

Report on Sentinel Surveillance in Cambodia 1998

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CAMBODIA SENTINEL SURVEILLANCE STUDY TEAM

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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 1998, National Center for HIV/AIDS, Dermatology and STDs (former National AIDS Program) has finished its fifth round of HIV sentinel surveillance.

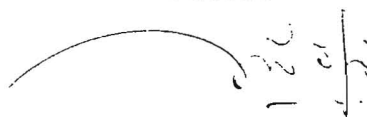
On the basis of available data, The National Center for HIV/AIDS, Dermatology and STDs, Ministry of Health estimated that by the end of 1998 Cambodia has approximately 180,000 people living with HIV.

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 1998.

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. *g*

National Center for HIV/AIDS, STDs
and Dermatology
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Dr Mean Chhi Vun

Table of Contents

TABLE OF CONTENTS	1
LIST OF FIGURES AND TABLES.....	2
ACKNOWLEDGEMENTS	3
EXECUTIVE SUMMARY	4
BACKGROUND	5
OBJECTIVES OF SURVEILLANCE IN 1998	6
METHODOLOGY OF THE 1998 SURVEILLANCE.....	7
A. SCOPE AND COVERAGE	7
B. ORGANIZATION OF THE SURVEY.....	7
C. SURVEY DESIGN	8
D. SAMPLE SIZE	8
E. DATA AND SAMPLE COLLECTION AND PROCESSING	8
RESULTS	10
LIMITATIONS OF THE STUDY	12
CONCLUSIONS	13
RECOMMENDATIONS.....	14
FIGURES (1-10)	
TABLES (1-7)	
APPENDIX (TABLES A1-A19)	

List of Figures and Tables

- FIGURE 1:** HIV SENTINEL SURVEILLANCE SITES IN CAMBODIA, 1998
- FIGURE 2:** HIV SEROPREVALENCE AMONG SENTINEL GROUPS IN CAMBODIA, 1998
- FIGURE 3:** HIV SEROPREVALENCE AMONG DIRECT COMMERCIAL SEX WORKERS IN CAMBODIA, 1998
- FIGURE 4:** HIV SEROPREVALENCE AMONG INDIRECT COMMERCIAL SEX WORKERS IN CAMBODIA, 1998
- FIGURE 5:** HIV SEROPREVALENCE AMONG POLICE IN CAMBODIA, 1998
- FIGURE 6:** HIV SEROPREVALENCE AMONG MARRIED WOMEN IN CAMBODIA, 1998
- FIGURE 7:** HIV SEROPREVALENCE AMONG MARRIED WOMEN IN CAMBODIA, 1998, URBAN VERSUS RURAL AREAS
- FIGURE 8:** HIV SEROPREVALENCE AMONG HOSPITAL IN-PATIENTS IN CAMBODIA, 1998
- FIGURE 9:** ESTIMATES AND PROJECTIONS OF HIV INFECTIONS AND AIDS CASES IN CAMBODIA, 1999-2003
- FIGURE 10:** WOMEN 15-49 YEARS WITH HIV INFECTION AND AT RISK OF HIV INFECTION
- TABLE 1:** SUMMARY OF SENTINEL SITES AND GROUPS FOR THE NATIONAL HIV SENTINEL SURVEILLANCE PROGRAM IN CAMBODIA, 1994-1997
- TABLE 2:** SUMMARY OF HIV PREVALENCE RATES IN SENTINEL GROUPS, 1992-1997
- TABLE 3:** HIV SEROPREVALENCE BY AGE, SEX, AND LOCATION AMONG SENTINEL GROUPS IN CAMBODIA, 1998
- TABLE 4:** HIV SEROPREVALENCE AMONG SENTINEL GROUPS IN THE 1998 SENTINEL SURVEILLANCE, CAMBODIA
- TABLE 5:** ESTIMATION OF HIV PREVALENCE IN CAMBODIA, 1998
- TABLE 6:** PARAMETERS USED IN EPIMODEL
- TABLE 7:** ESTIMATED NUMBER OF ADULTS AND CHILDREN LIVING WITH HIV/AIDS, END OF 1998

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- Family Health International (FHI) for their financial support.
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- The provincial and municipal governors for their encouragement at all stages and for their substantial contribution to the survey.
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- The nurses at the health care centers who willingly provided relevant information and a helping hand in this study.
- The local community leaders for their cooperation and help.
- The sentinel groups (direct and indirect commercial sex workers, police, married women of reproductive age, and hospital in-patients) who participated and made the study possible and successful.

Executive summary

The fifth round of sentinel surveillance was conducted in Cambodia between April and June 1998 in 19 of the 21 provinces and villes. Five sentinel groups - direct commercial sex workers (brothel workers), indirect commercial sex workers (entertainment establishment girls and beer promotion girls), police, married women of reproductive age, and hospital in-patients. Direct commercial sex workers, indirect commercial sex workers, police, and married women of reproductive age were included in all provinces, but hospital in-patients were included in only two provinces (Battambang and Kampon Cham), and the capital city (Phnom Penh). Samples were taken from rural areas in only three provinces (Battambang, Takeo, and Kratie), and only from married women of reproductive age.

The prevalence of HIV was highest in direct commercial sex workers, at 42.6%, followed by indirect commercial sex workers, at 19.1%. The prevalence among police was 6.2% and among married women of reproductive age was 2.4%. The prevalence of HIV-infected individuals among hospital in-patients was 12.2%. HIV-infected individuals were found in every province. The prevalence of HIV was similar among married women of reproductive age in both the urban and rural areas. Comparison of HIV prevalence in the same risk groups monitored in previous years indicated that the prevalence of HIV is not declining in Cambodia and that Cambodia is among the most severely affected countries in Asia. It is estimated that 154,316 persons in Cambodia were infected in Spring 1998 based on the prevalence of HIV-infected individuals among blood donors.

The results of the survey indicate that the spread of HIV in Cambodia is continuing at a high rate and that the epidemic has spread beyond commercial sex workers, the probable reservoir of infection, and their clients, the probable bridge group for spread, to the general population in both urban and rural areas. Further, many HIV-infected individuals are now developing symptoms and signs of HIV disease and are seeking care. Recommendations for control of HIV/AIDS are made on the basis of the results of the fifth sentinel surveillance.

1998 REPORT ON HIV SENTINEL SURVEILLANCE IN CAMBODIA

BACKGROUND

Human immunodeficiency virus (HIV), the virus which causes acquired immunodeficiency syndrome (AIDS), has been spreading rapidly in the Kingdom of Cambodia since 1991, when an infected man was first detected at the National Blood Transfusion Center in Phnom Penh. The prevalence of HIV among blood donors in Phnom Penh in 1991 was 0.08%. In 1997, the cumulative number of people infected with HIV was estimated to be between 75,000-125,000. More than 90% of infections had probably been transmitted through heterosexual intercourse.

In 1992, the National AIDS Program, with support from the World Health Organization (WHO), conducted an unlinked anonymous serologic survey of selected risk groups in Phnom Penh. A total of 1017 specimens were collected. The proportion of commercial sex workers (CSWs) who tested positive for HIV antibodies was 9.2%, and the proportion of sexually transmitted disease (STD) patients who tested positive was 4.2%.

Reliable estimation and projection of HIV/AIDS patients are required to provide accurate information to the policy makers so that they can take effective measures to prevent further spread of the disease. In Cambodia, routine reporting of HIV/AIDS cases is not reliable. Surveillance data can make an important contribution to developing and implementing effective public health action, including advocacy, intervention design, and evaluation activities.

In 1994, the Cambodian Ministry of Health decided to initiate an active HIV/AIDS sentinel surveillance program with the support of the (WHO). Two goals were identified for the sentinel surveillance system. The first was to gather and analyze additional HIV and AIDS epidemiological information. The second was to elucidate the extent of the HIV epidemic in selected areas and among selected population groups. The first round was conducted in five provinces and included individuals from five different groups with high-risk behaviors (see Table 1). Three thousand five hundred samples were collected and tested. Due to inappropriate handling of the specimens, the results from only 464 samples could be reported in the first sentinel survey in 1994.

The second round of HIV Sentinel Surveillance in 1995 focused on high-risk populations in the hardest hit provinces in urban and easy-to-reach rural areas. At that time the program was financially and technically sponsored by WHO. The survey was conducted in nine provinces among eight target groups (see Table 1). Among pregnant women - who are considered to be a low- risk group - 2.6% were HIV antibody positive.

The third round of HIV sentinel surveillance in 1996 was sponsored by WHO and Family Health International (FHI). The sentinel site was expanded to 18 provinces (See Table 1). The survey focused on five risk groups. An increase in HIV antibody prevalence was observed among CSWs (from 37% to almost 50%), and among antenatal clinic attendees (from 2.5% to 3%). The provinces which were most affected were along the Thai border to the west and part of the south (Banteaymeanchey, Batambang, Pursat, Koh Kong, and Sihanoukville) and along the Vietnam/Laos border to the east (Rattanakiri).

In 1997, the fourth round of sentinel surveillance, sponsored by the United States Agency for International Development (USAID)/FHI, expanded nationwide (urban and rural) and focused on six target groups (see Table 1). The result of this surveillance indicated that Cambodia was one of the most severely HIV-affected countries in South-East Asia, with nearly 2% of the sexually active population infected with HIV. The HIV epidemic was expanding among groups of CSWs, their clients, and the general population. The Cambodian HIV epidemic, therefore, seemed to be transmitted predominantly through unprotected sex between men and women.

The experience of developing and implementing the surveillance program has highlighted several issues. These include: the need to continue to reassess and redefine the purpose of the surveillance system. It is challenging to implement a national system, which includes the provinces and rural areas. Methodological issues involving sampling and the need for informed consent also present difficulties.

In 1997, the surveillance results showed that the HIV prevalence among antenatal clinic attendees in some provinces was considerably higher than expected. Because some of the women were former CSWs who had been bought by the woodcutters to be their wives, this group included many women who should have been classified as CSWs.

OBJECTIVES OF SURVEILLANCE IN 1998

The objectives of the 1998 round of sentinel surveillance were:

1. To monitor the trend of the HIV epidemic among selected risk groups by area and over time
2. To provide reliable information for an estimation of the current number of HIV-infected persons and for projections of the HIV/AIDS epidemic in Cambodia in the future
3. To guide the development of effective HIV/AIDS intervention and prevention programs
4. To provide useful data to the government and other non-governmental organizations for planning health and medical care services

5. To mobilize national and international support for the HIV/AIDS prevention, control, and care programs in Cambodia

METHODOLOGY OF THE 1998 SURVEILLANCE

a. Scope and Coverage

It was decided for the fifth round of HIV sentinel surveillance, in 1998, to cover 19 provinces and villes (separately designated urban areas) (see Figure 1). In this fifth round, the sentinel groups included police, hospital in-patients, direct CSWs (brothel workers) and indirect CSWs (entertainment establishment girls and beer promotion girls), but antenatal clinic attendees were replaced by married women of reproductive age recruited through pediatric immunization clinics. Since the police and military groups had almost the same prevalence and risk behaviors, only one group - police - was included. Not all target groups, however, were included in every area. All CSWs registered in the survey were from urban populations. In the rural areas, specimens were collected only from married women of reproductive age. Provincial program managers were instructed to include married women of reproductive age from both rural and urban areas.

All 19 provinces selected collected samples from married women of reproductive age, police, direct CSWs and indirect CSWs, but only three provinces and villes collected from hospital in-patients. The targeted number of persons was not achieved in all the provinces.

b. Organization of the survey

The National Center for Dermatology, Venerology and HIV/AIDS Control (formerly the National AIDS Program) Manager was the survey team leader. Provincial AIDS program managers were responsible for implementing the survey in their own provinces under the supervision of the National Surveillance Unit. In each province there was one surveillance officer directly in charge of implementing the survey.

A pre-sentinel surveillance workshop for provincial program managers was held at the Ministry of Health, Phnom Penh, before the survey began, to provide technical and management support. All provincial program managers were invited to join the workshop. The material for sera collection was sent to some provinces and the remaining materials were given to participants from the other provinces after the workshop.

The National Center for Dermatology, Venerology and HIV/AIDS Control Manager organized a pre-sentinel surveillance workshop in each province. A health care worker at the district level joined that workshop and was responsible for selecting the appropriate staff people to conduct the survey.

