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# An annual update on the HIV epidemic in Viet Nam

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## List of abbreviations

AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal care
ART	Antiretroviral therapy
ARV	Antiretroviral
BCC	Behavior change communication
CBO	Community-based organization
CUP	Condom use program
FSW	Female sex worker
HCMC	Ho Chi Minh City
HIV	Human immunodeficiency virus
HSS	HIV Sentinel Surveillance
HTC	HIV testing and counseling
IBBS	Integrated Biological and Behavioral Survey
IEC	Information, education and communication
INGO	International non-governmental organization
KAPs	Key at risk populations
LGBT	Lesbian, gay, bisexual and transgender
MARPs	Most at risk populations
M&E	Monitoring and evaluation
MMT	Methadone maintenance therapy
MOH	Ministry of Health
MOLISA	Ministry of Labor, War Invalids and Social Affairs
MOPS	Ministry of Public Security
MSM	Men who have sex with men

NGO	Non-governmental organization
NIHE	National Institute of Hygiene and Epidemiology
PAC	Provincial AIDS Centre
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission
PWID	Person/people who inject(s) drugs
STD	Sexually transmitted disease
STI	Sexually transmitted infection
UNGASS	United Nations General Assembly Special Session on HIV and AIDS
VAAC	Viet Nam Administration of AIDS Control
VCT	Voluntary counseling and testing
WB	The World Bank
WHO	World Health Organization

## Executive summary

HIV epidemic in Viet Nam is still in HIV concentrated epidemic: High HIV prevalence among people who inject drugs (PWID), female sex workers (FSW), and men who have sex with men (MSM) and low HIV prevalence among pregnant women and military recruits. HIV prevalence tends to decrease in high risk populations and low risk populations. Prevention and intervention programs effectively reduce HIV prevalence and risk behavior and increase preventive behavior among populations.

There are some particular patterns in HIV epidemic by geographic area. HIV epidemic in North-West is mostly among PWID. HIV epidemic in South-West is mostly heterosexual. HIV transmission risks among PWID are sharing of needles and syringes and non-consistent condom use with FSWs. Injecting drug FSWs is much higher risk for HIV transmission than non-drug injecting FSWs. Unsafe drug injection and selling sex are drivers for HIV epidemic among MSM.

Strengthening HIV sexually transmission prevention from high risk populations such as FSWs, IDUs and men with multiple sex partners to their primary sex partners. Coverage of HIV counseling and testing among most at risk populations (MARPs) and their sex partners need to be strengthened.

HIV/AIDS programs need to pay attention on expanding coverage, strengthening quality, and promoting HIV prevention services. Integration of prevention programs for MARPs including syringe and needle, condom distribution, Methadone maintenance treatment program, routine HIV testing and early treatment must be prioritized in the response to the epidemic among MARPs.

Care and treatment need to be improved by encouraging HIV early diagnosis, reference to care and treatment services, paying attention to HIV/TB diagnosis and treatment, mobilizing support from family, community to PLHIV, strengthening responsibility of PLHIV to their family, society, particularly in HIV prevention programs and participating in HIV/AIDS prevention and control activities.

## I. Brief history of the HIV epidemic evolution

The first HIV infected case was reported in Viet Nam in December 1990. During 1991-1992 and the first half of 1993, only 11 additional cases were reported. However, in the second half of 1993 >1,100 HIV infected cases were reported in some provinces in the Southern Region and the Southern part of the Central Region. Most of these HIV cases were among people who inject drugs (PWID) who had been injecting drugs for many years. From 1994 to the first half of 1997, the number of HIV reported cases increased relatively slowly. Although the majority of HIV cases were PWID (from nearly 90% in 1993 to over 60% in 1997), HIV transmission spread to other risk groups, such as female sex workers (FSW) and sexually transmitted infections (STIs) individuals. Since the second half of 1997, i.e. when epidemics in the South and Central regions were developing, a new HIV epidemic among PWID was documented in many Northern provinces. By 1998, HIV had been reported in all 61 provinces and cities. By the end of 2013, there were 217,008 reported HIV cases across the country, of whom 66,755 were AIDS patients and 69,062 were AIDS-related deaths. HIV cases have been reported in 98% of districts and 78% wards/communes. The Ministry of Health (MOH) has projected there will be 263,317 PLHIV cases by 2015.

