

## **Current HIV/AIDS/STI Epidemic: Intervention Programs in Cambodia, 1993-2003**

Vonthanak Saphonn, Heng Sopheab, Ly Penh Sun,  
Mean Chhi Vun, Seng Suth Wantha, Pamina M. Gorbach,  
and Roger Detels

In the past decade, Cambodia has been experiencing the most serious HIV/AIDS epidemic in Southeast Asia. With full support from the top policy makers, good leadership in program management, and the commitment of the public health program officers, the HIV/AIDS prevention and care program in Cambodia has been successful, despite its resource constraints. Available data from surveillance and other studies in Cambodia indicate a downward trend in HIV prevalence and incidence among high-risk groups, an increase in condom use among commercial sex workers and their clients, and a declining trend of sexually transmitted infections. Although these findings reflect the success of programs to prevent transmission, the incidence of HIV infections is still high in high-risk populations, and transmission among the general population continues. Cambodia therefore needs to increase its efforts to reduce transmission. More research and prevention programs should focus on the vulnerable populations. HIV/AIDS modeling indicates that Cambodia needs to prepare for increasingly large numbers of AIDS patients who will require expensive medical care.

More than 13 years have passed since the recognition of the first HIV-infected person in Cambodia through serologic screening of blood donors in 1991 (National Center for HIV/AIDS, Dermatology and STDs Control [NCHADS]; Phalla et al., 1998). The HIV/AIDS epidemic has spread to all layers of society in Cambodia, causing it to have the highest national prevalence of HIV in the adult population (15-49 years) in Asia (WHO/UNAIDS, 2002). From early in the HIV epidemic, the Cambodian Ministry of Health made a strong political commitment to the prevention of HIV/AIDS and the care of persons living with HIV/AIDS. A number of relatively successful intervention

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Vonthanak Saphonn, Heng Sopheab, Ly Penh Sun, Mean Chhi Vun, and Seng Suth Wantha are with the National Center for HIV/AIDS, Dermatology and STDs (NCHADS), Ministry of Health, Phnom Penh, Cambodia. Pamina M. Gorbach, and Roger Detels are with the Department of Epidemiology, UCLA School of Public Health, Los Angeles, CA.

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Address correspondence to Roger Detels, Department of Epidemiology, UCLA School of Public Health, Box 951772, Los Angeles, CA 90095-1772; e-mail: detels@ucla.edu

programs have been implemented. In 2002 the Joint United Nations Program on HIV/AIDS (UNAIDS) recognized that Cambodia's epidemic appeared to be stabilizing (WHO/UNAIDS, 2002).

The goal of this article is to describe all the available HIV/AIDS and sexually transmitted infection (STI) epidemiological data in Cambodia, lessons learned from prevention and care programs implemented by the NCHADS in Cambodia, and concerns for future control of the epidemic and care for AIDS patients.

### PAST, CURRENT, AND FUTURE EPIDEMIOLOGICAL SITUATION

Epidemiological data on HIV/AIDS in Cambodia are derived mainly from the HIV/AIDS Surveillance Program. This program has three major data sources: the HIV Sentinel Surveillance Program, the Behavioral Surveillance Survey (BSS) Program, and the Sexually Transmitted Diseases Surveillance (SSS) Program. The HSS was conducted annually to estimate the HIV prevalence in different sentinel groups, and was used to monitor the trend of the epidemic and to provide guidance and evaluation of the intervention program. The BSS was also conducted annually to complement the HSS, because behavioral indicators can be used as one of the early indicators of successful intervention programs. Behavioral data were also used to perform consistency checks with the findings from the HSS. The SSS was also used to monitor the success of the intervention program. STIs provide a useful biological marker of change in sexual behavior, because their relatively short duration reflects more current sexual activity than HIV does. High levels of STIs are therefore a warning system that high levels of sexual mixing are continuing, whereas lower rates of STIs may reflect improvement in the quality of STI care, better provision of services, or changes in risk behavior (UNAIDS and WHO Working Group, 2000).

#### HIV SENTINEL SURVEILLANCE

To date, seven rounds of the HSS have been conducted. Initially, the program selected nine provinces as sentinel sites. Subsequently, the sentinel sites have been expanded from year to year, in an effort to achieve a representative sample for the entire country. The latest HSS results in 2002 showed that the prevalence was highest (28.8%) in brothel-based commercial sex workers (CSWs) and lowest (2.8%) among pregnant women attending antenatal clinics (ANCs). The prevalence among non-brothel-based (indirect) commercial sex workers (IDSWs) was almost half of that in CSWs (14.8%). Police personnel had a prevalence of 3.1% (NCHADS, 2002a). Figure 1 shows the national trends of HIV prevalence for pregnant women and police in urban areas from 1997 to 2002 (only 18 provinces were included for trend analysis), and Figure 2 shows the national trends of HIV prevalence among CSWs and IDSWs in two major age groups (under 20 years and 20 years or older) from 1998 to 2002. These groups are subdivided into two groups, because the under-20 years group provides a rough estimate of incidence. This is because this younger group has had sexual exposure for a limited number of years. The trend among IDSWs was determined only for beer promotion girls, because they are the only subgroup for which data were consistently collected from 1998 to 2002 (NCHADS, 2002a).