In April 1998, the survey was initiated nationwide. A total of 176 staff members were hired for sera collection and 24 officials for supervision (five from the national program).

c. Survey design

The sentinel surveillance program used a serial cross-sectional design (prevalence survey) to monitor the spread and trend of HIV infection over time by target group and place. Each survey used an anonymous strategy. Five target groups were chosen for the survey:

- ! Direct CSWs
- ! Indirect CSWs
- ! Hospital in-patients
- ! Married women of reproductive age
- ! Police

Direct CSWs were randomly invited to participate until the desired sample size was reached. All indirect CSWs at randomly selected restaurants, beer companies, discotheques, and massage parlors in 19 provinces were asked to participate until the sample size was reached. All hospital in-patients in medical and surgery wards in only Battambang and Kampong Cham provinces and Phnom Penh were invited to participate until the required sample size was reached. The same applied to all married women of reproductive age in 19 provinces. In addition, 400 married women of reproductive age were selected only from rural areas of Battambang, Takeo, and Kratie Provinces until the sample size was reached.

d. Sample size

Sample sizes differed for the target groups. A sample of 150 CSWs was required in each province. One hundred fifty samples were to be collected from police, 400 from married women in urban areas of each province, and in three provinces another 400 samples from married women in rural areas were to be collected, as well. Only three provinces were required to collect 400 samples from hospital in-patients.

e. Data and sample collection and processing

After returning from the pre-sentinel surveillance workshop, each province had its sentinel sites mapped down to the district level. In some provinces, the program manager invited the staff involved to join a meeting to provide technical support. Other managers went directly to the district concerned and provided technical assistance to district staff. All staff involved from provincial levels and district levels were supposed to be qualified for collecting blood, coding, and registering. Sample collection at the district level was supervised by the provincial and national team, if necessary. Each province was required

to send half of the required specimens by the end of the first month to the National Center for Dermatology, Venerology and HIV/AIDS Control. In Chamkaloeu, Kampong Cham province, we encountered a high prevalence of HIV among married women of reproductive age. Therefore, it was decided that health care workers in Chamkaloeu should collect an additional 200 specimens from married women of reproductive age.

Information was collected from each participant on province/ville, date of specimen collection, age, and gender. Each participant was assigned a code number that was written on the information sheet and the blood specimen. All information on the data sheets was entered into the computer using EPIINFO and SPSS programs, including: exposure group, age, gender, province/ville, location, particle agglutination, and EIA test results. Two staff double-checked the data by randomly selecting some individuals in each target group.

Five milliliters of blood was collected for HIV testing from each individual using universal precautions (disposable syringes, gloves, cotton, alcohol, bleach, etc.). After separation of cells, 2 ml of serum was transferred to another tube for testing. For those provinces where Voluntary Testing Centers existed, sera were processed under the supervision of the national team.

Processing and testing of specimens:

All the sera were accumulated, processed, and temporarily stored at the district level until the required sample size was reached - if a cold chain was available. Otherwise, sera had to be stored in coolers and sent to the provincial laboratory within 24 hours for processing. The specimens were picked up by the supervision team or were sent to the national laboratory to be rechecked and stored for testing.

The same code number was placed on the blood tube and the data sheet. After separation, the serum was transferred from the blood tube to a cryotube labeled with the same code number as the blood tube.

Sera processing was conducted at the provincial level (Battambang, Siemreap and Kampong Cham) in the provinces in which voluntary testing centers existed, and at the national level for the sera from other provinces, by 15 lab technicians and three supervisors from the national program.

Provincial level: Collected blood specimens were stored at room temperature for three to four hours (if a centrifuge was not available) until cells and sera separated; sera was then transferred to another tube (cryotube) by using a separate Pasteur pipette. Sera were stored in the freezer or, if a freezer was not available, in a cooler box with ice.

National level: For transporting the sera from the provinces to Phnom Penh, a cooler box with ice was used. Sera were supposed to reach Phnom Penh within 24 hours after departure from the province. In Phnom Penh, all sera were stored in a freezer at the National Center for Dermatology, Venerology and HIV/AIDS Control.

All sera had to be sent to the National Center for Dermatology, Venerology and HIV/AIDS Control, which was responsible for final processing and storage, by June 30, 1998.

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 Immunosorbent Assay (Genelavia Mixt HIV 1/2). The results of the tests were marked on the same sheet for the particle agglutination and EIA assays.

RESULTS

Individuals infected with HIV were found in every province in which sentinel surveillance was conducted. The prevalence of HIV by sentinel group by age, gender, and location (urban/rural) is given in Table 3 and Figure 1. The prevalence was highest in female direct CSWs, at 42.6%, followed by indirect CSWs, at 19.1%. There was, however, probably some misclassification of indirect CSWs because they were classified by the establishment in which were interviewed and some of the indirect CSWs also either currently worked in brothels or had worked in them in the past. The prevalence among hospital in-patients in Battambang and Kampong Cham (the two biggest provinces) and Phnom Penh (the capital city) was 12.2%, indicating that the epidemic had progressed to the point where a significant number of individuals with HIV infection were becoming symptomatic and required treatment. The prevalence among police was 6.2%, and among married women of reproductive age was 2.4%. The highest prevalence of HIV infection was in direct CSWs 20-24 years of age, at 44.5%, although the prevalence among direct CSWs 15-19 years old was also high, at 41%. The sample sizes in some age groups, however, were very small. The tables giving age/gender prevalence by risk group for each province are included in the Appendix.

The prevalence of HIV-infected individuals in the five risk groups is given for each province in Table 4. There were some HIV-infected individuals in each sentinel group in every province in which that sentinel group was included. It is clear from Table 4 that the target number for each sentinel group in each province was not always met. In some of the provinces the number of individuals tested in some sentinel groups was as low as 20 individuals. Thus, some of the calculated prevalences have very wide confidence limits.

The prevalence of HIV-infected individuals in each sentinel group is given in Figures 3-8. The prevalences varied considerably within each sentinel group and by province. The provinces with the highest prevalences for one sentinel group were not always the same provinces that were high for the other sentinel groups. The prevalence among police was over twice as high in Koh Kong province as for any other province. The HIV prevalence among married women (Figure 7) was similar in the rural and urban areas, suggesting that the epidemic has now spread to the rural areas.

In order to estimate the total number of HIV infections in Cambodia we used the prevalence of HIV among blood donors, realizing that some of the blood donors were

paid donors and, therefore, somewhat more likely to be infected than volunteer donors. The prevalence of HIV- infected individuals among female blood donors 15-49 years old was 2.5% and among male blood donors was 4.1%. To generate a A_{low} estimate we multiplied the prevalence of female HIV-infected donors 15-49 years old times the estimated population of individuals in Cambodia in 1998 15-49 years old (Table 5). To generate a A_{high} estimate we multiplied the female prevalence rate times the estimated number of females and the male prevalence rate times the estimated number of males 15-49 years old. These calculations assume that there are no HIV-infected individuals above 49 years old and below 15 years old. They also do not adjust for the proportion of paid versus volunteer donors. The A_{low} calculations gave an estimate of 133,695 HIV-infected persons and the A_{high} calculations gave an estimate of 174,937 HIV-infected persons. The mean between the high and the low was 154,316 persons estimated to be HIV-infected in Cambodia as of Spring 1998.

In order to develop projections for the epidemic in Cambodia in the coming several years, we decided to use the WHO/GPA Epimodel. We selected 1989 as the base year when HIV was introduced into Cambodia. The first infection had been diagnosed in a blood donor in 1991. We used 1998 as the reference year and used the middle estimate (154,316) as the number of HIV-infected individuals in the country at that time. To decide at which point to place the reference year we developed the median values for HIV prevalence in women less than 21 years attending antenatal clinics in the 19 provinces which had data for 1996, 1997, and 1998. In 1998, antenatal clinic attendees were not included so that we had to use married women, most of whom had been recruited from well-baby and vaccination clinics. Since these women would have been exposed to sexual intercourse for less than two years on average, we reasoned that they would provide the best estimate of incidence of HIV. The highest rate was in 1998. We assumed, therefore, that the peak year of the epidemic had not yet been reached. Using the same technique to look at prevalences among women 21-29 years, which does not represent incidence, we observed that the peak prevalence was in 1997, but the difference between 1997 and 1998 was minimal. We, therefore, arbitrarily decided to set the position on the curve that resulted in the peak of the HIV epidemic occurring in the year 2000. We then generated the estimates of HIV and AIDS based on the model using these assumptions and those listed on Table 6. The results of the model are shown in Figure 9 and Table 7.

Finally, we identified the number of women 15-49 years old in Cambodia (2,770,155) as the maximum number of women at risk for HIV infection. The number of female CSWs was estimated to be 20,000. Multiplying the prevalences in these two groups times the estimated population, we estimated that 69,254 women who were not CSWs and 8,520 women who were CSWs were currently infected, underscoring the relative magnitude of HIV infection in the two groups (Figure 10). The female CSWs, however, may be the reservoir of infection and the clients the bridge between them and the general population of sexually active women.

LIMITATIONS OF THE STUDY

Both sampling errors and non-sampling errors may have affected the accuracy of extrapolation from the study. The samples of all target groups, except hospital in-patients, were considered to be from urban areas. However, some of them were collected from districts, communes, or villages. The results of HIV tests that were recorded consisted of negative, indeterminate, and positive cases. Only positive cases were counted in the analysis; indeterminate tests were not confirmed by a third test. Errors may have occurred in reporting age and while entering data.

Other problems included:

- ! Difficulties in achieving the targeted number of specimens in some areas, resulting in unstable rates which make trend analysis difficult
- ! The possible misclassification of indirect CSWs who are also part-time direct CSWs
- ! The small proportion (20%) of pregnant women in Cambodia who attend antenatal clinics indicating that data from these women are probably not representative of all pregnant women (especially in the rural areas)
- ! Deletion and addition of sentinel groups in subsequent years making analysis of trends impossible
- ! The lack of differentiation between volunteer and paid blood donors (paid donors usually have higher HIV rates than volunteer donors)
- ! The difficulty of collecting, processing, and transporting blood specimens which must be kept cold, possibly resulting in erroneous laboratory determinations
- ! The relatively few samples collected from rural areas (those areas which were sampled suggest that the rates in rural areas are approaching those found in urban areas)
- ! The prevalence of HIV in some risk groups in some of the provinces has been zero while in other provinces the same risk groups have had high prevalences, making the means and computer generated medians for these risk groups misleading

Thus, the results of the surveillance findings, and estimates derived from them, should be viewed cautiously.

CONCLUSIONS

Based on the results of surveillance, the estimates of the number of HIV-infected individuals, and the results of using the model, we developed the following conclusions:

- ! HIV prevalence is still high in all risk groups and will remain high for at least several more years.
- ! The number of new HIV infections will continue to be high for several more years.
- ! Many HIV-infected individuals are now symptomatic and are seeking care.
- ! There are eight times as many women who are not CSWs infected with HIV as female CSWs who are infected. CSWs and their clients, however, are the major source of HIV spread in Cambodia.
- ! There may be 138 times as many women who are not CSWs who are at risk of HIV infection as female CSWs
- ! Husbands who have other sex partners represent the greatest risk for HIV infection for married women in Cambodia.
- ! The prevalence of HIV infection in rural areas now appears to be similar to that in urban areas.

RECOMMENDATIONS

Considering the data, the estimates, the projections, and the conclusions, we have made the following recommendations for consideration for future control efforts in Cambodia:

- ! Current intervention strategies need to be expanded and evaluated. New intervention strategies, particularly those aimed at the Abridge groups \cong (groups transmitting HIV from the reservoirs to the susceptibles), need to be initiated.
- ! STD case finding and treatment services need to be improved and extended.
- ! HIV/AIDS education and intervention must be introduced into the school curriculum. In order to include the majority of students before they leave school, this program should be introduced in the elementary schools and continued in the high schools.
- ! Intervention activities and resources need to be extended to rural areas as well as urban areas.
- ! To evaluate the impact of intervention strategies and to predict the future of the epidemic, behavioral surveillance needs to be continued.
- ! In order to protect women from HIV infection, intensified efforts need to be made to reduce transmission of HIV from CSWs to their clients, as well as from infected clients to their wives.
- ! Cambodian men must take responsibility for protecting their wives from being infected with HIV.