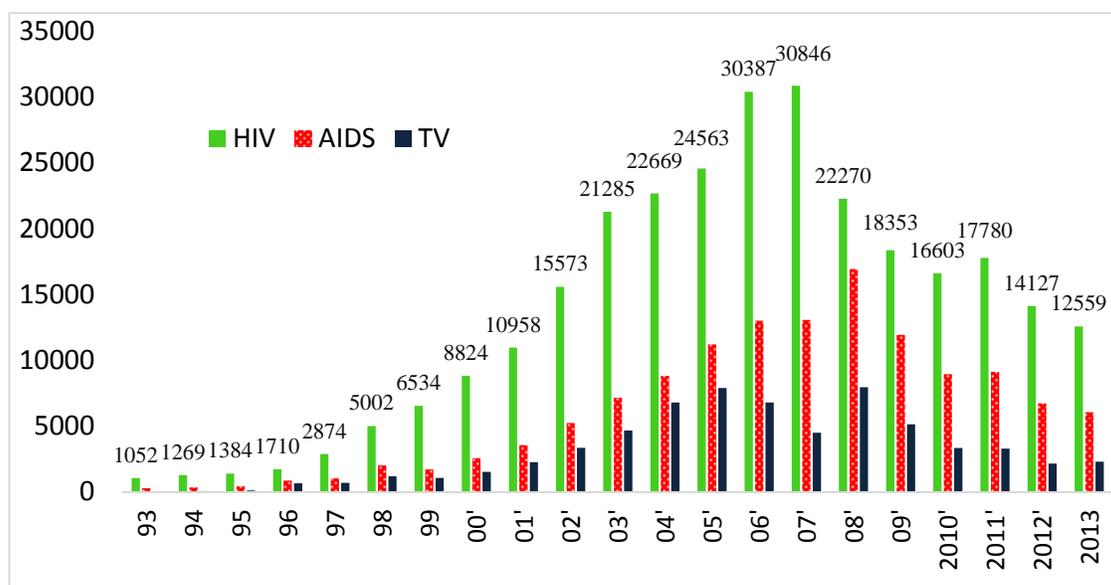


Figure 1: The number of HIV/AIDS and Dead newly reported cases by years

There are indications that HIV prevalence in Viet Nam may have begun to stabilize over the last several years. The number of HIV cases newly reported decreased rapidly between 2007 and 2009 and held steady at about 14,000 reports per year from 2010 to 2013. AIDS case

reports and related mortality have also remained fairly steady since 2009 (Figure 1). HIV/AIDS case reporting trends were consistent with declining HIV prevalence among key populations at highest risk of transmission described below sections.

HIV epidemics in Viet Nam are concentrated among PWID, MSM, and FSWs, who have a very high HIV prevalence, but with wide geographical variation. The data indicates that HIV prevalence is very low in the general population. The HIV prevalence among military conscripts and ANC attendees in HIV sentinel surveillance (HSS) was at a very low level and has been stable for years. There have been very few provinces in which HIV prevalence exceeded 1% among military conscripts and ANC attendees at some points. HIV prevalence in the general population in very few population-based surveys data was very low, e.g. 0.3% in a rural province and 0.7% in a city.