There was a downward trend in each of these groups, except for the ANC group, which remained at essentially the same level.

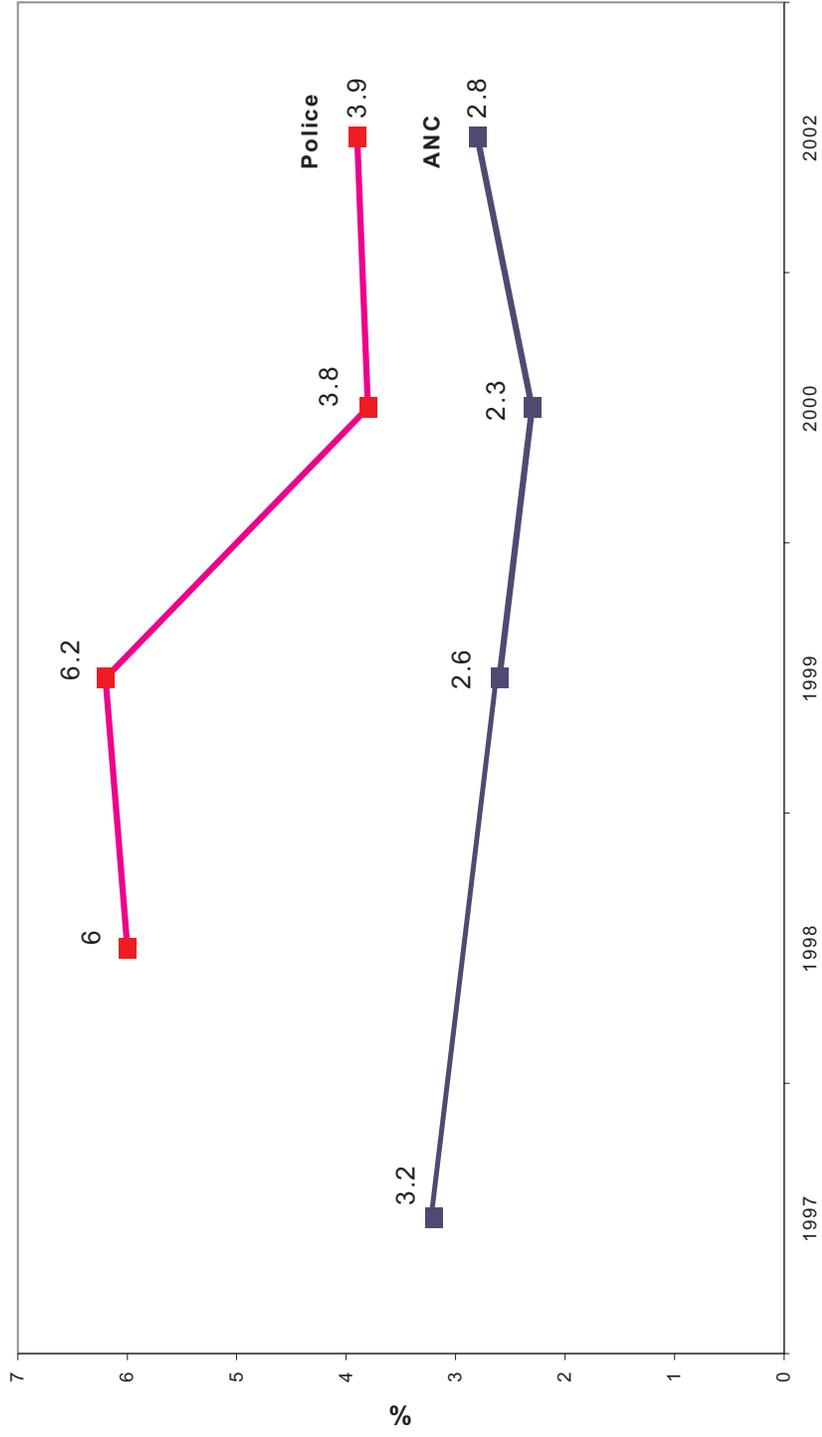


FIGURE 1. The trend of HIV prevalence among antenatal clinic attendees (ANCs) and police personnel in Cambodia, 1997-2002.