APPENDIX

(Tables A1-A19)

Figure 1: HIV sentinel surveillance sites in Cambodia, 1998

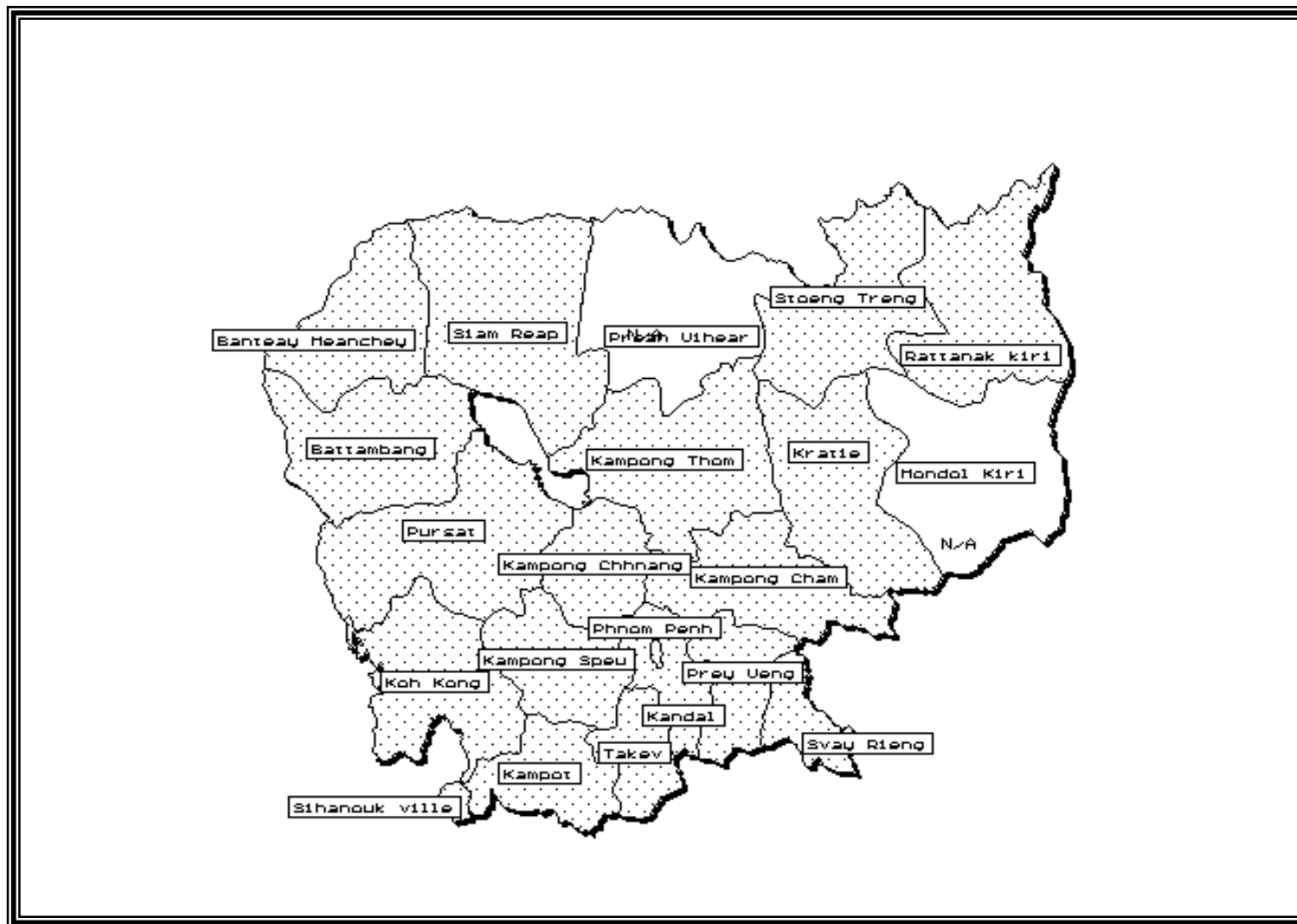
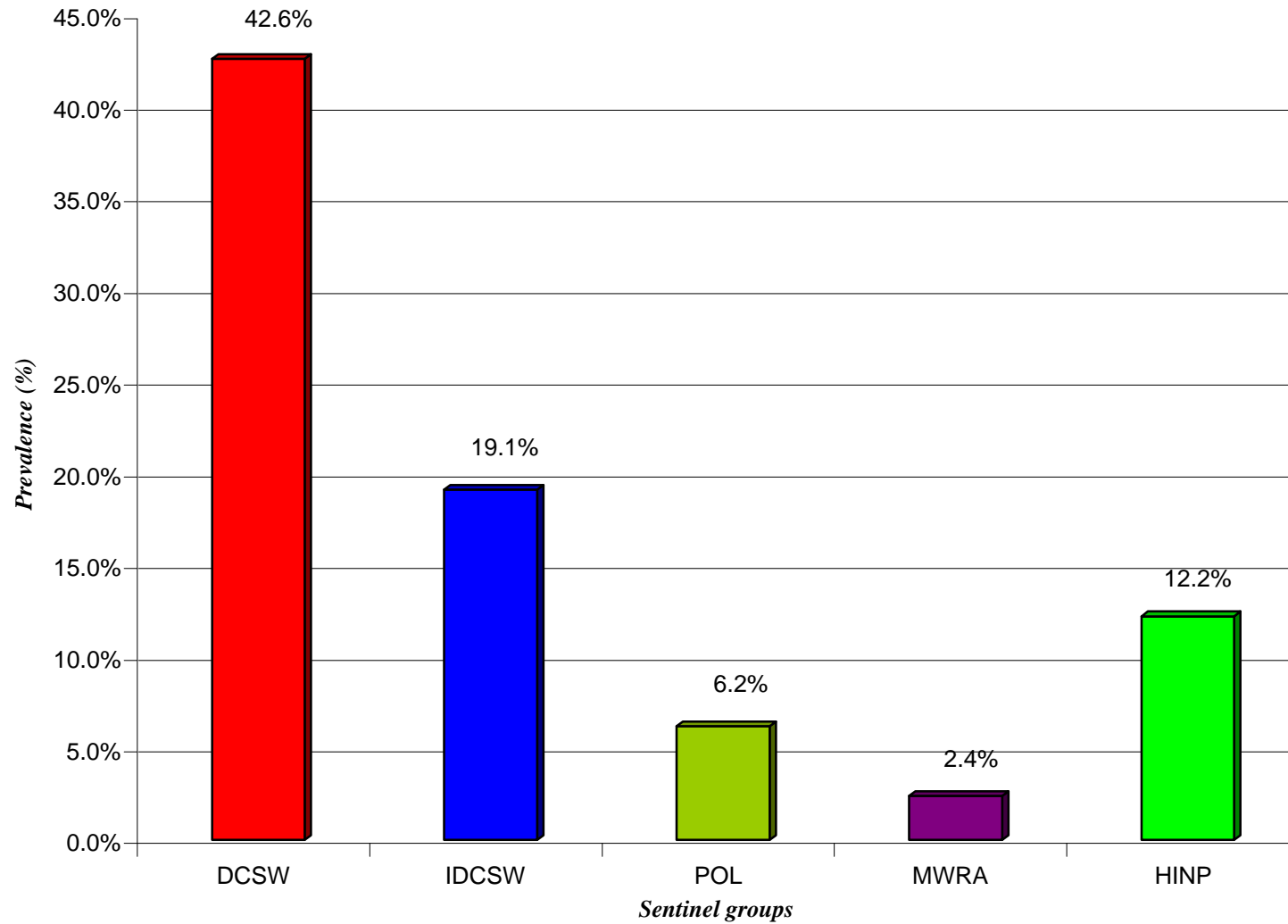
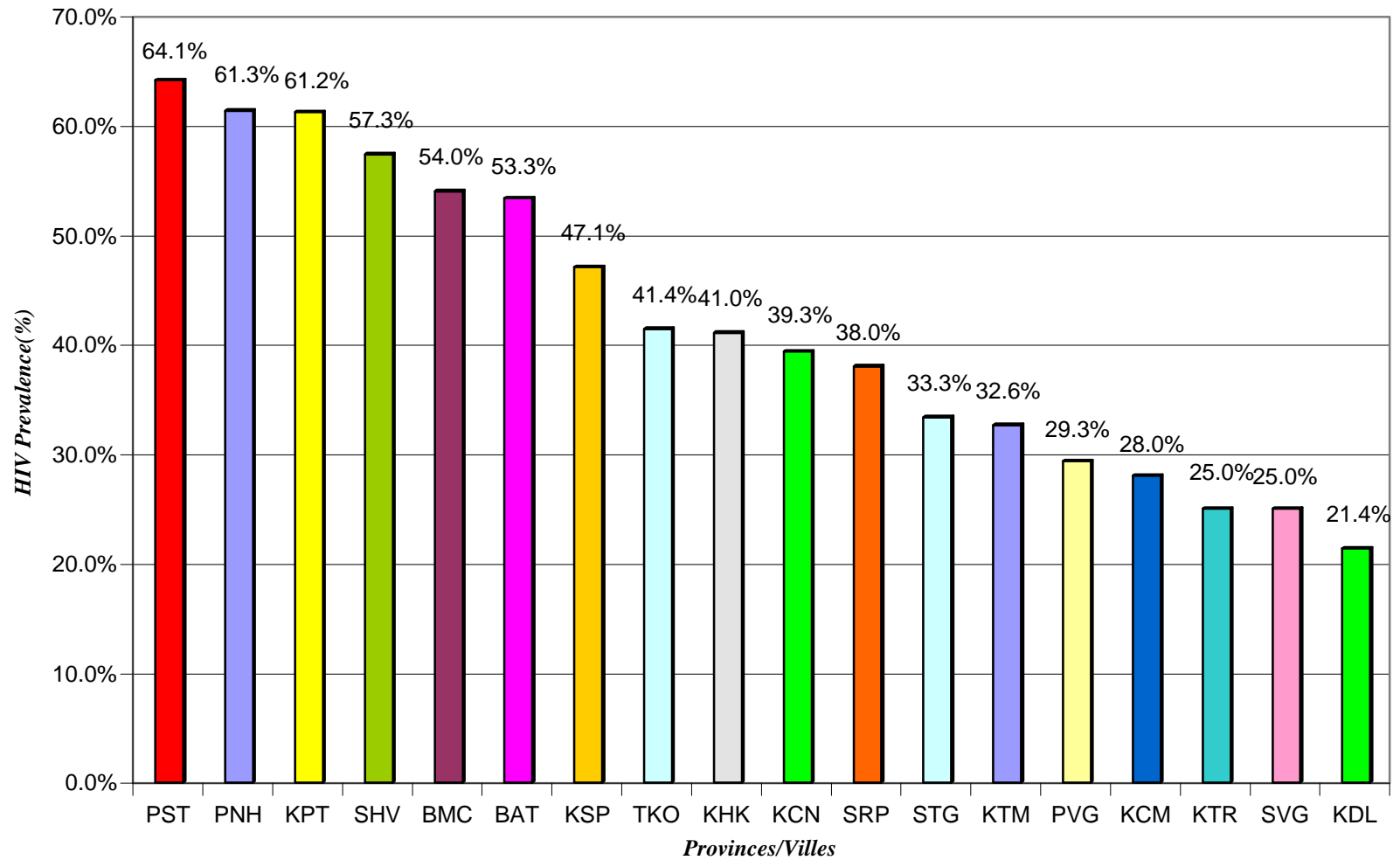


