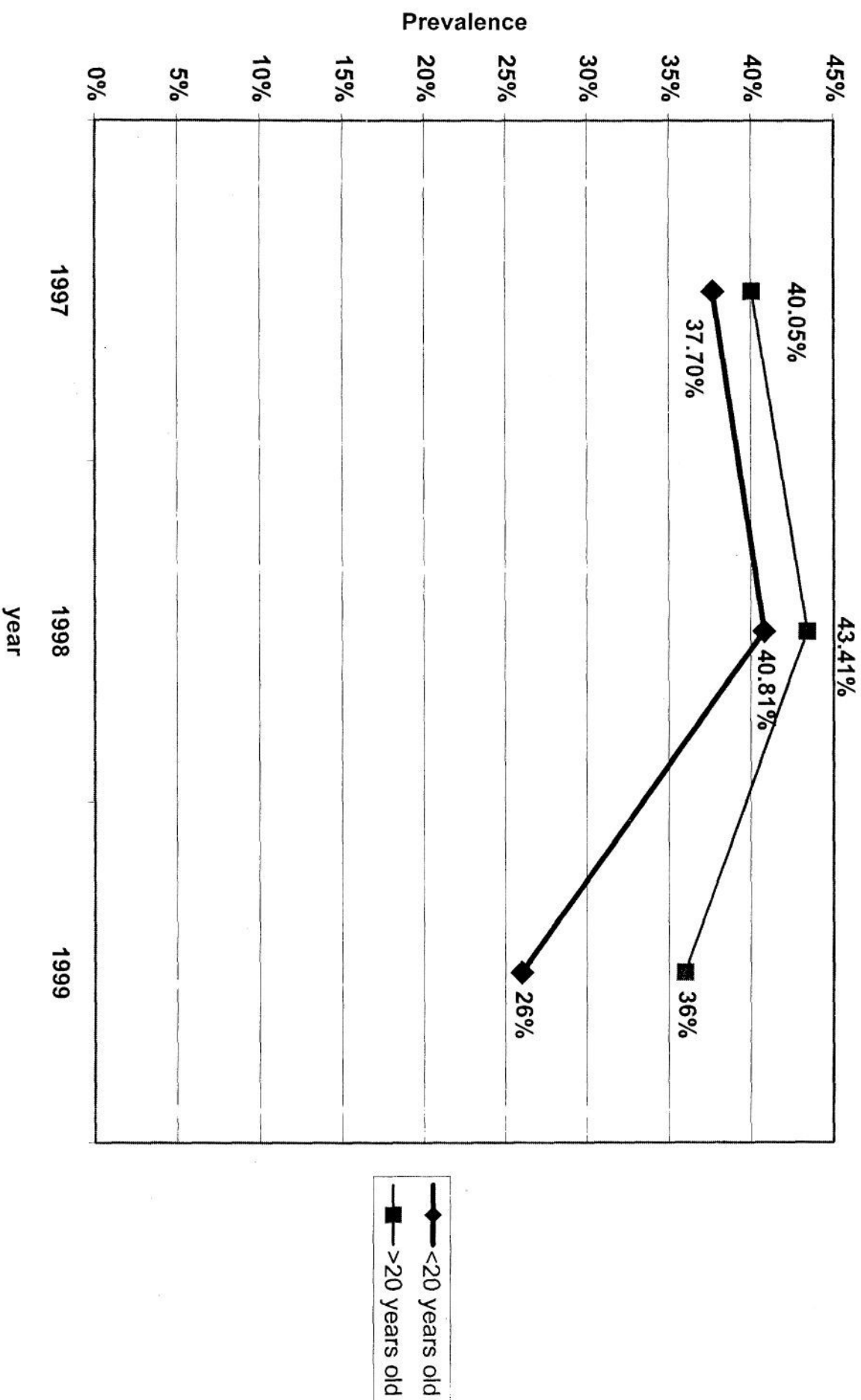


Figure. 4a

### The trend of HIV Seroprevalence among Policemen