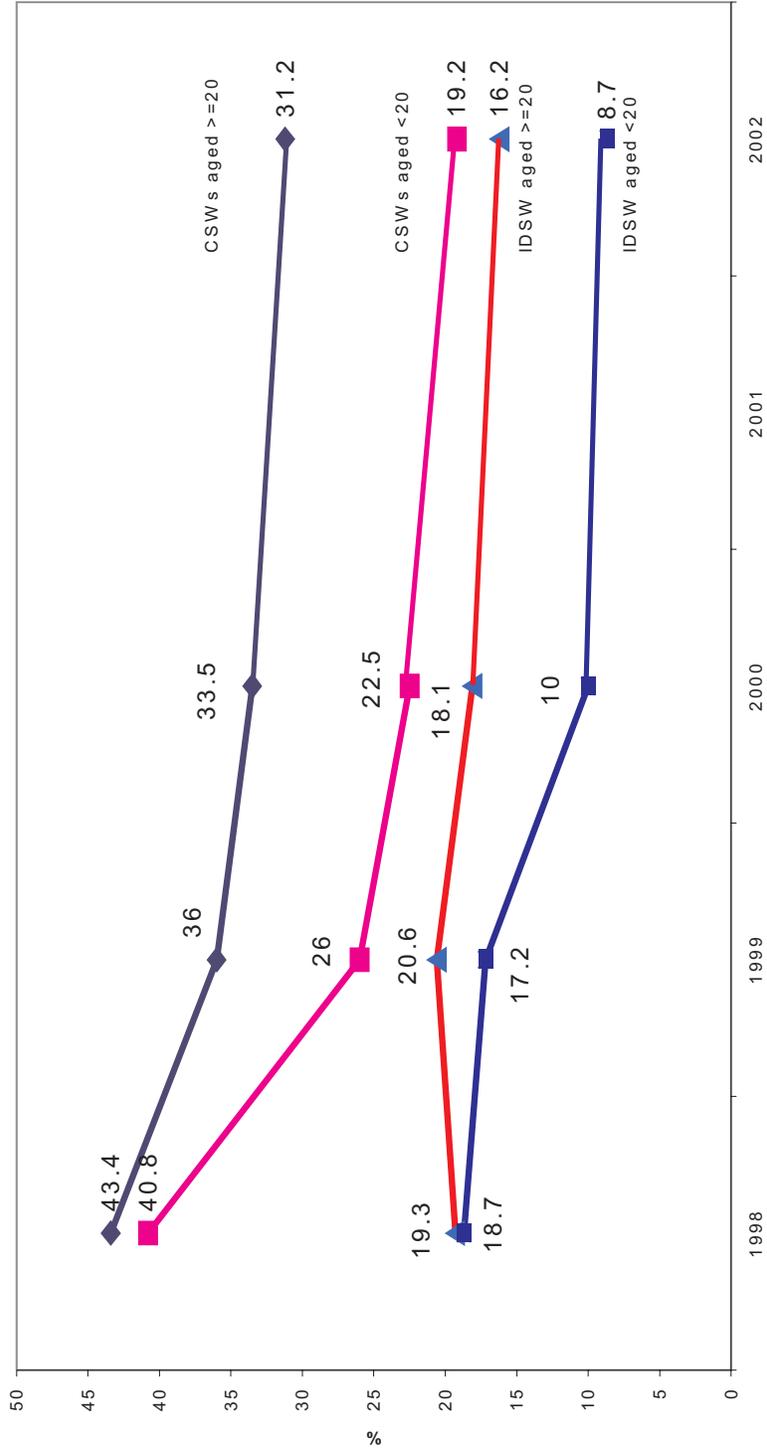
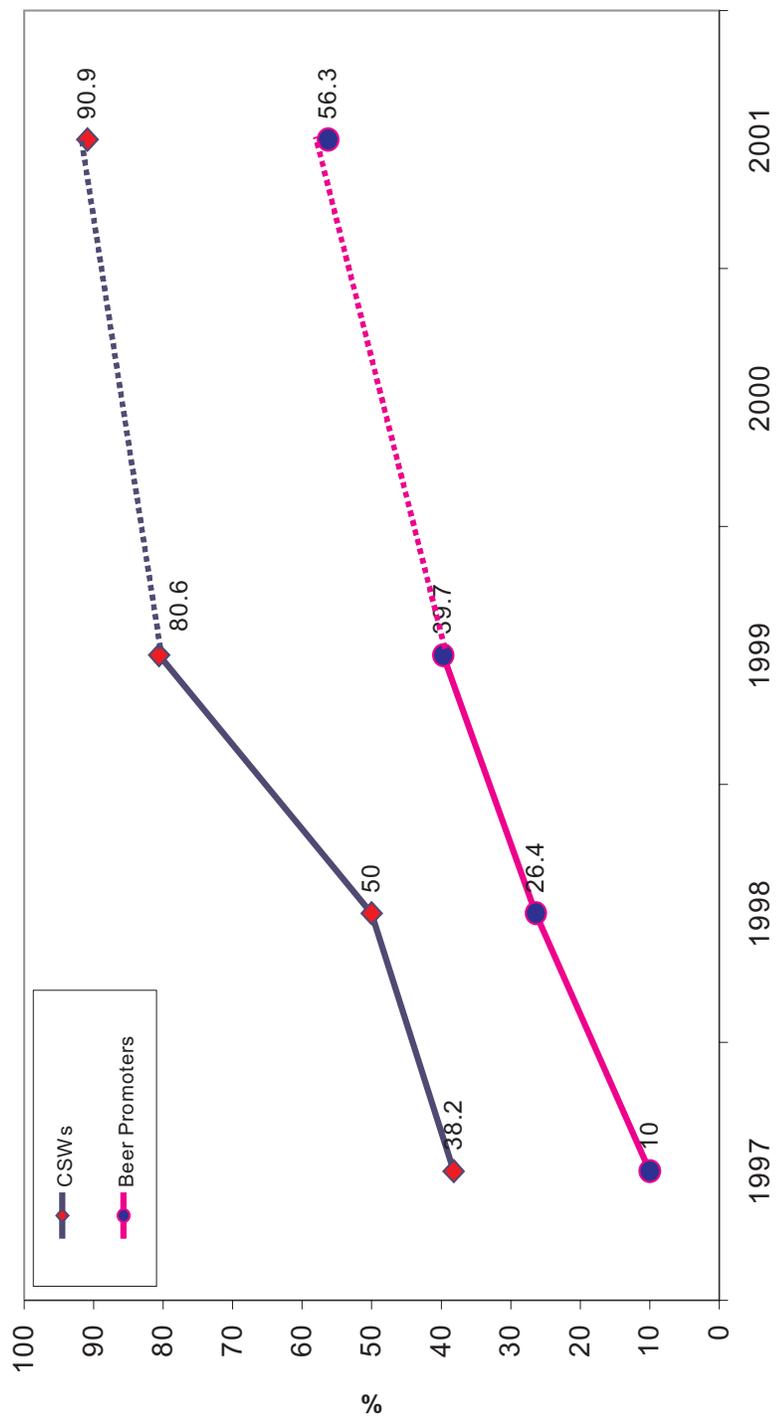