Figure 2: HIV seroprevalence among sentinel groups in Cambodia, 1998



**Figure 3: HIV seroprevalence among direct commercial sex workers
in Cambodia, 1998**



**Figure 4: HIV seroprevalence among indirect commercial sex workers
in Cambodia, 1998**

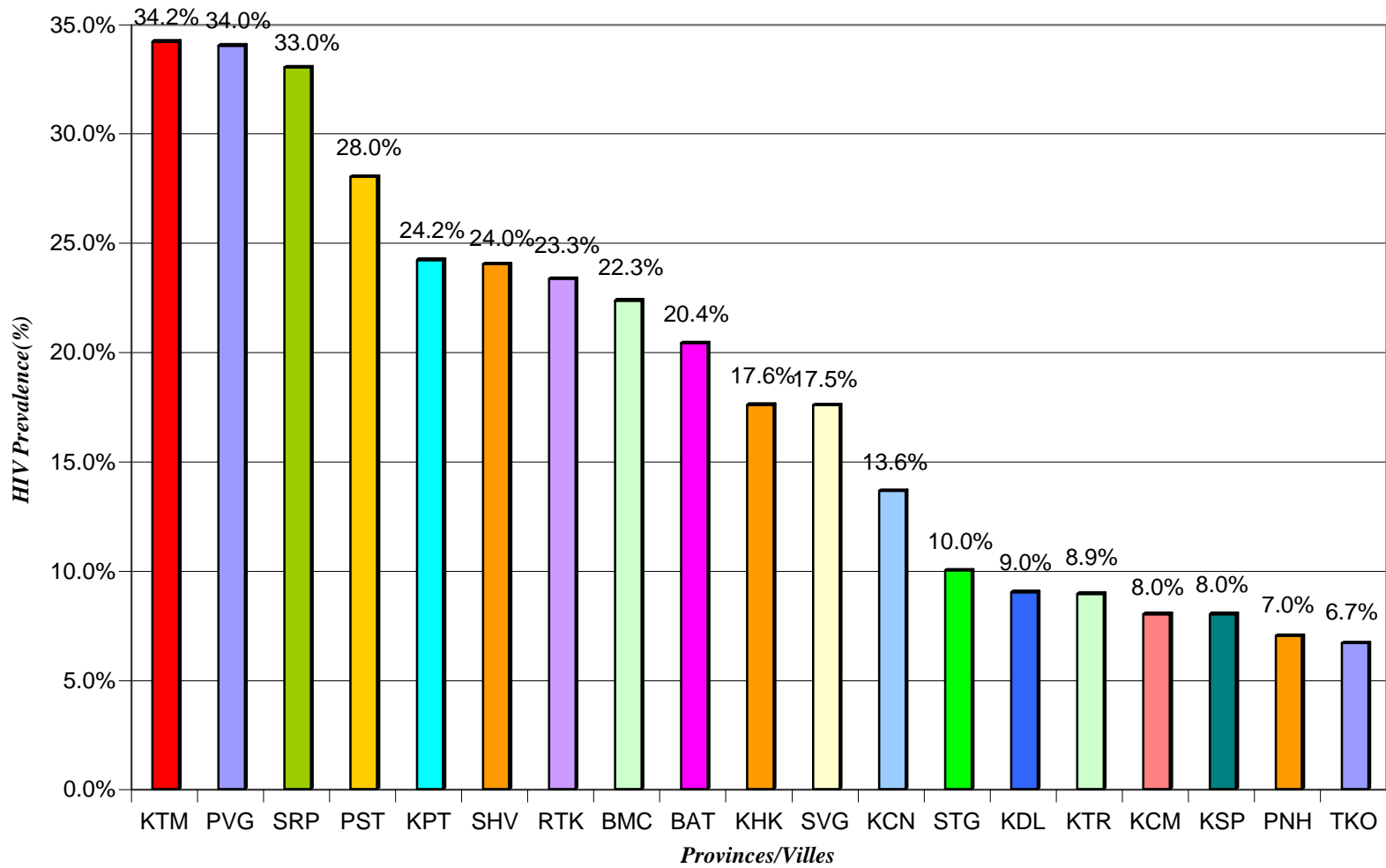


Figure 5: HIV seroprevalence among police in Cambodia, 1998

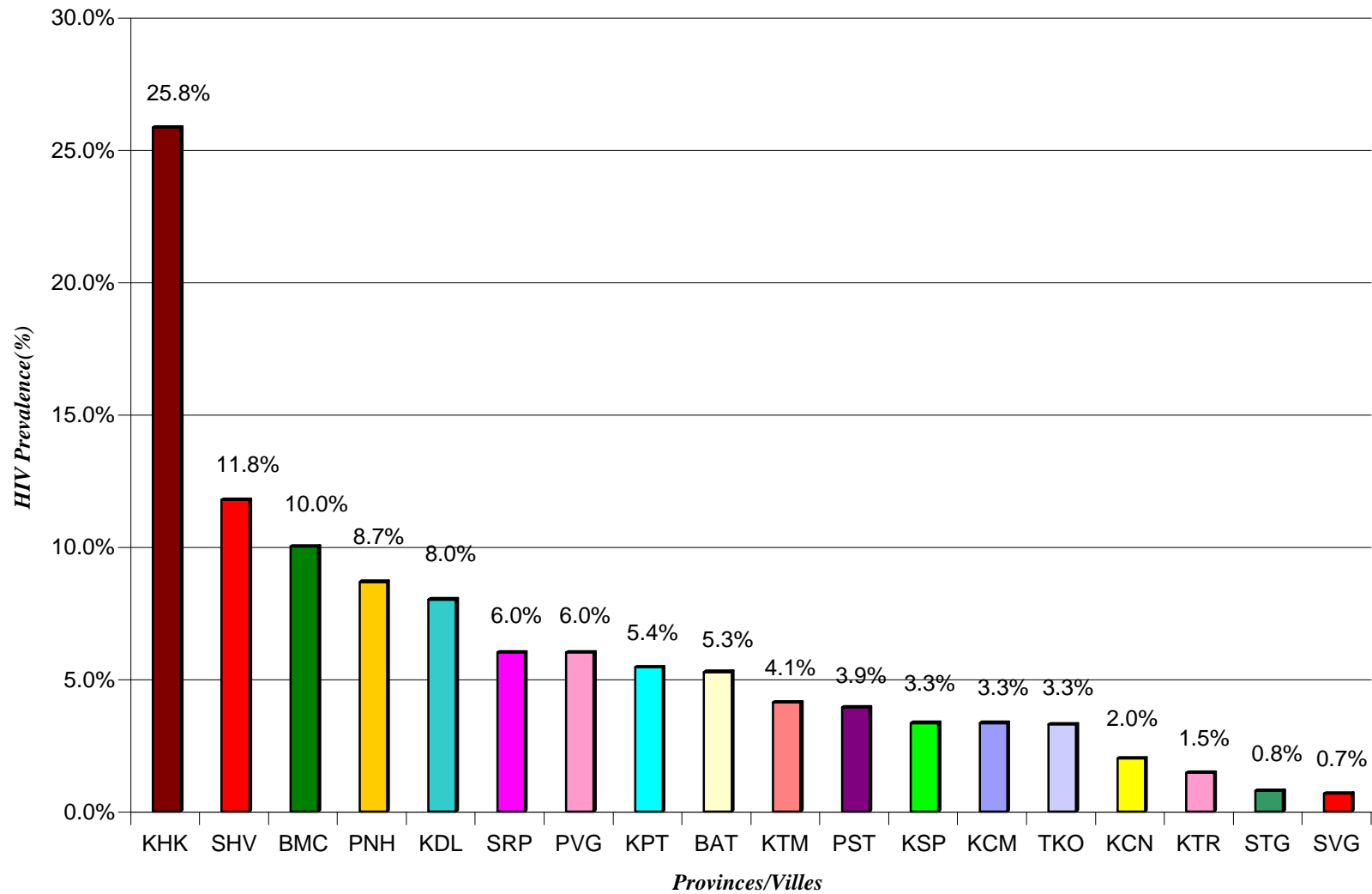


Figure 6: HIV seroprevalence among married women in Cambodia, 1998

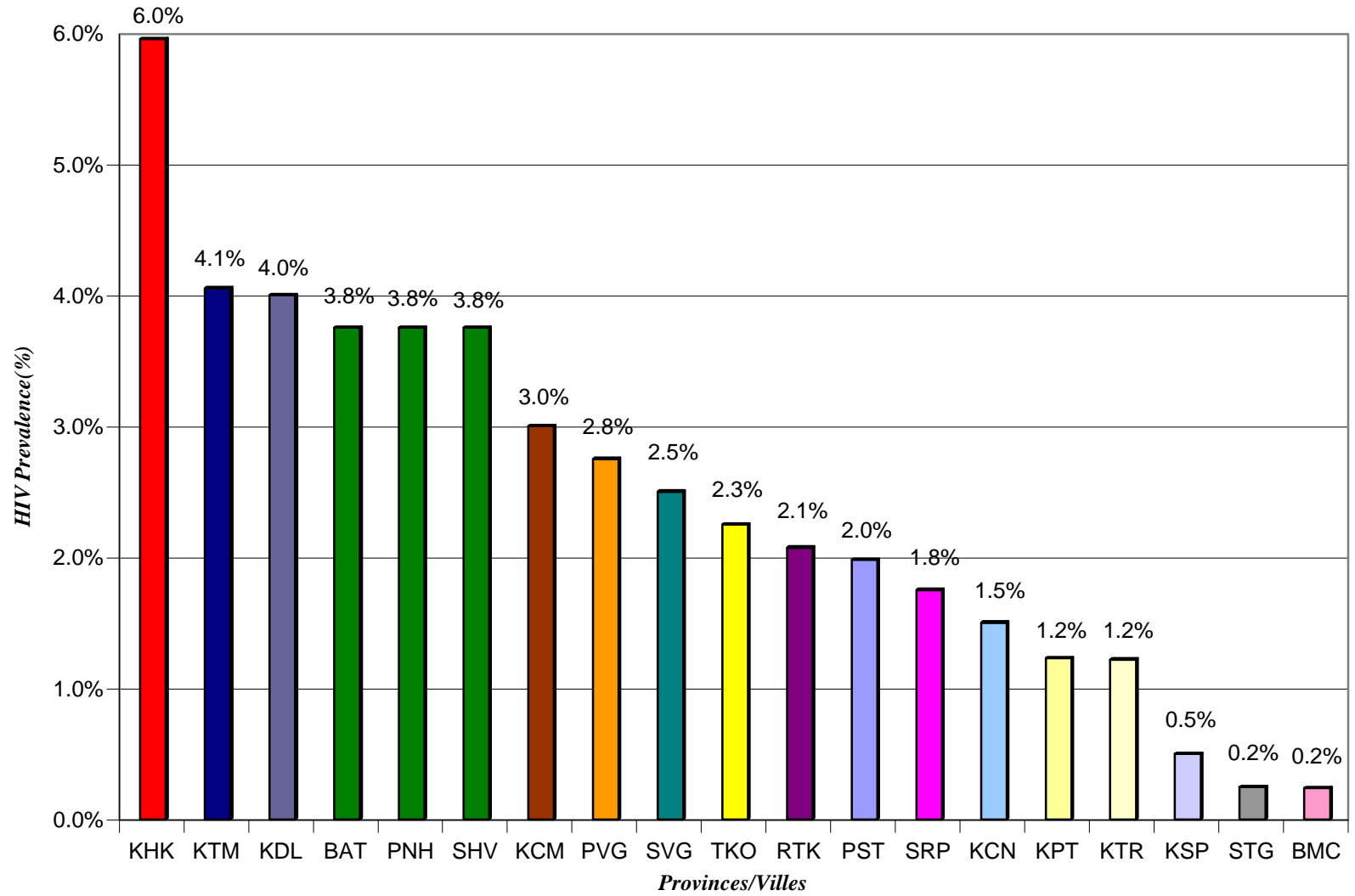


Figure 7: HIV seroprevalence among married women in Cambodia, 1998
urban versus rural areas