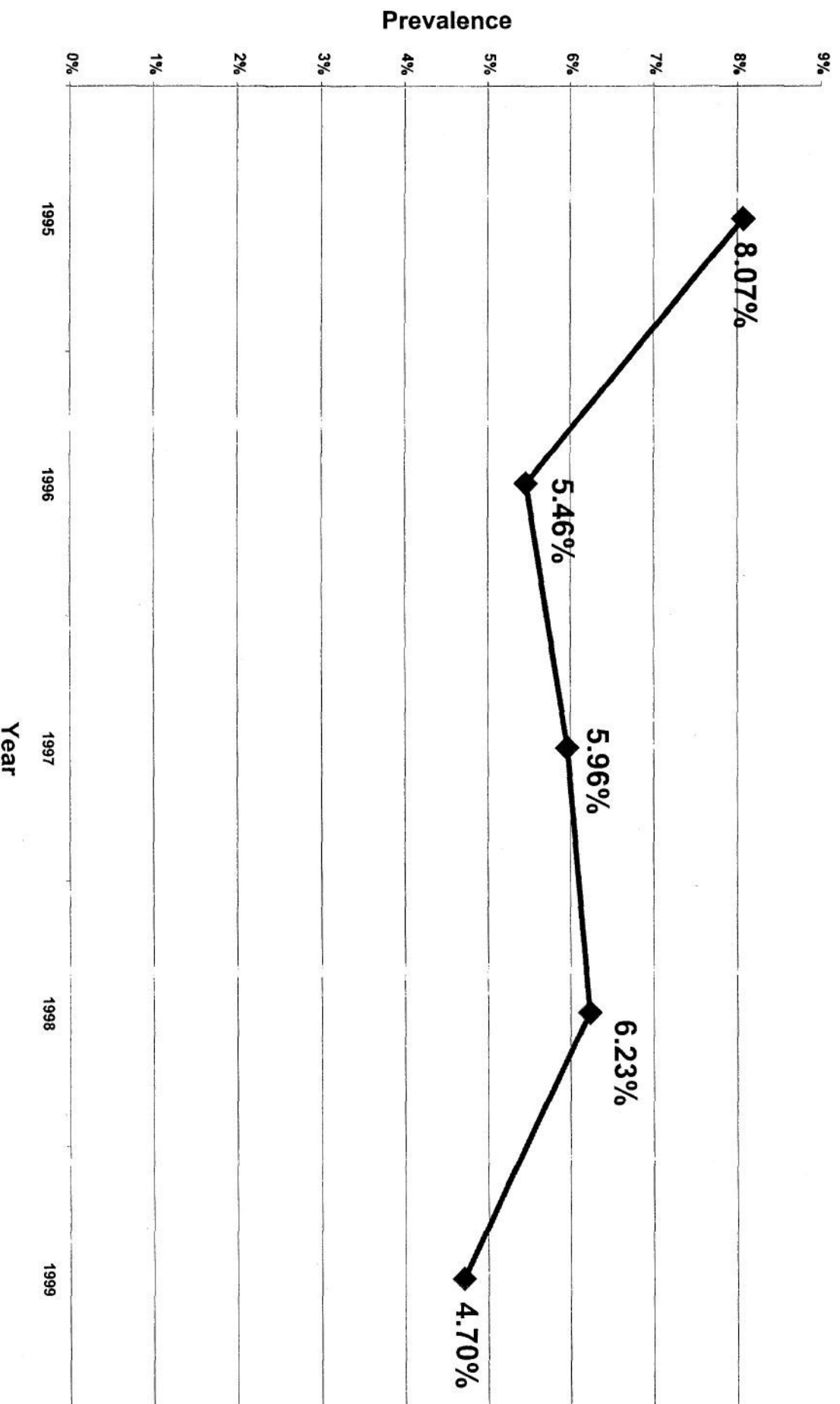


Figure.4b

The Trend of HIV Seroprevalence among police by age