FIGURE 2. The trend of HIV prevalence among commercial sex workers (CSWs) and indirect commercial sex workers (IDSWs) in Cambodia, 1998-2002.



Note: For CSWs, condom use was specified "in past week". For beer promoters, condom use was specified "in 3 months".

FIGURE 3. The trend of consistent condom use among female sex worker groups, 1997-2001.

### BEHAVIORAL SURVEILLANCE SURVEY (BSS)

By 2001 Cambodia had conducted five rounds of BSS in the five major provinces: Phnom Penh, Sihanouk Ville, Battambang, Siem Reap, and Kampong Cham, including a household male survey in 2000. The female risk groups include CSWs and IDSWs (beer promotion workers). Later on, karaoke women were included in the BSS. The male group consists of military personnel, police, and motor-taxi drivers.

Analysis of the trend of sexual risk behaviors in different sentinel groups in the last 5 years provides a good picture of the change in the pattern of risk behaviors in Cambodia. Consistent condom use with different partners and numbers of partners was used as indicator of behavior change, although many other variables are also included in the BSS system. Over the past 5 years, reported consistent condom use has dramatically increased in both CSWs and IDSWs (Figure 3). CSWs reported a 138% increase in consistent condom use between 1997 (38.2%, 103/245) and 2001 (90.9%, 521/565), and IDSWs reported a steady upward trend resulting in a 435% increase between 1997 (10%, 18/122) and 2001 (56%, 90/163) (Gorbach, Sopheab, BunHor, & Saphonn, 2002; NCHADS, 1998a, 1999, 2000a; Sopheab, Phalkun, Leng, Wantha, & Gorbach, 2000). The same pattern of behavior change has also been observed in the military group, motor-taxi drivers, and policemen, although the increase was less in the latter two groups (Figure 4).

Over the past 5 years, there has been a steady downward trend of buying commercial sex services among these men. The BSS indicated a significant decline in buying commercial sex services, from 71.8% of police, 81.6% of military, and 52.4% of motor-taxi drivers in 1997, to 32% of police, 32.9% of military, and 18% of motor-taxi drivers in 2001 (Gorbach et al., 2002; NCHADS, 1998a, 1999; 2000a; Sopheab et al., 2000).