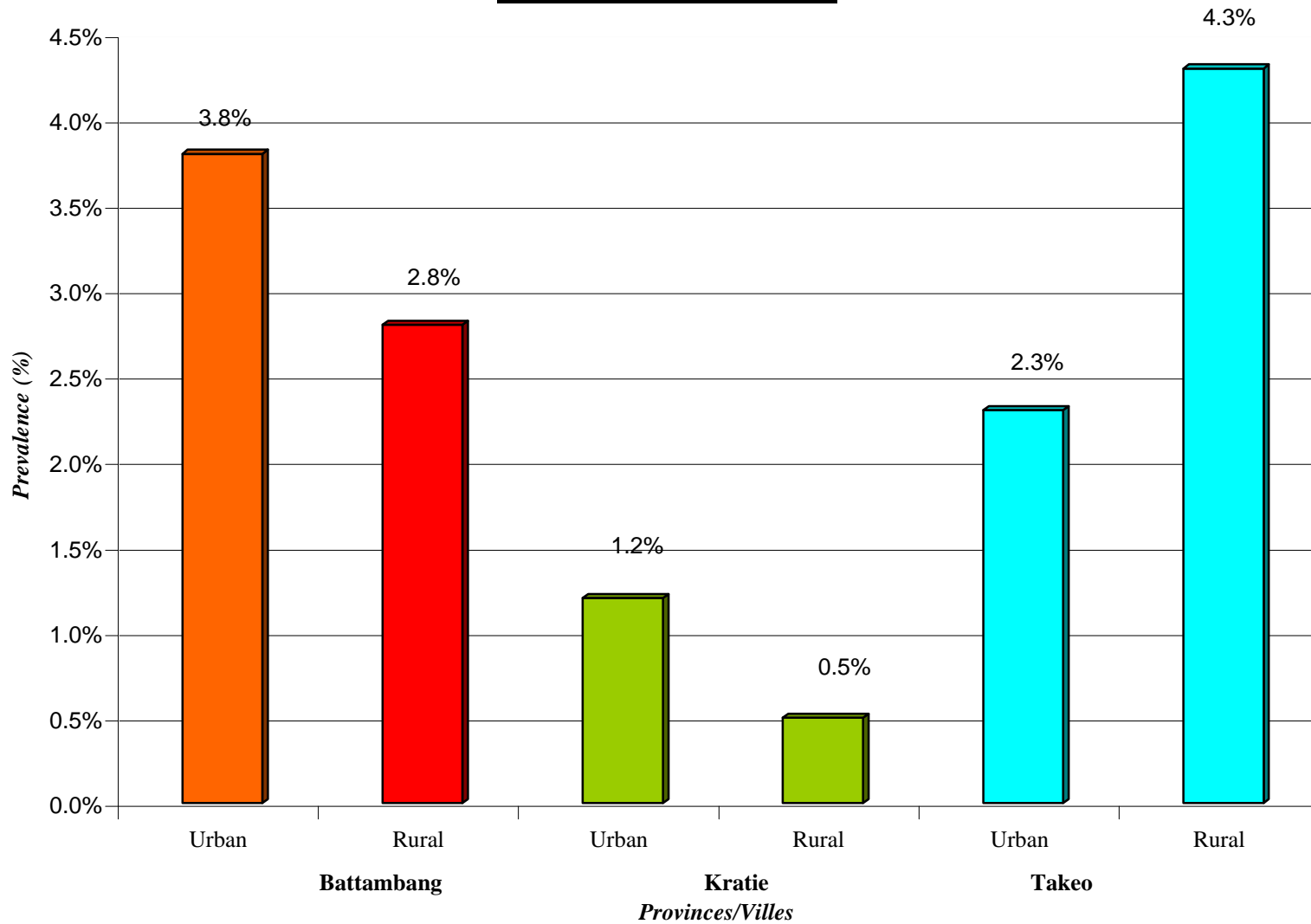
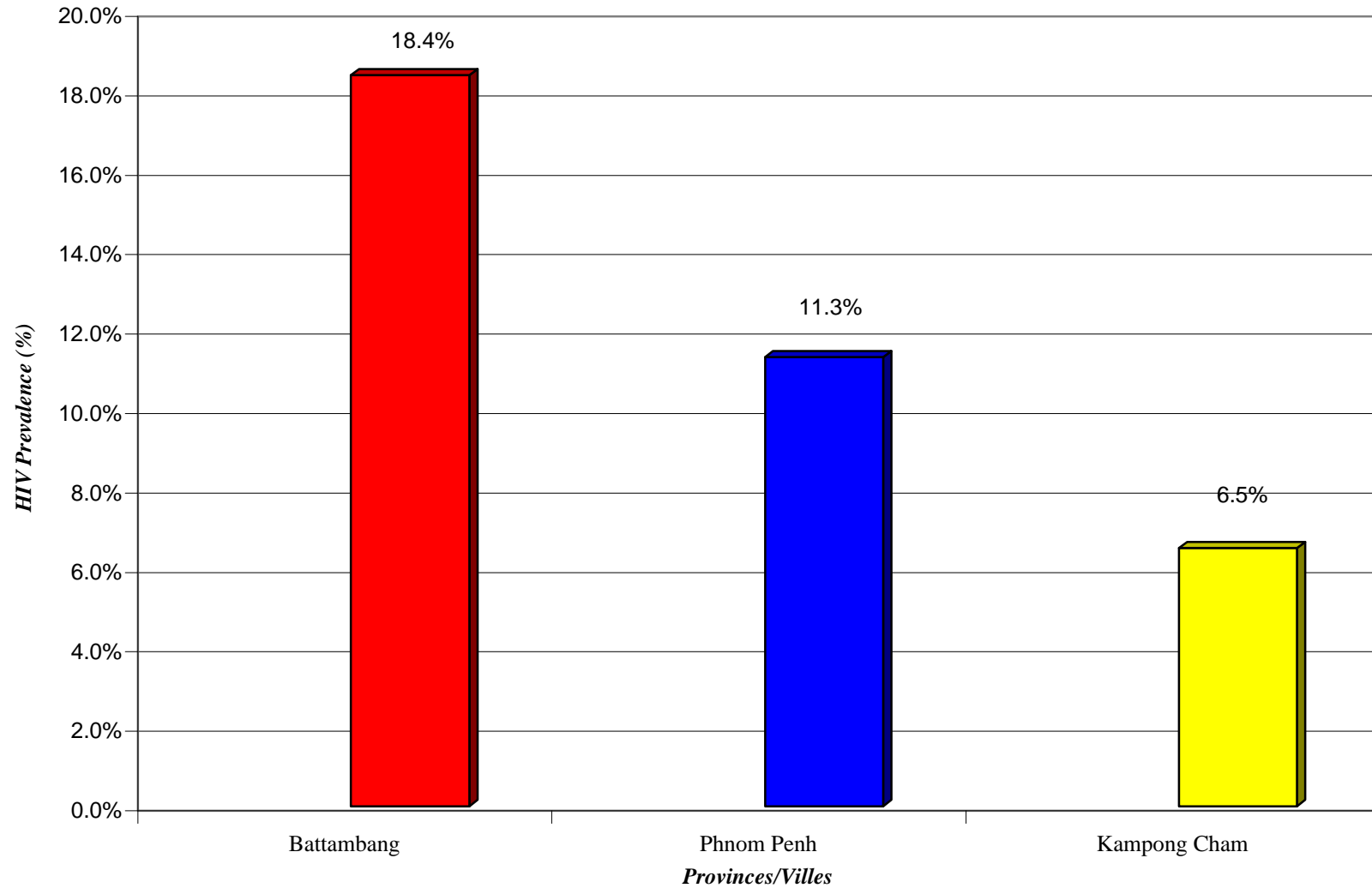


Figure 8: HIV seroprevalence among hospital in-patients in Cambodia, 1998



**Figure 9: Estimates and projections of HIV infections and AIDS cases in Cambodia
1999 - 2003**

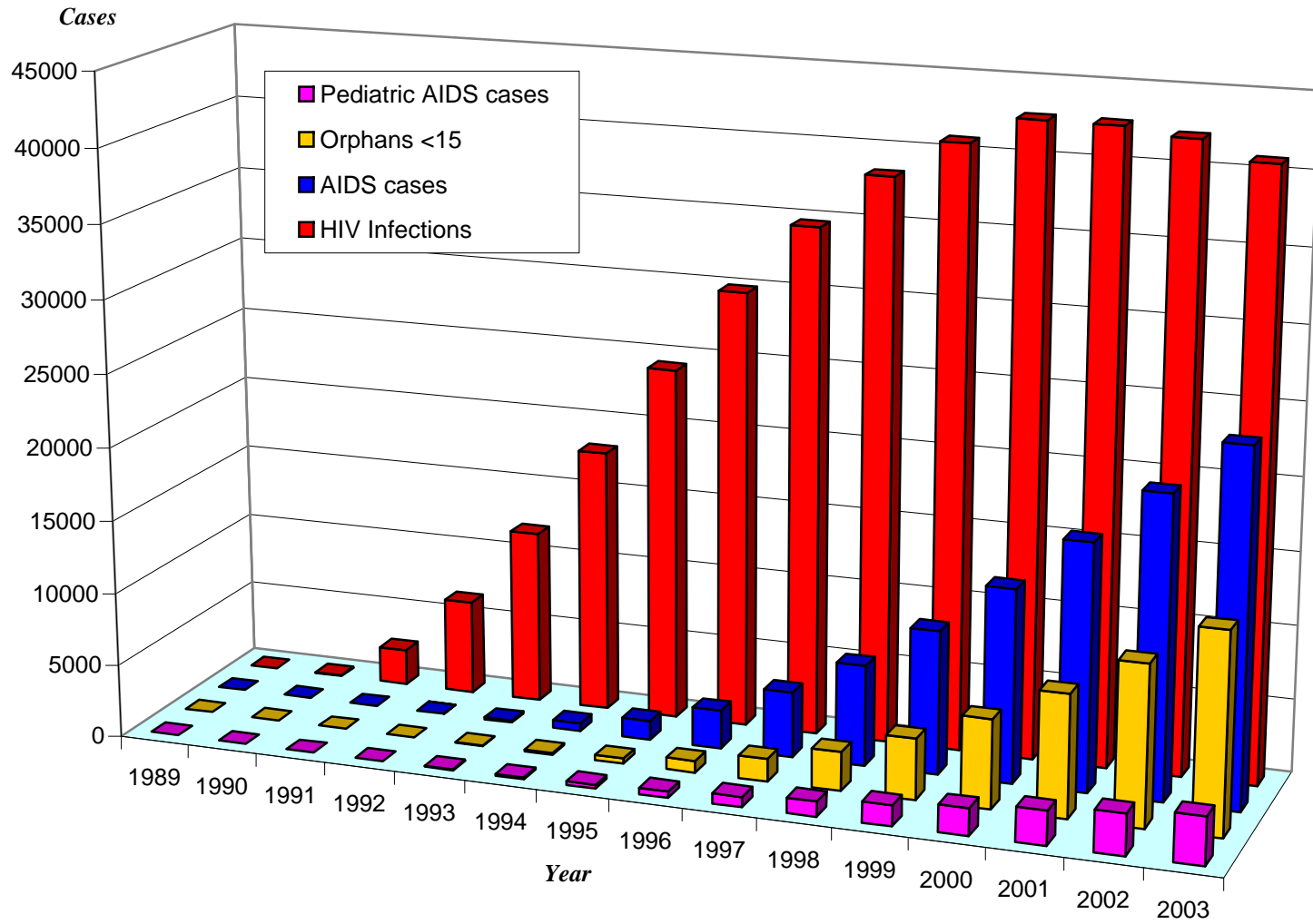


Figure 10: Women 15-49 years with HIV infection and at risk of HIV infection

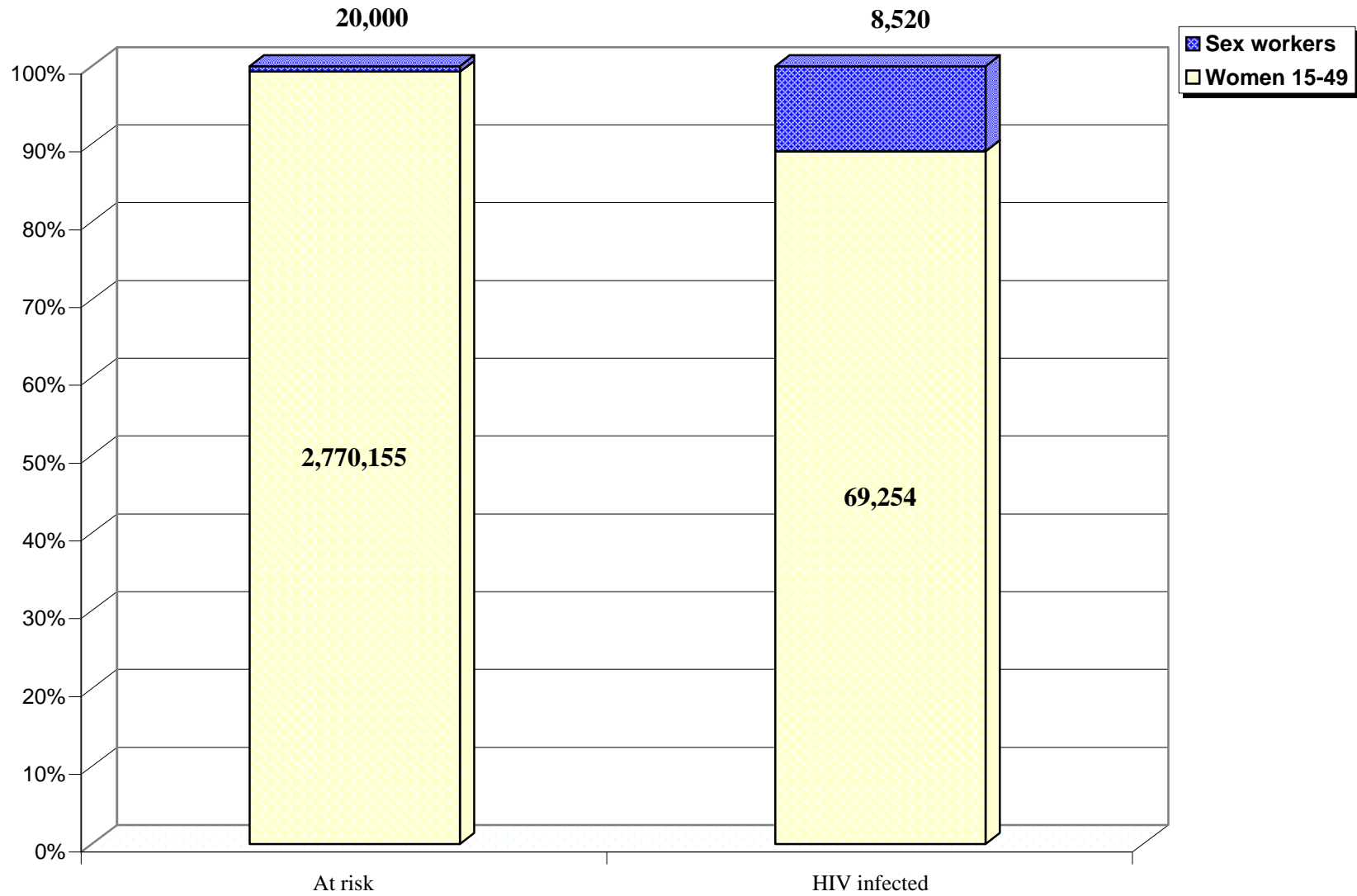


Table 1: Summary of sentinel sites and groups for the National HIV Sentinel Surveillance program in Cambodia, 1994-1997