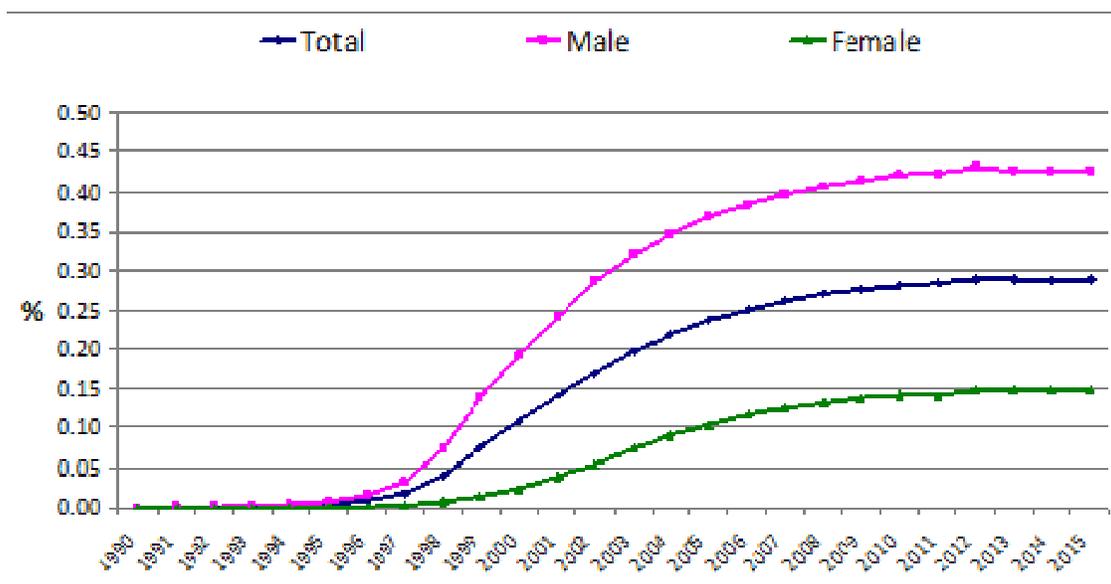


Figure 2: Overall HIV prevalence among general population by gender

Geographical differences are clearly documented. The Northwest region, Thai Nguyen, Ha Noi, Quang Ninh, Hai Phong, HCMC, Can Tho and An Giang have the highest HIV prevalence in the country. The underlying causes of the high prevalence rates in these provinces is the high HIV prevalence among PWID and FSWs in the northern provinces such as Dien Bien, Son La, Thai Nguyen, Quang Ninh, Hai Phong and Ha Noi and in the southern provinces such as An Giang, Can Tho and HCMC. Data on HIV/AIDS case reporting by geographical areas shows that HIV cases are concentrated in the Northern, Mekong River Delta and South East

provinces. Provinces with a high number of HIV infections are North West mountainous provinces and mountainous districts of Nghe An and Thanh Hoa. The HIV epidemic in the two largest cities of Hanoi and Ho Chi Minh City has become complicated and difficult to control. According to HSS data, in 2013, the HIV prevalence among PWID, MSM and FSWs were 10.3%, 2.6% and 3.3%, respectively. The distribution of HIV cases largely follows the distributions of these three population groups, which are heavily concentrated in urban centers and also exist in non-urban communities.

Overall, Viet Nam has maintained HIV prevalence among general population below 0.3%, which is lower than the target set by the previous national strategy for 2004–2010. The medium estimates and projections scenario shows that HIV prevalence in both adult and children will remain below 0.3% by 2015 (Figure 2).