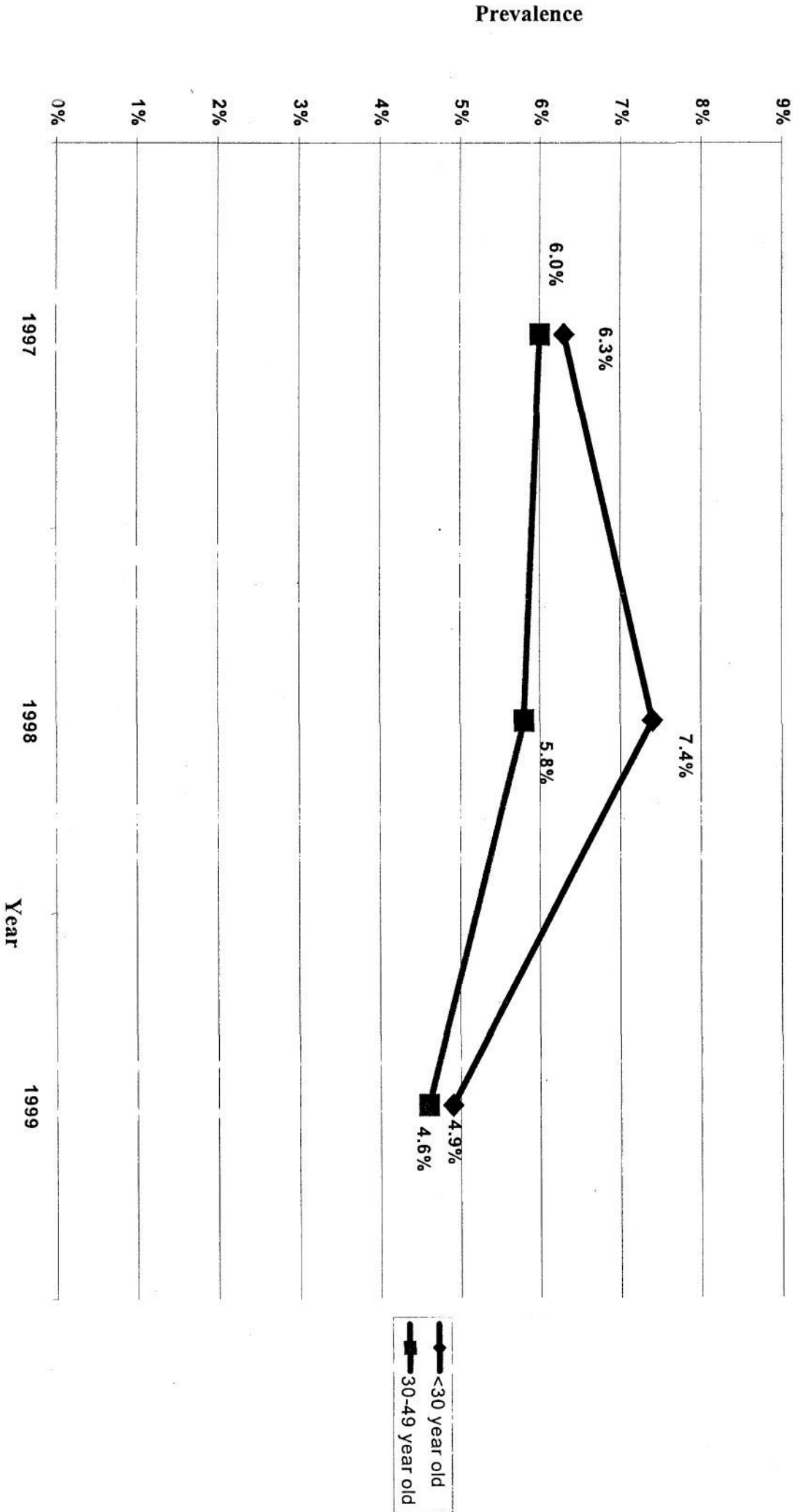


Figure.5

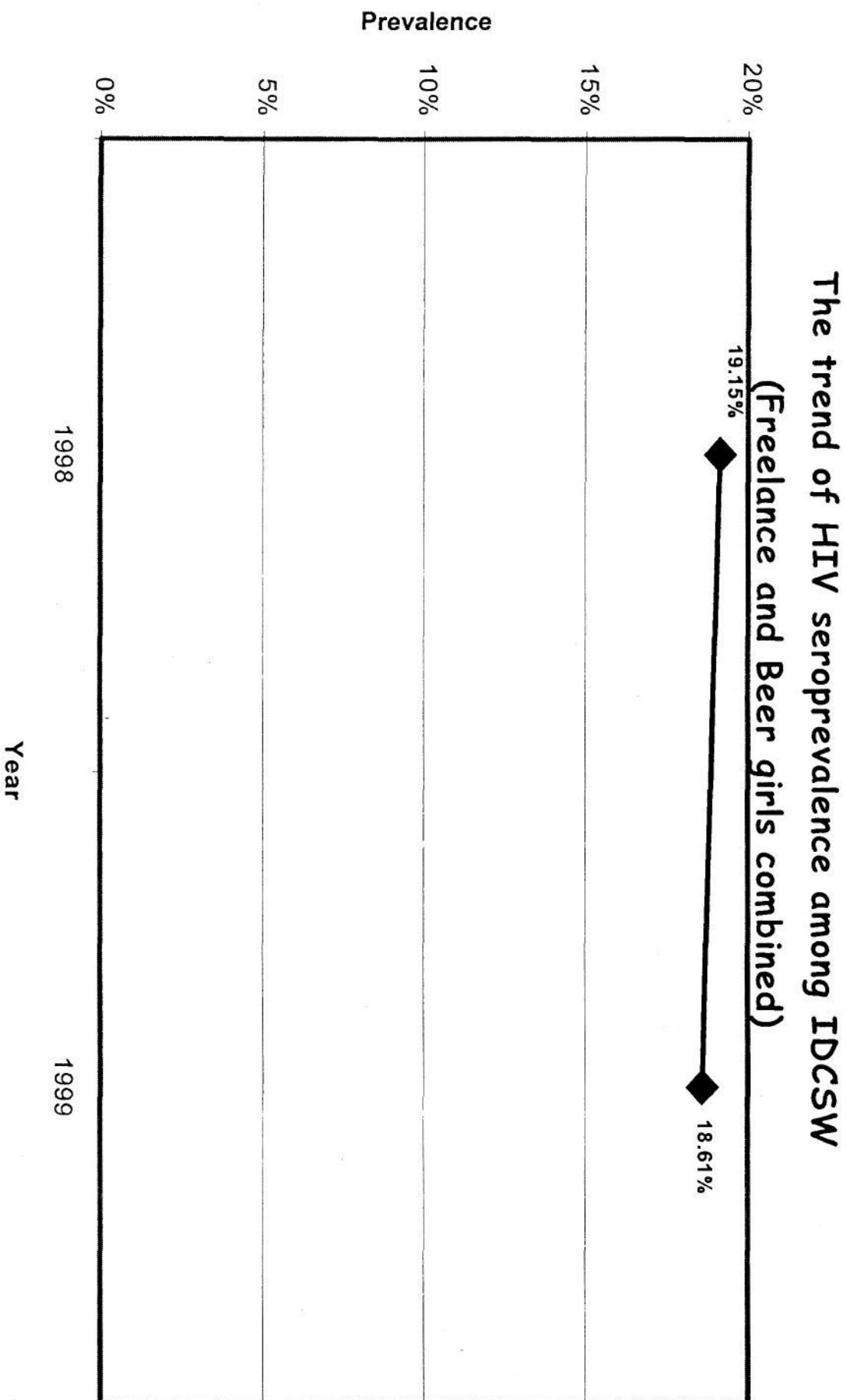


Figure 6