YEAR	1992	1993	1994	1995	1996	1997	1998
SITE	-PHN	No survey	-PNH -BMC -BTB -SHV -SRP	-PNH -BMC -BTB -SHV -SRP -KDL -KHK -PST -RTK	-PNH -BMC -BTB -SHV -SRP -KDL -KHK -PST -RTK -KCM -KCN -KPT -KRT -KSP -PVG -STG -SVG -TKO	-PNH -BMC -BTB -SHV -SRP -KDL -KHK -PST -RTK -KCM -KCN -KPT -KRT -KSP -PVG -STG -SVG -TKO -KEP -MDK -PVH	-PNH -BMC -BTB -SHV -SRP -KDL -KHK -PST -RTK -KCM -KCN -KPT -KRT -KSP -PVG -STG -SVG -TKO - - -
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

NOTE:

-DCSW: Direct commercial sex workers
 -TB: Tuberculosis patients
 -POL: Police personnel
 -MIL: Military personnel
 -ANC: Antenatal clinic attendees
 -STD: Sexually transmitted diseases patients
 -IDCSW: Indirect commercial sex workers
 -MWRA: Married women of reproductive age
 -HIPT: Hospital in-patients

-PNH: Phnom Penh
 -BMC: Banteay Meanchey
 -BTB: Battambang
 -SHV: Sihanouk ville
 -SRP: Siem Reap
 -KDL: Kandal
 -KHK: Koh Konh
 -PST: Pursat
 -RTK: Rattanak kiri
 -KCM: Kampong Cham
 -KCN: Kampong Chhnang
 -KPT: Kampot
 -KRT: Kratie
 -KSP: Kampong Speu
 -PVG: Prey Veng
 -STG: Stung Treng
 -SVG: Svay Rieng
 -TKO: Takeo
 -KEP: Kep
 -MDK: Mundul kiri
 -PVH: Preah Vihea

Table 2: Summary of HIV prevalence rates in sentinel groups, 1992-1997

Sentinel groups	Year									
	1992		1994		1995		1996		1997	
	Sample	%	Sample	%	Sample	%	Sample	%	Sample	%
Direct commercial sex workers	207	9	213	39	1007	38	1859	40.9	1132	39.3
Tuberculosis patients	N/A		N/A		602	2.5	1826	3.9	1035	5
Police personnel	240	0	N/A		954	8	1775	5.5	1325	6
Military personnel	200	0	N/A		1013	5.9	1429	5.9	1249	7.1
Antenatal clinic attendees	195	0	N/A		870	2.6	3429	1.7	5003	3.2
Sexually transmitted diseases patients	805	4	1072	9	N/A		N/A		N/A	
Indirect commercial sex workers	N/A		N/A		549	25.3	N/A		N/A	
Hospital in-patients	N/A		N/A		N/A		N/A		1155	6

N/A: not available

Table 3: HIV seroprevalence by age, sex, and location among sentinel groups in Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples	16344	3350	12994	15144	1200	9	1754	3343	3631	2971	2123	1404	828	281	
Positive cases	1754	251	1503	1724	30	1	367	623	362	225	95	52	21	8	
Groups															
DCSW	Sample	2284	0	2284	2284	0	5	708	978	414	136	38	5	0	0
	Posit.	973		973	973		1	290	435	171	60	14	2		
	Prev.	42.6%		42.6%	42.6%		20.0%	41.0%	44.5%	41.3%	44.1%	36.8%	40.0%		
IDCSW	Sample	1358	0	1358	1358	0	0	321	618	337	74	7	1	0	0
	Posit.	260		260	260			60	114	66	19	1	0		
	Prev.	19.1%		19.1%	19.1%			18.7%	18.4%	19.6%	25.7%	14.3%	0.0%		
POL	Sample	2650	2638	12	2650	0	0	23	157	646	684	519	360	184	77
	Posit.	165	164	1	165			0	12	49	43	30	19	9	3
	Prev.	6.2%	6.2%	8.3%	6.2%			0.0%	7.6%	7.6%	6.3%	5.8%	5.3%	4.9%	3.9%
MWRA	Sample	8879	0	8879	7679	1200	0	572	1437	2047	1872	1408	929	535	79
	Posit.	213		213	183	30		13	43	48	62	25	15	6	1
	Prev.	2.4%		2.4%	2.4%	2.5%		2.3%	3.0%	2.3%	3.3%	1.8%	1.6%	1.1%	1.3%
HINP	Sample	1173	712	461	1173	0	4	130	153	187	205	151	109	109	125
	Posit.	143	87	56	143		0	4	19	28	41	25	16	6	4
	Prev.	12.2%	12.2%	12.1%	12.2%		0.0%	3.1%	12.4%	15.0%	20.0%	16.6%	14.7%	5.5%	3.2%

Posit.: positive

Prev.: prevalence

Table 4: HIV seroprevalence among sentinel groups in the 1998 Sentinel Surveillance, Cambodia

Code	Provinces/Ville	Sentinel groups																				
		DCSW			IDCSW			POL			HINP			MWRA								
		Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Urban			Rural			Urban + Rural		
Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.	Samp.	Posi.	Prev.		
1	Banteay Meanchey	202	109	54.0%	94	21	22.3%	160	16	10.0%				420	1	0.2%				420	1	0.2%
2	Battambang	150	80	53.3%	103	21	20.4%	152	8	5.3%	402	74	18.4%	400	15	3.8%	400	11	2.8%	800	26	3.3%
3	Kampong Cham	150	42	28.0%	100	8	8.0%	150	5	3.3%	371	24	6.5%	600	18	3.0%				600	18	3.0%
4	Kampong Chhang	150	59	39.3%	88	12	13.6%	150	3	2.0%				400	6	1.5%				400	6	1.5%
5	Kampong Speu	119	56	47.1%	25	2	8.0%	150	5	3.3%				400	2	0.5%				400	2	0.5%
6	Kampong Thom	95	31	32.6%	79	27	34.2%	146	6	4.1%				395	16	4.1%				395	16	4.1%
7	Kampot	67	41	61.2%	62	15	24.2%	147	8	5.4%				407	5	1.2%				407	5	1.2%
8	Kandal	103	22	21.4%	100	9	9.0%	150	12	8.0%				400	16	4.0%				400	16	4.0%
9	Kep																					
10	Koh Kong	134	55	41.0%	74	13	17.6%	151	39	25.8%				252	15	6.0%				252	15	6.0%
11	Kratie	100	25	25.0%	56	5	8.9%	137	2	1.5%				410	5	1.2%	400	2	0.5%	810	7	0.9%
12	Mundul Kiri																					
13	Phnom Penh	150	92	61.3%	100	7	7.0%	150	13	8.7%	400	45	11.3%	400	15	3.8%				400	15	3.8%
14	Preah Vihear																					
15	Prey Veng	150	44	29.3%	100	34	34.0%	150	9	6.0%				400	11	2.8%				400	11	2.8%
16	Pursat	131	84	64.1%	25	7	28.0%	153	6	3.9%				404	8	2.0%				404	8	2.0%
17	Ratanak Kiri	33	7	21.2%	30	7	23.3%							386	8	2.1%				386	8	2.1%
18	Siem Riep	150	57	38.0%	100	33	33.0%	150	9	6.0%				400	7	1.8%				400	7	1.8%
19	Sihanouk Ville	150	86	57.3%	100	24	24.0%	153	18	11.8%				400	15	3.8%				400	15	3.8%
20	Stung Treng	51	17	33.3%	20	2	10.0%	129	1	0.8%				405	1	0.2%				405	1	0.2%
21	Svay Rieng	100	25	25.0%	57	10	17.5%	150	1	0.7%				400	10	2.5%				400	10	2.5%
22	Takeo	99	41	41.4%	45	3	6.7%	122	4	3.3%				400	9	2.3%	400	17	4.3%	800	26	3.3%
Total		2284	973	42.6%	1358	260	19.1%	2650	165	6.2%	1173	143	12.2%	7679	183	2.4%	1200	30	2.5%	8879	213	2.4%

Total samples: 16344



Not available



No survey

Samp.: sample; Posi.: positive; Prev.: prevalence

Positive samples: 1754

Table 5 : Estimation of HIV prevalence in Cambodia, 1998

<u>Total population</u>		11,258,504
	Age group 15 - 49 years old	5,347,789
	Male: 48.20%	2,577,634
	Female: 51.80%	2,770,155
<u>Assumptions</u>		
Low range:		
	The HIV prevalence among women blood donors 15-49 is representative of the sexually active population 15 - 49 years old (Blood bank 98)	
	2.50% among female sexually active population 15-49	69,254
	2.50% among male sexually active population 15-49	64,441
	Total	<u><u>133,695</u></u>
High range:		
	The HIV prevalence among women blood donors 15-49 is representative of the female sexually active population 15 - 49 years old (Blood bank 98)	
	2.50% among female sexually active population 15-49	69,254
	The HIV prevalence among male blood donors 15-49 is representative of the male sexually active population 15 - 49 years old (Blood bank 98)	
	4.10% among male sexually active population 15-49	105,683
	Total	<u><u>174,937</u></u>
Medium range:		
	Total	<u><u>154,316</u></u>

National estimate ~ 150 000 HIV infected persons

Table 6: Parameters used in Epimodel

Base year: 1989

Estimated number infected in reference year, 1998: 150,000

Curve: Gamma, value 5, position 252

Population: 5,347,789 in 1998 growing at 2.6% per year

Scenario: HIV incidence will peak in year 2000

Progression rate: 50% of HIV infected individuals will develop AIDS in 8 years

Mother to child transmission rate: 33%

Table 7: Estimated number of adults and children living with HIV/AIDS, end of 1998

These estimates include all people with HIV infection, whether or not they have developed symptoms of AIDS, alive at the end of 1998

Adults (15-49) years and children (0-15) years	152,221
Adult - males	80,746
Adult - females	69,254
Children	2,221
Prevalence among adults 15-49 years	2.8%

Estimated number of AIDS cases

Estimated number of AIDS cases in adults and children that have occurred since the beginning of the epidemic:

Cumulative no. of AIDS cases	18,612
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Estimated number of deaths due to AIDS

Estimated number of adults and children who died of AIDS since the beginning of the epidemic:

Cumulative no. deaths	15,118
Deaths in 1998	6,689

Estimated number of orphans

Estimated number of uninfected children who have lost their mother or both parents to AIDS (while they were under age 15) since the beginning of the epidemic:

Cumulative no. orphans	5,505
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Table A.1

HIV seroprevalence by age, sex, and location among sentinel groups in Banteay Meanchey province Cambodia, 1998

Total			Sex		Location		Age group(years)							
			Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Samples	876	160	716	876	0	0	165	180	143	125	98	77	73	15
Positive Cases	147	16	131	147	0	0	58	51	29	4	2	1	1	1
Groups														
DCSW	Sample	202	0	202	202	0	0	105	73	23	1	0	0	0
	Posit.	109		109	109			52	38	18	1			
	Prev.	54.0%		54.0%	54.0%			49.5%	52.1%	78.3%	100.0%			
IDCSW	Sample	94	0	94	94	0	0	41	28	15	6	3	1	0
	Posit.	21		21	21			6	8	4	2	1	0	
	Prev.	22.3%		22.3%	22.3%			14.6%	28.6%	26.7%	33.3%	33.3%	0.0%	
POL	Sample	160	160	0	160	0	0	3	31	34	32	23	18	13
	Posit.	16	16		16			0	5	7	0	1	1	1
	Prev.	10.0%			10.0%			0.0%	16.1%	20.6%	0.0%	4.3%	5.6%	7.7%
MWRA	Sample	420	0	420	420	0	0	16	48	71	86	72	58	60
	Posit.	1		1	1			0	0	0	1	0	0	0
	Prev.	0.2%		0.2%	0.2%			0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%

Posit.: positive
Prev.: prevalence

DCSW: direct commercial sex workers
IDCSW: indirect commercial sex workers
POL: police
MWRA: married women of reproductive age
HIPN: hospital in-patients