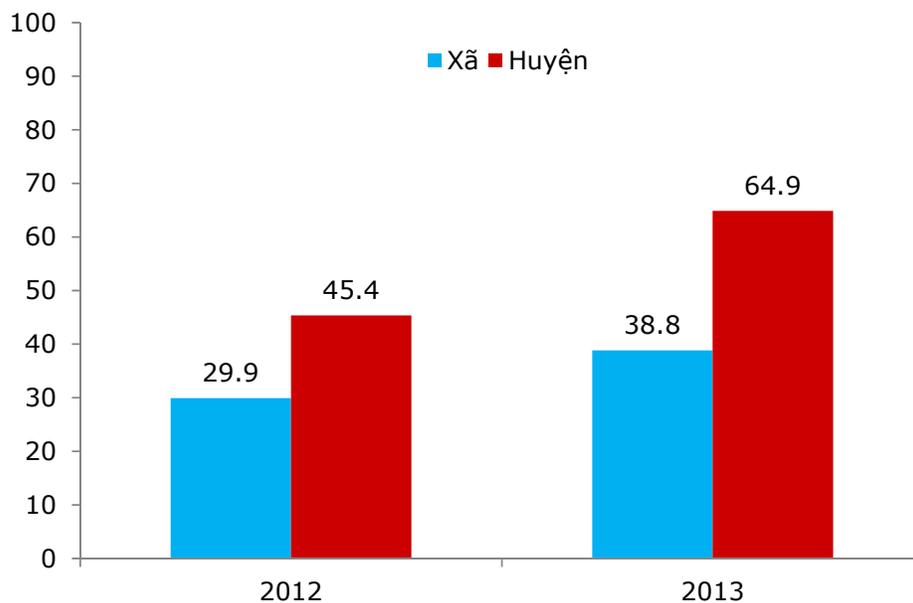


Figure 3: Needle and syringe program

The harm-reduction program focuses on providing information, drug abuse treatment, condoms and needles/syringes, and referral to HIV voluntary, counseling and testing (VCT) services targeting PWID, FSWs, MSMs, and the mobile population. The government has been committed to making harm-reduction intervention widely available. The coverage of the program has increased; however, it still remains at a low level. The program has contributed significantly on the reduction of HIV prevalence among PWID, FSWs and eventually resulting in reduction of HIV reported cases overall.