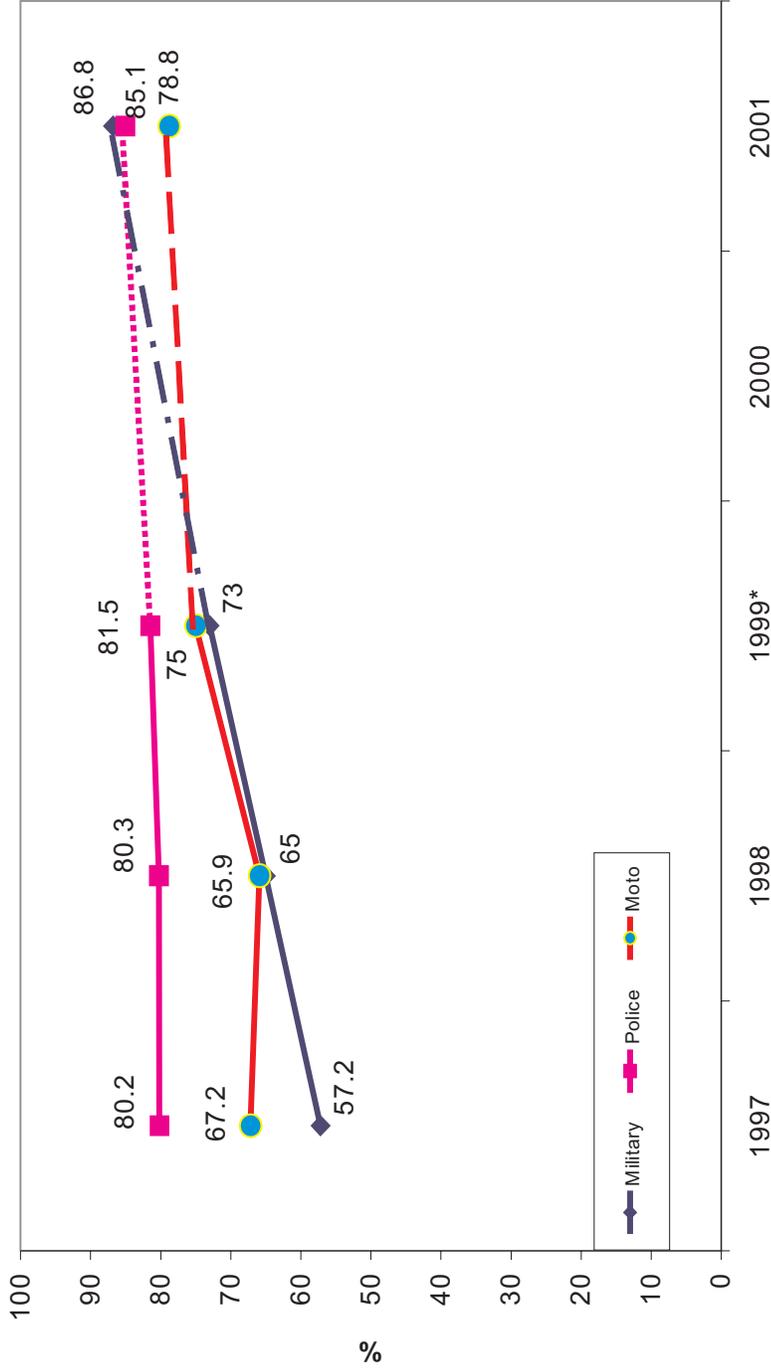
### SEXUALLY TRANSMITTED DISEASES SURVEILLANCE (SSS)

The SSS program has been used to determine STI trends in defined high-risk populations (CSWs, policemen) and low-risk populations (ANC women) and to monitor antimicrobial resistance patterns of *Neisseria gonorrhoea*. The first round of SSS in 1996 was conducted in three provinces: Phnom Penh, Sihanouk Ville, and Battambang. The second round in 2001 covered these three provinces plus an additional four provinces. The available data from the two rounds of STI prevalence in Cambodia show that there was a decline of about 50% in the main curable STIs (syphilis, gonorrhea, and chlamydia) from 1996 to 2001 (NCHADS, 2001a; Ryan & Gorbach, 1996; Ryan et al., 1998). Gonorrhea declined from 26% in 1996 to 14.7% in 2001, chlamydia from 16.7% in 1996 to 8.7% in 2001, and syphilis from 4% in 1996 to 2.7% in 2001. The SSS also showed that close to 50% of all identified gonococcal strains were resistant to ciprofloxacin (46.8% in 1996 and 49% in 2001), but all isolated strains were susceptible to ceftriaxone and spectinomycin. These results provide the basis for appropriate STI program planning and management.

Thus, behavioral and biological data provide convincing evidence confirming the decline in HIV and STI prevalence and suggest that it was due to an increase in protective behaviors and improved STI program management (Gorbach et al., 2002; NCHADS, 2001a; 2002a; Ryan & Gorbach, 1996; Ryan et al., 1998; WHO/UNAIDS, 2002).

### HIV INCIDENCE

The prevalence of HIV infection gives a snapshot of the magnitude of the disease burden for public health. However, HIV incidence, which is the proportion of people



\* In 1999 & 2001 always condom use specified "in last 3 months"

FIGURE 4. The trend of consistent condom use among male groups, 1997-2001.

within a population “at risk” who acquire the disease over a given period of time, is the fundamental marker of the success or failure of programs aimed at preventing transmission. Three explanations were hypothesized to explain this decline in HIV prevalence in Cambodia: (a) as the epidemic progresses, because of the unavailability of treatment, more people are dying from HIV/AIDS than are becoming infected, so the overall number living with HIV is declining; (b) the number of new HIV infections each year has dropped as prevention strategies take effect; and (c) the decline is a result of the combination of the mortality and incidence factors.