Table A.2

HIV seroprevalence by age, sex, and location among sentinel groups in Battambang province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	1607	425	1182	1207	400	0	160	310	341	325	214	122	98	37
Positive Cases	209	57	152	198	11	0	24	73	40	39	16	10	6	1
Groups														
DCSW	Sample	150	0	150	150	0	0	40	87	18	5	0	0	0
	Posit.	80		80	80			19	47	10	4			
	Prev.	53.3%		53.3%	53.3%			47.5%	54.0%	55.6%	80.0%			
IDCSW	Sample	103	0	103	103	0	0	27	35	39	2	0	0	0
	Posit.	21		21	21			2	9	9	1			
	Prev.	20.4%		20.4%	20.4%			7.4%	25.7%	23.1%	50.0%			
POL	Sample	152	152	0	152	0	0	1	4	39	41	23	16	11
	Posit.	8	8		8			0	1	3	2	0	0	2
	Prev.	5.3%			5.3%			0.0%	25.0%	7.7%	4.9%	0.0%	0.0%	18.2%
MWRA	Sample	800	0	800	400	400	0	35	124	189	202	130	73	45
	Posit.	26		26	15	11		2	4	6	10	1	2	1
	Prev.	3.3%		3.3%	3.8%	2.8%		5.7%	3.2%	3.2%	5.0%	0.8%	2.7%	2.2%
HINP	Sample	402	273	129	402	0	0	57	60	56	75	61	33	42
	Posit.	74	49	25	74			1	12	12	22	15	8	3
	Prev.	18.4%	17.9%	19.4%	18.4%			1.8%	20.0%	21.4%	29.3%	24.6%	24.2%	7.1%

Posit.: positive

Prev.: prevalence

Table A.3

HIV seroprevalence by age, sex, and location among sentinel groups in Kampong Cham province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	1371	380	991	1371	0	4	156	338	299	214	152	90	64	54
Positive Cases	97	20	77	97	0	0	23	32	14	16	8	2	1	1
Groups														
DCSW	Sample	150	0	150	150	0	0	63	61	18	7	1	0	0
	Posit.	42		42	42			19	17	3	3	0		
	Prev.	28.0%		28.0%	28.0%			30.2%	27.9%	16.7%	42.9%	0.0%		
IDCSW	Sample	100	0	100	100	0	0	16	55	26	3	0	0	0
	Posit.	8		8	8			1	3	2	2			
	Prev.	8.0%		8.0%	8.0%			6.3%	5.5%	7.7%	66.7%			
POL	Sample	150	150	0	150	0	0	8	42	31	31	21	9	8
	Posit.	5	5		5			1	2	1	1	0	0	0
	Prev.	3.3%			3.3%			12.5%	4.8%	3.2%	3.2%	0.0%	0.0%	0.0%
MWRA	Sample	600	0	600	600	0	0	38	139	157	120	82	46	18
	Posit.	18		18	18			2	7	3	3	3	0	0
	Prev.	3.0%		3.0%	3.0%			5.3%	5.0%	1.9%	2.5%	3.7%	0.0%	0.0%
HINP	Sample	371	230	141	371	0	4	31	41	67	53	48	35	38
	Posit.	24	15	9	24		0	0	3	5	7	5	2	1
	Prev.	6.5%	6.5%	6.4%	6.5%		0.0%	0.0%	7.3%	7.5%	13.2%	10.4%	5.7%	2.6%

Posit.: positive

Prev.: prevalence

Table A.4

HIV seroprevalence by age, sex, and location among sentinel groups in Kampong Chhnang province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples	788	150	638	788	0	3	90	169	172	151	102	59	29	13	
Positive Cases	80	3	77	80	0	0	20	33	14	6	4	1	2	0	
Groups															
DCSW	Sample	150	0	150	150	0	3	29	71	32	9	4	2	0	0
	Posit.	59		59	59		0	16	28	9	3	2	1		
	Prev.	39.3%		39.3%	39.3%		0.0%	55.2%	39.4%	28.1%	33.3%	50.0%	50.0%		
IDCSW	Sample	88	0	88	88	0	0	20	36	26	5	1	0	0	0
	Posit.	12		12	12			4	5	3	0	0			
	Prev.	13.6%		13.6%	13.6%			20.0%	13.9%	11.5%	0.0%	0.0%			
POL	Sample	150	150	0	150	0	0	6	13	32	39	32	17	9	2
	Posit.	3	3		3			0	0	1	1	0	0	1	0
	Prev.	2.0%			2.0%			0.0%	0.0%	3.1%	2.6%	0.0%	0.0%	11.1%	
MWRA	Sample	400	0	400	400	0	0	35	49	82	98	65	40	20	11
	Posit.	6		6	6			0	0	1	2	2	0	1	0
	Prev.	1.5%		1.5%	1.5%			0.0%	0.0%	1.2%	2.0%	3.1%	0.0%	5.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.5

HIV seroprevalence by age, sex, and location among sentinel groups in Kampong Speu province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples		694	150	544	694	0	0	59	120	175	131	102	55	45	7
Positive Cases		65	5	64	69	0	0	7	18	23	13	4	0	0	0
Groups															
DCSW	Sample	119	0	119	119	0	0	21	33	39	16	10	0	0	0
	Posit.	56		56	56			7	17	21	9	2			
	Prev.	47.1%		47.1%	47.1%			33.3%	51.5%	53.8%	56.3%	20.0%			
IDCSW	Sample	25	0	25	25	0	0	4	13	6	2	0	0	0	0
	Posit.	2		2	2			0	0	2	0				
	Prev.	8.0%		8.0%	8.0%			0.0%	0.0%	33.3%	0.0%				
POL	Sample	150	150	0	150	0	0	1	8	34	29	35	17	23	3
	Posit.	5	5		5			0	1	0	2	2	0	0	0
	Prev.	3.3%	3.3%		3.3%			0.0%	12.5%	0.0%	6.9%	5.7%	0.0%	0.0%	0.0%
MWRA	Sample	400	0	400	400	0	0	33	66	96	84	57	38	22	4
	Posit.	2		6	6			0	0	0	2	0	0	0	0
	Prev.	0.5%		1.5%	1.5%			0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.6

HIV seroprevalence by age, sex, and location among sentinel groups in Kampong Thom province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples		715	146	569	715	0	0	63	148	191	127	103	49	25	9
Positive Cases		80	6	74	80	0	0	16	26	20	14	2	1	0	1
Groups															
DCSW	Sample	95	0	95	95	0	0	18	30	27	16	2	2	0	0
	Posit.	31		31	31			5	12	11	2	0	1		
	Prev.	32.6%		32.6%	32.6%			27.8%	40.0%	40.7%	12.5%	0.0%	50.0%		
IDCSW	Sample	79	0	79	79	0	0	21	30	18	10	0	0	0	0
	Posit.	27		27	27			10	10	4	3				
	Prev.	34.2%		34.2%	34.2%			47.6%	33.3%	22.2%	30.0%				
POL	Sample	146	146	0	146	0	0	0	6	37	33	36	17	12	5
	Posit.	6	6		6				1	0	2	2	0	0	1
	Prev.	4.1%	4.1%		4.1%				16.7%	0.0%	6.1%	5.6%	0.0%	0.0%	20.0%
MWRA	Sample	395	0	395	395	0	0	24	82	109	68	65	30	13	4
	Posit.	16		16	16			1	3	5	7	0	0	0	0
	Prev.	4.1%		4.1%	4.1%			4.2%	3.7%	4.6%	10.3%	0.0%	0.0%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.7

HIV seroprevalence by age, sex, and location among sentinel groups in Kampot province Cambodia, 1998

Total		Sex		Location		Age group(year)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples	683	147	536	683	0	0	49	121	197	131	100	53	26	6	
Positive Cases	69	8	61	69	0	0	8	27	24	7	1	1	1	0	
Groups															
DCSW	Sample	67	0	67	67	0	0	13	33	16	5	0	0	0	0
	Posit.	41		41	41			8	21	9	3				
	Prev.	61.2%		61.2%	61.2%			61.5%	63.6%	56.3%	60.0%				
IDCSW	Sample	62	0	62	62	0	0	6	19	31	5	1	0	0	0
	Posit.	15		15	15			0	4	10	1	0			
	Prev.	24.2%		24.2%	24.2%			0.0%	21.1%	32.3%	20.0%	0.0%			
POL	Sample	147	147	0	147	0	0	2	1	35	45	23	21	14	6
	Posit.	8	8		8			0	0	4	2	0	1	1	0
	Prev.	5.4%	5.4%		5.4%			0.0%	0.0%	11.4%	4.4%	0.0%	4.8%	7.1%	0.0%
MWRA	Sample	407	0	407	407	0	0	28	68	115	76	76	32	12	0
	Posit.	5		5	5			0	2	1	1	1	0	0	
	Prev.	1.2%		1.2%	1.2%			0.0%	2.9%	0.9%	1.3%	1.3%	0.0%	0.0%	

Posit.: positive

Prev.: prevalence

Table A.8

HIV seroprevalence by age, sex, and location among sentinel groups in Kandal province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	753	150	603	753	0	0	58	169	183	162	113	48	15	5
Positive Cases	59	12	47	59	0	0	9	12	16	13	4	5	0	0
Groups														
DCSW	Sample	103	0	103	103	0	0	17	44	23	11	8	0	0
	Posit.	22		22	22			6	7	3	3	3		
	Prev.	21.4%		21.4%	21.4%			35.3%	15.9%	13.0%	27.3%	37.5%		
IDCSW	Sample	100	0	100	100	0	0	22	49	22	6	1	0	0
	Posit.	9		9	9			1	3	4	1	0		
	Prev.	9.0%		9.0%	9.0%			4.5%	6.1%	18.2%	16.7%	0.0%		
POL	Sample	150	150	0	150	0	0	0	9	25	45	37	22	7
	Posit.	12	12		12				0	2	6	0	4	0
	Prev.	8.0%	8.0%		8.0%				0.0%	8.0%	13.3%	0.0%	18.2%	0.0%
MWRA	Sample	400	0	400	400	0	0	19	67	113	100	67	26	8
	Posit.	16		16	16			2	2	7	3	1	1	0
	Prev.	4.0%		4.0%	4.0%			10.5%	3.0%	6.2%	3.0%	1.5%	3.8%	0.0%

Posit.: positive

Prev.: prevalence

Table A.9**HIV seroprevalence by age, sex, and location among sentinel groups in Koh Kong province Cambodia, 1998**

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	611	151	460	611	0	2	135	172	83	95	69	28	26	1
Positive Cases	122	39	83	122	0	1	42	44	11	15	6	3	0	0
Groups														
DCSW	Sample	134	0	134	134	0	2	92	40	0	0	0	0	0
	Posit.	55		55	55		1	36	18					
	Prev.	41.0%		41.0%	41.0%		50.0%	39.1%	45.0%					
IDCSW	Sample	74	0	74	74	0	0	24	49	1	0	0	0	0
	Posit.	13		13	13			5	8	0				
	Prev.	17.6%		17.6%	17.6%			20.8%	16.3%	0.0%				
POL	Sample	151	151	0	151	0	0	4	50	29	35	29	4	0
	Posit.	39	39		39			0	15	8	10	5	1	
	Prev.	25.8%			25.8%			0.0%	30.0%	27.6%	28.6%	17.2%	25.0%	
MWRA	Sample	252	0	252	252	0	0	15	33	53	60	40	24	26
	Posit.	15		15	15			1	3	3	5	1	2	0
	Prev.	6.0%		6.0%	6.0%			6.7%	9.1%	5.7%	8.3%	2.5%	8.3%	0.0%

Posit.: positive

Prev.: prevalence

Table A.10

HIV seroprevalence by age, sex, and location among sentinel groups in Kratie province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	1103	137	966	703	400	0	53	193	257	208	160	135	86	11
Positive Cases	39	2	37	37	2	0	6	13	11	5	2	2	0	0
Groups														
DCSW	Sample	100	100	100		0	20	38	26	13	2	1	0	0
	Posit.	25	25	25			5	9	8	2	1	0		
	Prev.	25.0%	25.0%	25.0%			25.0%	23.7%	30.8%	15.4%	50.0%	0.0%		
IDCSW	Sample	56	56	56		0	9	25	14	7	1	0	0	0
	Posit.	5	5	5			1	2	1	1				
	Prev.	8.9%	8.9%	8.9%			11.1%	8.0%	7.1%	14.3%				
POL	Sample	137	137	137		0	0	3	34	38	26	24	6	6
	Posit.	2	2	2				0	0	1	0	1	0	0
	Prev.	1.5%		1.5%				0.0%	0.0%	2.6%	0.0%	4.2%	0.0%	
MWRA	Sample	810	810	410	400	0	24	127	183	150	131	110	80	5
	Posit.	7	7	5	2		0	2	2	1	1	1	0	0
	Prev.	0.9%	0.9%	1.2%	0.5%		0.0%	1.6%	1.1%	0.7%	0.8%	0.9%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.11