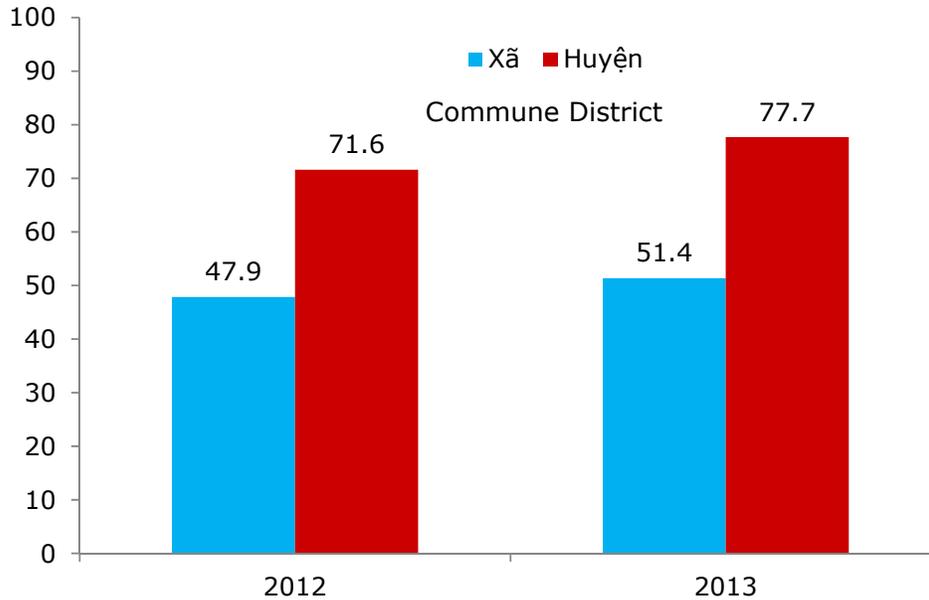


Figure 4: Condom distribution program coverage

The National Action Plan on HIV/AIDS Care and Treatment was approved in 2006. The plan states that 70% of eligible adults and 100% of eligible children will receive ARV by the year 2015. The annual domestic budget for ARV has been increased substantially, from 1 billion VND (~\$65,000) in the late 1990s, to 10 billion VND in 2005, and to 54 billion VND in 2013, from 1 billion VND (~\$65,000) in the late 1990s, to 10 billion VND in 2005, and to 54 billion VND in 2013. Despite this significant increase, international donors remain the main source funding of the treatment. PEPFAR supports the highest number of people on ARV treatment, followed by the Global Fund. Other significant providers are the French government's ESTHER Project and the Clinton Foundation HIV/AIDS Initiative (CHAI). During the development of this thesis, there has been a remarkable expansion in provision of ARV, care and support services for PLHIV in Viet Nam. By the end of 2013, 79,819 patients were receiving ARV in Viet Nam. In 2012, ARV coverage was 59% in adults and 86% in children. The number of PLHIV who receive care and treatment in general has also increased from 10,043 in 2008 to 79,846 in 2013. This program has contributed significantly to the reduction of dead cases due to AIDS in the last 5 years (Figure 5).

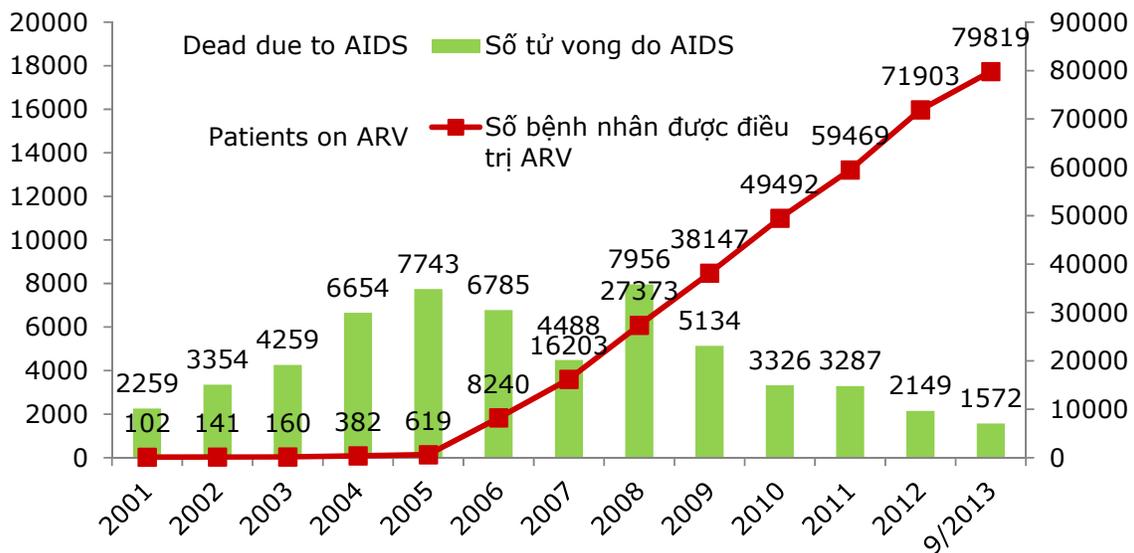


Figure 5: Number of patients on ARV and number of dead due to AIDS by years.

## II. Sexual transmission are dominant among HIV newly reported cases recently

Male continued to account for the majority of people living with HIV and new HIV reported cases. Male accounted for 80% and women 20% of all HIV reported cases. Before 2006, men was accounted for 85% among HIV cases, but since 2007 the number of female infected with HIV accounted for 29% on average of all HIV recorded cases. The proportion of female HIV cases among all cases reported has been steadily increasing. Intimate partner transmission from high-risk men to their spouses or regular sexual partners contributes to approximately half of the newly reported HIV cases among women.