Recently, a study to estimate HIV incidence among HIV sentinel surveillance groups was conducted. All positive specimens from the four sentinel groups in the HSS from 1999 to 2002 were tested, using a peptide-based capture enzyme immunoassay (IgG BED-CEIA) to determine the prevalence of recent HIV infections. The study found that, after adjusting for population size and growth rate, the HIV incidence declined from 13.9% in 1999 to 6.45% in 2002 among CSWs, from 5.08% in 1999 to 2.87% in 2002 among IDSWs, and from 1.74% in 1999 to 0.26% in 2002 among police. The HIV incidence among pregnant women did not show a decline; the rate was 0.72% in 1999, 1.11% in 2000, and 0.59% in 2002 (Saphonn, 2003). Although the incidence study showed declining trends of HIV incidence among the high-risk groups, one should be aware that HIV incidence among these groups is still high compared with the high-risk groups in other countries (Harrison et al., 1999; Vanichseni et al., 2001) (Figure 5).

#### HIV SUBTYPE

A study of infected Indonesian peacekeeping personnel stationed in Cambodia as part of the United Nations Temporary Authority in Cambodia in the early 1990s found the type E HIV-1 phenotype, which is similar to the Thai subtype. Other studies have also suggested that the HIV-1 subtype E is the predominant strain in Cambodia (Kusagawa et al., 1999; Lasky et al., 1997; Menu et al., 1999; Ryan et al., 1998; Soeprapto et al., 1995).

#### ESTIMATION AND PROJECTION

Starting in 1999, at the end of each round of HSS, the NCHADS convenes a consensus meeting to which both local and international experts are invited. One of the objectives of the 2002 consensus meeting was to develop a mathematical model to estimate the number of current HIV infections among the general female and male populations in Cambodia. First, an estimation of the annual national prevalence among pregnant women was performed with the Epidemic Projection Package. Second, the national prevalence among pregnant women was adjusted downward to compensate for the overestimation of the national prevalence among the general population of women. Third, the number of HIV infections during that year was estimated to be the product of the total general population of women in that year and the estimated prevalence in this group. The model estimated that in 2002, there were 157,500 people living with HIV/AIDS (PLHA) in Cambodia, an overall prevalence of 2.6% among the general population aged 15-49 years (NCHADS, 2002a).