HIV Seroprevalence among Voluntary blood donors, Cambodia

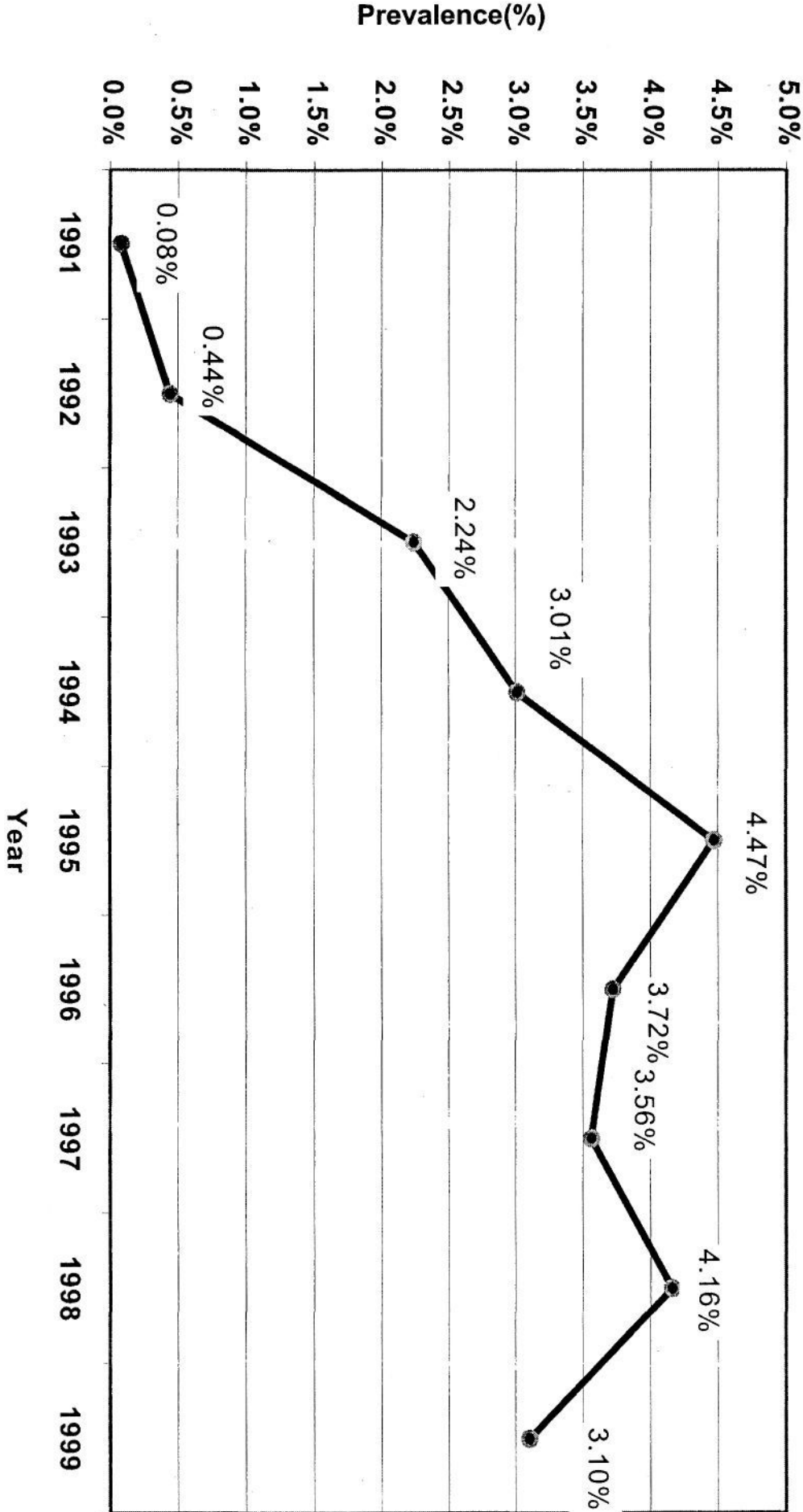


Figure 7