HIV seroprevalence by age, sex, and location among sentinel groups in Phnom Penh Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	1200	359	841	1200	0	0	101	213	251	229	154	119	62	71
Positive Cases	172	36	136	172	0	0	23	60	38	21	13	9	5	3
Groups														
DCSW	Sample	150	0	150	150	0	0	34	69	35	11	1	0	0
	Posit.	92		92	92			19	47	19	6	1		
	Prev.	61.3%		61.3%	61.3%			55.9%	68.1%	54.3%	54.5%	100.0%		
IDCSW	Sample	100	0	100	100	0	0	16	49	33	2	0	0	0
	Posit.	7		7	7			1	3	3	0			
	Prev.	7.0%		7.0%	7.0%			6.3%	6.1%	9.1%	0.0%			
POL	Sample	150	150	0	150	0	0	1	10	47	51	29	10	2
	Posit.	13	13		13			0	3	5	1	3	1	0
	Prev.	8.7%	8.7%		8.7%			0.0%	30.0%	10.6%	2.0%	10.3%	10.0%	0.0%
MWRA	Sample	400	0	400	400	0	0	8	33	72	88	82	68	31
	Posit.	15		15	15			0	3	0	2	4	2	3
	Prev.	3.8%		3.8%	3.8%			0.0%	9.1%	0.0%	2.3%	4.9%	2.9%	9.7%
HINP	Sample	400	209	191	400	0	0	42	52	64	77	42	41	29
	Posit.	45	23	22	45			3	4	11	12	5	6	2
	Prev.	11.3%	11.0%	11.5%	11.3%			7.1%	7.7%	17.2%	15.6%	11.9%	14.6%	6.9%

Posit.: positive

Prev.: prevalence

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Table A.12

HIV seroprevalence by age, sex, and location among sentinel groups in Prey Veng province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	800	143	657	800	0	0	121	234	169	131	68	59	16	2
Positive Cases	98	8	90	98	0	0	32	32	15	11	5	3	0	0
Groups														
DCSW	Sample	150	0	150	150	0	0	40	64	27	14	5	0	0
	Posit.	44		44	44			17	14	7	3	3		
	Prev.	29.3%		29.3%	29.3%			42.5%	21.9%	25.9%	21.4%	60.0%		
IDCSW	Sample	100	0	100	100	0	0	41	54	5	0	0	0	0
	Posit.	34		34	34			15	17	2				
	Prev.	34.0%		34.0%	34.0%			36.6%	31.5%	40.0%				
POL	Sample	150	143	7	150	0	0	0	25	50	35	20	14	6
	Posit.	9	8	1	9				0	2	4	2	1	0
	Prev.	6.0%	5.6%	14.3%	6.0%				0.0%	4.0%	11.4%	10.0%	7.1%	0.0%
MWRA	Sample	400	0	400	400	0	0	40	91	87	82	43	45	10
	Posit.	11		11	11			0	1	4	4	0	2	0
	Prev.	2.8%		2.8%	2.8%			0.0%	1.1%	4.6%	4.9%	0.0%	4.4%	0.0%

Posit.: positive

Prev.: prevalence

Table A.13

HIV seroprevalence by age, sex, and location among sentinel groups in Pursat province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples	713	153	560	713	0	0	52	130	157	142	100	74	48	10	
Positive Cases	105	6	99	105	0	0	17	44	24	12	4	1	2	1	
Groups															
DCSW	Sample	131	0	131	131	0	0	24	59	34	11	3	0	0	0
	Posit.	84		84	84			14	39	22	8	1			
	Prev.	64.1%		64.1%	64.1%			58.3%	66.1%	64.7%	72.7%	33.3%			
IDCSW	Sample	25	0	25	25	0	0	6	11	5	3	0	0	0	0
	Posit.	7		7	7			2	5	0	0				
	Prev.	28.0%		28.0%	28.0%			33.3%	45.5%	0.0%	0.0%				
POL	Sample	153	153	0	153	0	0	3	7	36	41	32	21	10	3
	Posit.	6	6		6			0	0	1	2	1	0	1	1
	Prev.	3.9%	3.9%		3.9%			0.0%	0.0%	2.8%	4.9%	3.1%	0.0%	10.0%	33.3%
MWRA	Sample	404	0	404	404	0	0	19	53	82	87	65	53	38	7
	Posit.	8		8	8			1	0	1	2	2	1	1	0
	Prev.	2.0%		2.0%	2.0%			5.3%	0.0%	1.2%	2.3%	3.1%	1.9%	2.6%	0.0%

Posit.: positive

Prev.: prevalence

Table A.14

HIV seroprevalence by age, sex, and location among sentinel groups in Rattanak Kiri province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	449	0	449	449	0	0	78	98	101	70	62	24	15	1
Positive Cases	22	0	22	22	0	0	2	7	9	0	4	0	0	0
Groups														
DCSW	Sample	33	0	33	33	0	0	7	18	8	0	0	0	0
	Posit.	7		7	7			1	4	2				
	Prev.	21.2%		21.2%	21.2%			14.3%	22.2%	25.0%				
IDCSW	Sample	30	0	30	30	0	0	3	12	15	0	0	0	0
	Posit.	7		7	7			1	3	3				
	Prev.	23.3%		23.3%	23.3%			33.3%	25.0%	20.0%				
POL	Sample													
	Posit.						NOT AVAILABLE							
	Prev.													
MWRA	Sample	386	0	386	386	0	0	68	68	78	70	62	24	15
	Posit.	8		8	8			0	0	4	0	4	0	0
	Prev.	2.1%		2.1%	2.1%			0.0%	0.0%	5.1%	0.0%	6.5%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.15

HIV seroprevalence by age, sex, and location among sentinel groups in Siem Reap province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	800	149	651	800	0	0	99	194	205	118	89	64	28	3
Positive Cases	106	9	97	106	0	0	19	54	20	7	2	3	1	0
Groups														
DCSW	Sample	150	0	150	150	0	0	52	75	23	0	0	0	0
	Posit.	57		57	57			12	37	8				
	Prev.	38.0%		38.0%	38.0%			23.1%	49.3%	34.8%				
IDCSW	Sample	100	0	100	100	0	0	20	41	32	7	0	0	0
	Posit.	33		33	33			6	14	9	4			
	Prev.	33.0%		33.0%	33.0%			30.0%	34.1%	28.1%	57.1%			
POL	Sample	150	149	1	150	0	0	5	15	35	32	24	26	12
	Posit.	9	9	0	9			0	0	2	1	2	3	1
	Prev.	6.0%	6.0%	0.0%	6.0%			0.0%	0.0%	5.7%	3.1%	8.3%	11.5%	8.3%
MWRA	Sample	400	0	400	400	0	0	22	63	115	79	65	38	16
	Posit.	7		7	7			1	3	1	2	0	0	0
	Prev.	1.8%		1.8%	1.8%			4.5%	4.8%	0.9%	2.5%	0.0%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.16

HIV seroprevalence by age, sex, and location among sentinel groups in Sihanouk ville province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples		803	153	650	803	0	0	91	172	172	165	107	75	20	1
Positive Cases		143	18	125	143	0	0	30	62	22	20	8	1	0	0
Groups															
DCSW	Sample	150	0	150	150	0	0	52	69	22	5	2	0	0	0
	Posit.	86		86	86			24	47	9	5	1			
	Prev.	57.3%		57.3%	57.3%			46.2%	68.1%	40.9%	#####	50.0%			
IDCSW	Sample	100	0	100	100	0	0	22	45	23	10	0	0	0	0
	Posit.	24		24	24			5	12	5	2				
	Prev.	24.0%		24.0%	24.0%			22.7%	26.7%	21.7%	20.0%				
POL	Sample	153	153	0	153	0	0	0	3	32	50	37	25	5	1
	Posit.	18	18		18				0	3	9	5	1	0	0
	Prev.	11.8%	11.8%		11.8%				0.0%	9.4%	18.0%	13.5%	4.0%	0.0%	0.0%
MWRA	Sample	400	0	400	400	0	0	17	55	95	100	68	50	15	0
	Posit.	15		15	15			1	3	5	4	2	0	0	
	Prev.	3.8%		3.8%	3.8%			5.9%	5.5%	5.3%	4.0%	2.9%	0.0%	0.0%	

Posit.: positive

Prev.: prevalence

Table A.17

HIV seroprevalence by age, sex, and location among sentinel groups in Stung Treng province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples		605	125	480	605	0	0	22	92	148	123	98	71	41	10
Positive Cases		21	1	20	21	0	0	5	6	7	2	0	0	1	0
Groups															
DCSW	Sample	51	0	51	51	0	0	9	23	16	3	0	0	0	0
	Posit.	17		17	17			5	6	5	1				
	Prev.	33.3%		33.3%	33.3%			55.6%	26.1%	31.3%	33.3%				
IDCSW	Sample	20	0	20	20	0	0	3	10	7	0	0	0	0	0
	Posit.	2		2	2			0	0	2					
	Prev.	10.0%		10.0%	10.0%			0.0%	0.0%	28.6%					
POL	Sample	129	125	4	129	0	0	1	8	31	35	19	15	13	7
	Posit.	1	1	0	1			0		0	0	0	0	1	0
	Prev.	0.8%	0.8%	0.0%	0.8%			0.0%		0.0%	0.0%	0.0%	0.0%	7.7%	0.0%
MWRA	Sample	405	0	405	405	0	0	9	51	94	85	79	56	28	3
	Posit.	1		1	1			0	0	0	1	0	0	0	0
	Prev.	0.2%		0.2%	0.2%			0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.18

HIV seroprevalence by age, sex, and location among sentinel groups in Svay Rieng province Cambodia, 1998

Total		Sex		Location		Age group(years)								
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50
Samples	707	150	557	707	0	0	89	168	133	151	87	56	18	5
Positive Cases	46	1	45	46	0	0	8	22	6	8	1	1	0	0
Groups														
DCSW	Sample	100	0	100	100	0	32	48	15	5	0	0	0	0
	Posit.	25		25	25		7	12	3	3				
	Prev.	25.0%		25.0%	25.0%		1.0%	25.0%	20.0%	60.0%				
IDCSW	Sample	57	0	57	57	0	8	35	9	5	0	0	0	0
	Posit.	10		10	10		0	7	1	2				
	Prev.	17.5%		17.5%	17.5%		0.0%	20.0%	11.1%	40.0%				
POL	Sample	150	150		150	0	0	1	30	49	35	21	11	3
	Posit.	1	1		1			0	1	0	0	0	0	0
	Prev.	0.7%			0.7%			0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%
MWRA	Sample	400	0	400	400	0	49	84	79	92	52	35	7	2
	Posit.	10		10	10		1	3	1	3	1	1	0	0
	Prev.	2.5%		2.5%	2.5%		2.0%	3.6%	1.3%	3.3%	1.9%	2.9%	0.0%	0.0%

Posit.: positive

Prev.: prevalence

Table A.19

HIV seroprevalence by age, sex, and location among sentinel groups in Takeo province Cambodia, 1998

Total		Sex		Location		Age group(years)									
		Male	Female	Urban	Rural	10- 14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	>50	
Samples		1066	122	2257	1979	400	0	125	202	223	178	129	109	88	12
Positive Cases		74	4	70	57	17	0	19	23	11	14	3	4	0	0
Groups															
DCSW	Sample	99	0	99	99	0	0	40	43	12	4	0	0	0	0
	Posit.	41		41	41			18	15	4	4				
	Prev.	41.4%		41.4%	41.4%			45.0%	34.9%	33.3%	#####				
IDCSW	Sample	45	0	1358	1358	0	0	12	22	11	0	0	0	0	0
	Posit.	3		3	3			0	1	2					
	Prev.	6.7%		0.2%	0.2%			0.0%	4.5%	18.2%					
POL	Sample	122	122		122	0	0	0	1	23	29	22	26	17	4
	Posit.	4	4		4				0	1	1	1	1	0	0
	Prev.	3.3%			3.3%				0.0%	4.3%	3.4%	4.5%	3.8%	0.0%	0.0%
MWRA	Sample	800	0	800	400	400	0	73	136	177	145	107	83	71	8
	Posit.	26		26	9	17		1	7	4	9	2	3	0	0
	Prev.	3.3%		3.3%	2.3%	4.3%		1.4%	5.1%	2.3%	6.2%	1.9%	3.6%	0.0%	0.0%

Posit.: positive

Prev.: prevalence