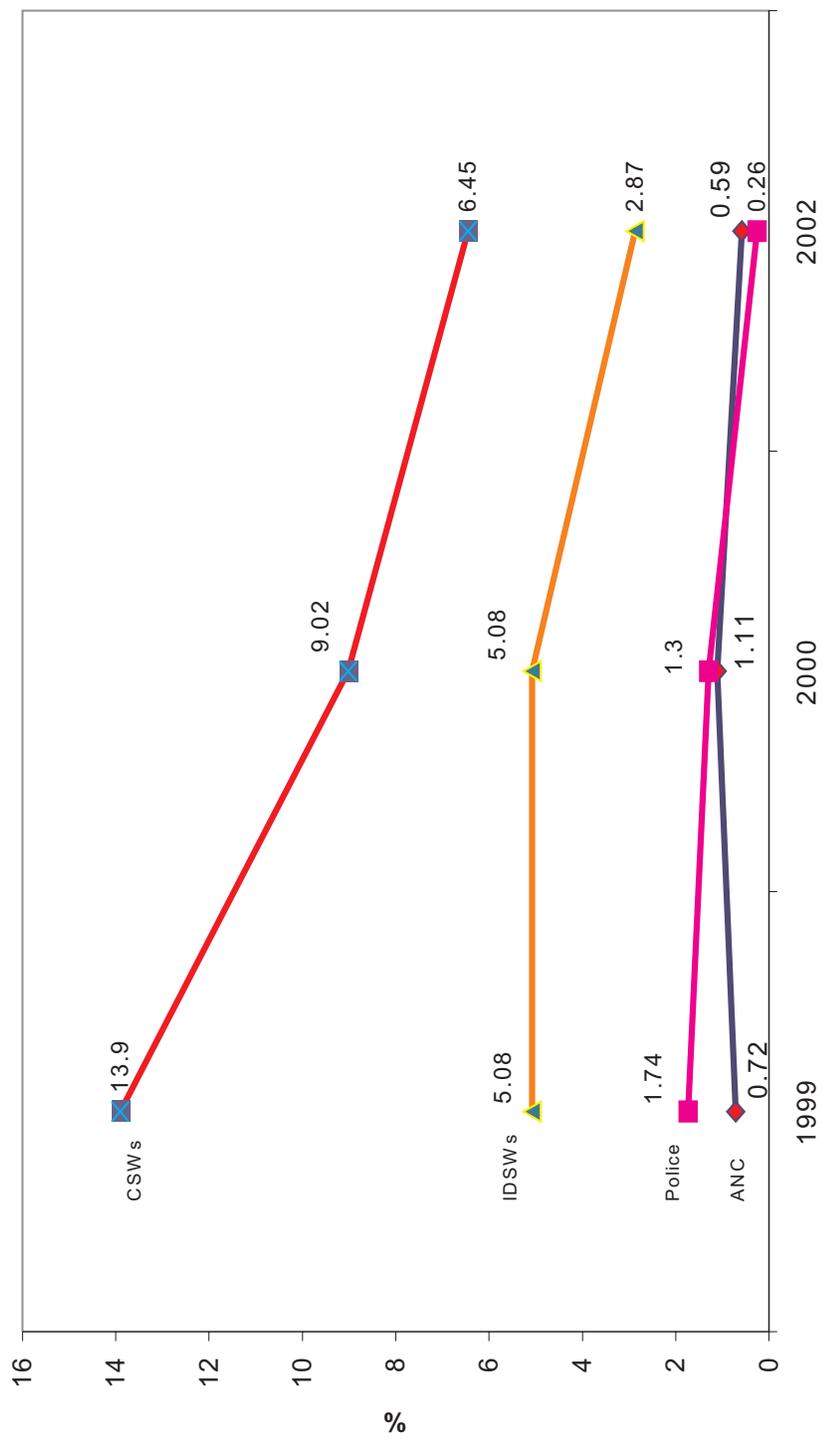


FIGURE 5. The trend of HIV incidence among sentinel surveillance groups, 1999-2002.

## PAST, CURRENT AND FUTURE PLANS FOR HIV/AIDS PREVENTION AND CARE IN CAMBODIA

### ORGANIZATIONAL STRUCTURE AND MANAGEMENT

The Royal Government of Cambodia first established the National AIDS Committee (NAC) in 1993. The NAC originally consisted of the ministers from 12 ministries and the vice governors of provinces, cities, and the Phnom Penh Municipality. The NAC has the responsibility of developing and implementing preventive measures and guiding the Royal Government of Cambodia concerning AIDS issues. A secretariat to the NAC was also established, which consisted of members of the Ministry of Health. The role of the secretariat was to conduct AIDS activities and to cooperate with WHO and other international organizations providing financial and technical support. The secretariat was chaired by the undersecretary of health (NAC, 1993).

Early in the HIV epidemic in Cambodia, the Ministry of Health made a strong political commitment to the prevention of HIV/AIDS and the care of PLHA. The unit within the ministry responsible for implementing the health sector response to HIV/AIDS prevention and care changed names over time. From 1993 to 1997 the unit was called the National AIDS Program. Since 1998, this unit has been called the National Center for HIV/AIDS, Dermatology and STDs, or NCHADS (NAC, 1993).

In 1999 the National AIDS Authority (NAA) was created and was mandated to be responsible for coordination of the government's expanded approach to the epidemic across all sectors. The NAA works with a policy board made up of the secretaries of state from 12 line ministries. A technical board is responsible for overseeing the implementation of HIV programs and policies. At the provincial level, the NAA supports provincial AIDS committees, which serve as policy-setting groups and are chaired by the provincial governors (NCHADS, 2000b).

### NATIONAL HIV/AIDS AND STI STRATEGIC PLANNING

Since the establishment of the National AIDS Program in 1993 and its upgrade as the NCHADS in 1998, the center has developed three consecutive HIV/AIDS national strategic plans: 1993-1998 Comprehensive National Plan for AIDS Prevention and Control in Cambodia (NCHADS, 1993); 1998-2000 National Strategic Plan for STD/HIV/AIDS Prevention and Care in Cambodia (NCHADS, 1998b); and 2001-2005 Strategic Plan for HIV/AIDS and STI Prevention and Care in Cambodia (NCHADS, 2000b). Each subsequent plan reflected the changing focus of interventions over time, according to the stage of the HIV epidemic in Cambodia. For example, the first strategic plan (1993-1998) emphasized prevention measures such as health education for the high-risk and general populations, condom promotion, prevention of transmission through blood transfusion, and surveillance. A major emphasis was to convince people to recognize the epidemic and to increase their awareness of the need to implement prevention measures. The second strategic plan (1998-2000) added voluntary testing and counseling, and the third strategic plan (2001-2005) added care of PLHA.

The 2003-2007 Ministry of Health Sector Strategic Plan emphasizes a commitment to prevention of HIV/AIDS, care for PLHA, and assistance to affected family members. The plan responds to three basic needs to: (a) reduce transmission in high-risk groups through targeted STI treatment and increased condom use, (b) increase awareness of HIV in order to promote HIV counseling and testing services to both the high-risk and general populations, and (c) equip the health system to respond to the increased demand for prevention and care services (Ministry of Health, 2003). These three components are divided in eight areas: (a) HIV/AIDS and STI informa-

tion, education, and communication targeting the general population, as well high-risk populations, using targeted behavior change communication strategies; (b) the 100% Condom Use Program (CUP) for brothel-based sex; (c) STI services for populations most at risk, as well as for the general population; (d) blood safety; (e) prevention of mother-to-child transmission; (f) the continuum of care, including institutional, home, and community-based care, voluntary confidential counseling and testing, and use of universal precautions for health care workers; (g) HIV/AIDS surveillance and research; and (h) organizational and program management, planning, and coordination (Ministry of Health, 2003).