# The trend of HIV seroprevalence among TB Patients

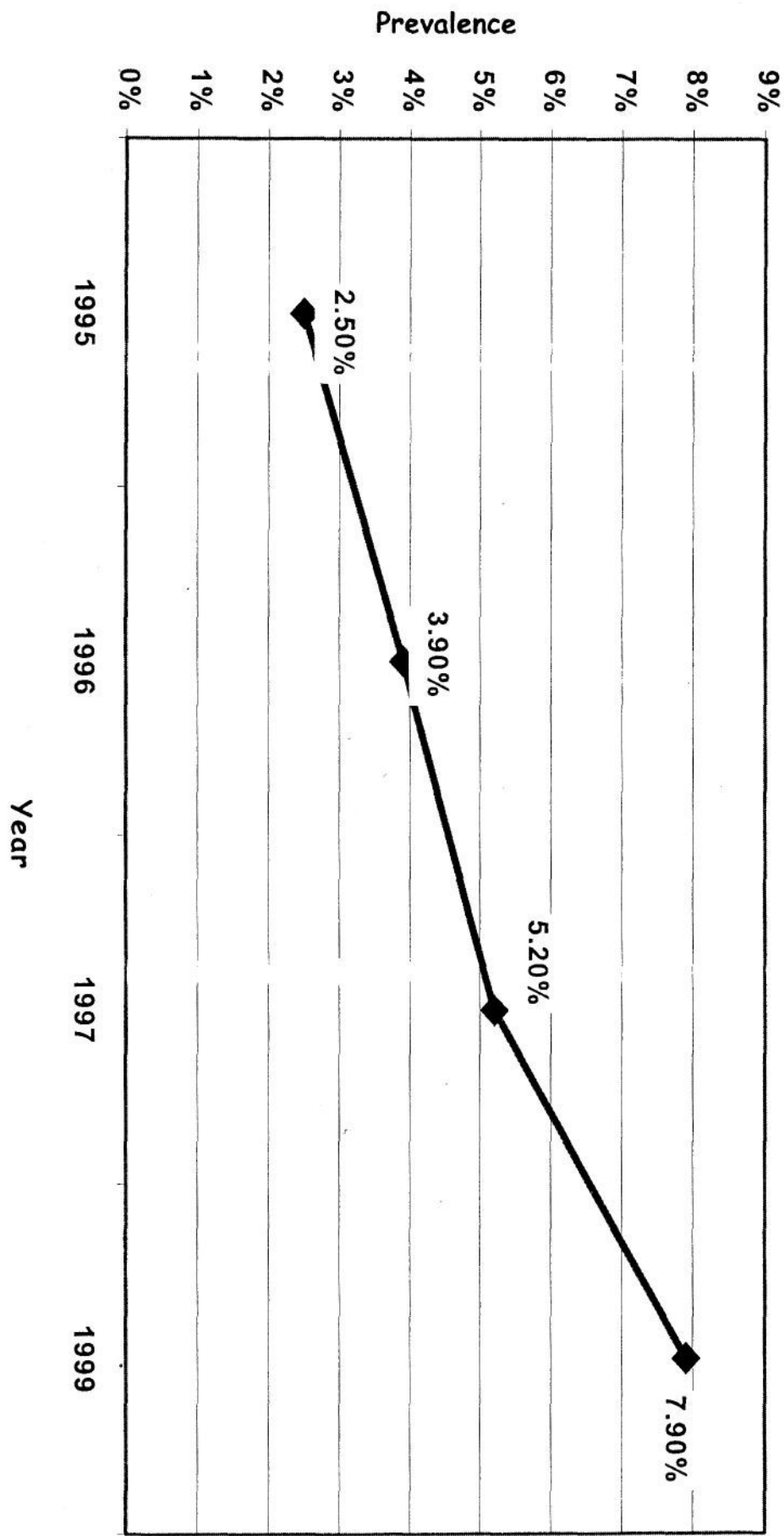


Figure8

AIDS cases and deaths reported to National Center for HIV/AIDS,  
Dermatology and STDs, Ministry of Health

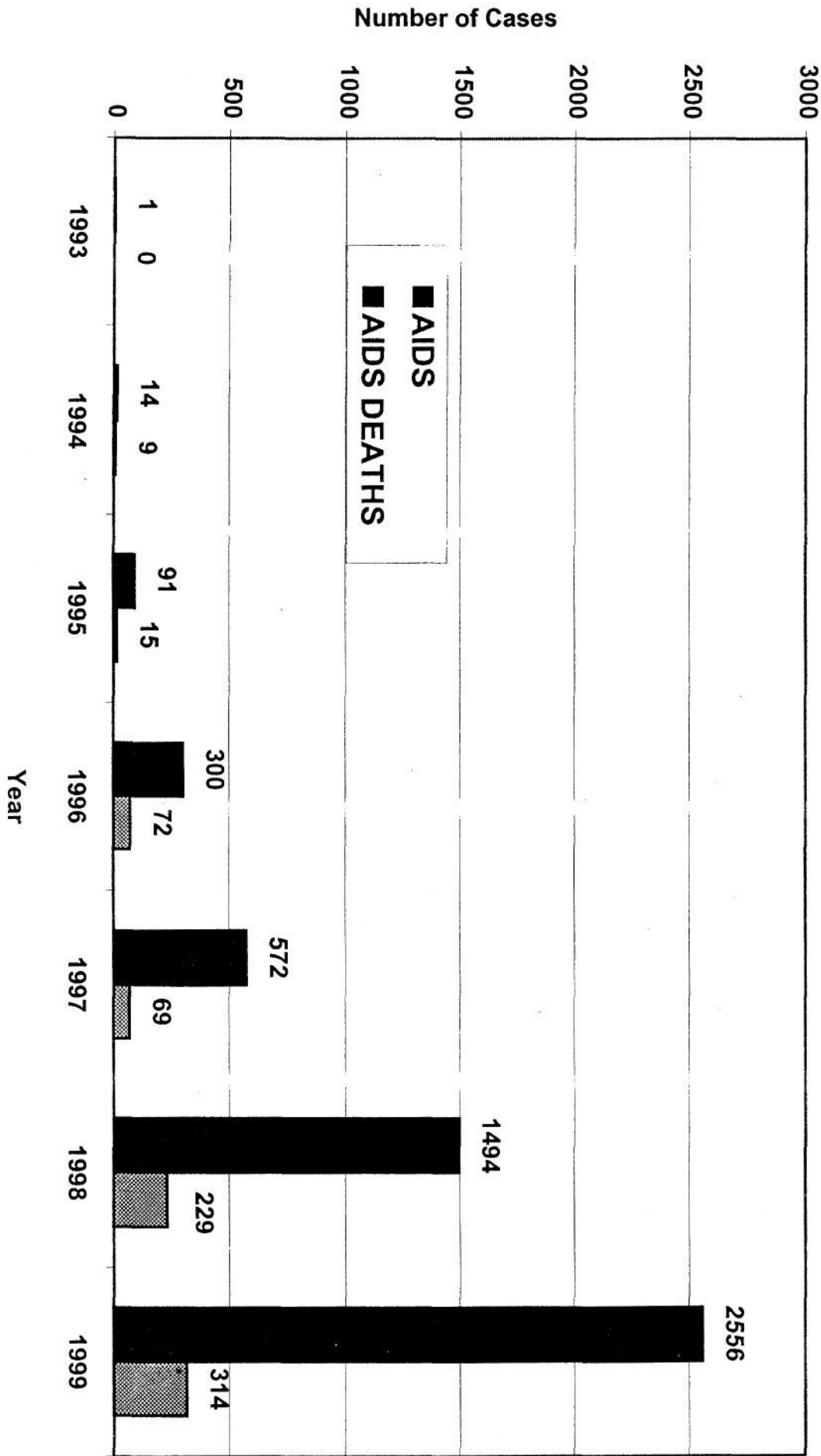




Figure9

**Estimated National Prevalence of HIV among Males and Females  
aged 15-49 in Cambodia**