### MAJOR LESSON LEARNED

*100% Condom Use Program.* The 100% CUP, based on the model successfully implemented in Thailand, was piloted in Cambodia in 1998. Since then, this program has been expanded nationwide (to 22 of 24 provinces), requiring consistent condom use with all clients at brothels and for all types of commercial sex. The key elements of the Cambodia 100% CUP include involvement and commitment by a wide range of stakeholders (policymakers, local government officials, owners of sex establishments, NGOs, an outreach program, peer education, regular mapping of sex establishments, regular examinations and free STI care and treatment for sex workers, ensuring availability and accessibility of condoms, and monitoring condom use. Reliable data from Thailand and Cambodia demonstrate a decline of STIs and HIV prevalence among sex workers after implementation of these programs (Rojanapithayakorn, 1996; World Health Organization/Western Pacific Region, 2001; Regional Office for the Western Pacific & NCHADS, 2001). Since launching the 100% CUP in 1998 in Cambodia, the incidence of syphilis has declined from 9% in 1998 to 1.8% in 2000 among sex workers in Sihanouk Ville (one of the first 100% CUP pilot sites in Cambodia) and trichomoniasis from 2% to 0.9%, concurrent with an increase in condom use to 96%. However, one of the limitations of the 100% CUP is the lower coverage of the indirect sex workers, a large group of women who have not been subject to the regulatory aspect of the program. This issue has been raised in many reports (Lowe, 2003; O'Reilly et al., 2003; NCHADS, 2003). According to the NCHADS outreach program, 50% of the estimated 20,000 sex workers in Cambodia are indirect sex workers (NCHADS, 2002b). More innovative strategies need to be implemented to reach this group.

*Surveillance Program.* Cambodia is among the few developing countries that has an effective surveillance system, including HSS, BSS, and SSS (Walker et al., 2000). Data from biological and behavioral surveillance have been very useful for program monitoring, planning, and intervention. Data from the HSS and BSS have been used to monitor and evaluate the intervention programs (health education program to high-risk populations, STI services, 100% CUP) that NCHADS and other organizations have implemented. Using predictions based on HSS and BSS data, NCHADS has been able to plan for the expected increasing burden of HIV/AIDS in coming years. The surveillance program conducted by NCHADS has played a very important role in resource mobilization by the Cambodian government, donors, multilateral agencies, and NGOs. During the last 5 years, the funding commitment from the government and bilateral or multilateral donors has been increasing remarkably (Mean & Godwin, 2002).

*HIV/AIDS Care.* As indicated in the third version of the Cambodia National Strategies Plan (2001-2005) and the Midterm Assessment of this National Strategies

Plan in July 2003, care for PLHA has become a priority. Although the country has experienced a decline in both prevalence and incidence among high-risk populations, increasing numbers of adults and children have developed HIV symptoms, which increases the burden upon the already overtaxed existing health care system. According to the NCHADS estimate, there were about 19,000 new AIDS cases and 18,000 new AIDS deaths in the year 2002. The continuum of care, including voluntary confidential counseling and testing, prevention of mother-to-child transmission, institutional care (opportunistic infections, tuberculosis, and antiretroviral drugs), and home-based and community care, has been established and expanded. The number of counseling-and-testing sites has increased from 5 in 1997 to about 50 by the end of 2003. Treatment of HIV-infected pregnant women with nevirapine at the time of delivery was implemented in 1999 in Phnom Penh, the capital, and has now expanded to five provinces. Home-based care was first introduced in Cambodia in 1997, initiated by WHO in Phnom Penh. It has now been increased to 52 home-based care teams in 10 provinces and cities supported by both the government and NGOs. Home-based care was developed to provide HIV/AIDS care services, which reduces the burden on public health care facilities and provides a broad package of medical, psychological, and social support services to PLHA and their families. As of November 2003, 2148 PLHA had received antiretroviral drugs. By the end of 2004, the NCHAD plans to provide antiretroviral treatment to 5,000 people (NCHADS, 2004).

## CONCLUSIONS

Thanks to the commitment of the top policymakers, the endless efforts of government institutions, communities, PLHA, and NGOs, the HIV/AIDS epidemic in Cambodia has remained at a stable level. Although there has been a decreasing trend of HIV prevalence and incidence among high-risk populations and an increasing trend in protective risk behavior, Cambodia still has the highest HIV prevalence among the general population aged 15-19 years in Southeast Asia. Moreover, the rate of new HIV infections is still high in the high-risk populations, and transmission among the general population continues. Cambodia therefore needs to increase its efforts to reduce new transmission. In addition to research and intervention to reduce transmission among high-risk populations, more research and prevention programs should focus on vulnerable populations, such as wives and girlfriends, and hard-to-reach populations, such as indirect sex workers.

At the same time, Cambodia must prepare its health infrastructures and human resources to cope with the expected increasingly large number of AIDS patients. The availability of antiretroviral drugs will escalate medical care costs and require the development of a treatment infrastructure and training of health workers in clinical management of patients.

To cope with these dramatic changes resulting from the HIV/AIDS epidemic, the government of Cambodia must develop and implement strategies that are cost effective and feasible for a developing country, and that are flexible enough to anticipate and respond to unexpected changes in the epidemic. Achieving this will require the collaboration of national and international institutions.

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