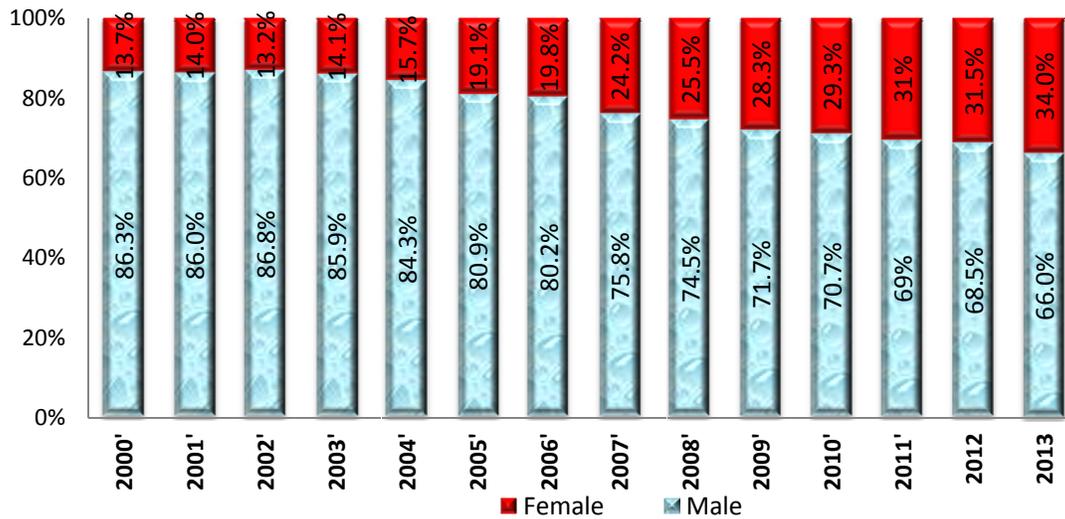


Figure 6: Distribution of HIV newly reported case by gender by years

The main HIV transmission route in Viet Nam is drugs injection, (sharing syringes and needles with injecting partners), accounting for 70% of all HIV reported cases. However in the past 10 years HIV infections due to sexual transmission have increased from approximately 13% in 2004 to 45% in 2013.

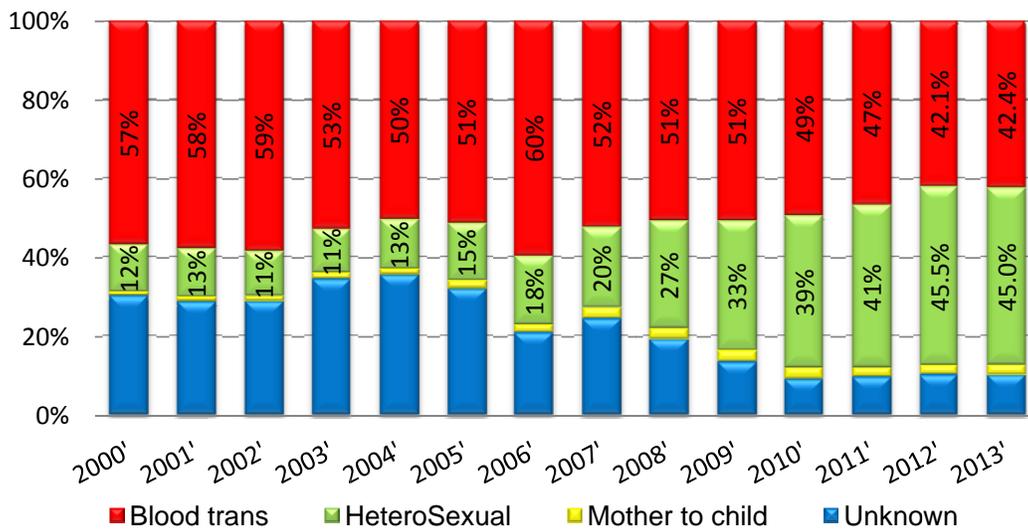


Figure 7: Distribution of HIV newly reported cases by route of transmission by years

In addition, there has been a significant difference in HIV transmission pattern among localities. The main HIV transmission route in the majority of cities and provinces is through drugs injection, while in the southern part of the country, especially in the Mekong River Delta provinces the epidemic grows mainly through sexual transmission, and recently the

number of sexually transmitted cases has increased rapidly. In the Northern provinces and northeast coast, drugs injection is still the major HIV transmission mode, but in recent years sexually transmitted HIV cases are showing signs of increasing. The central coastal provinces and central highlands with HIV prevalence rates, the transmission pattern here combines both sexual contact and drugs injection.

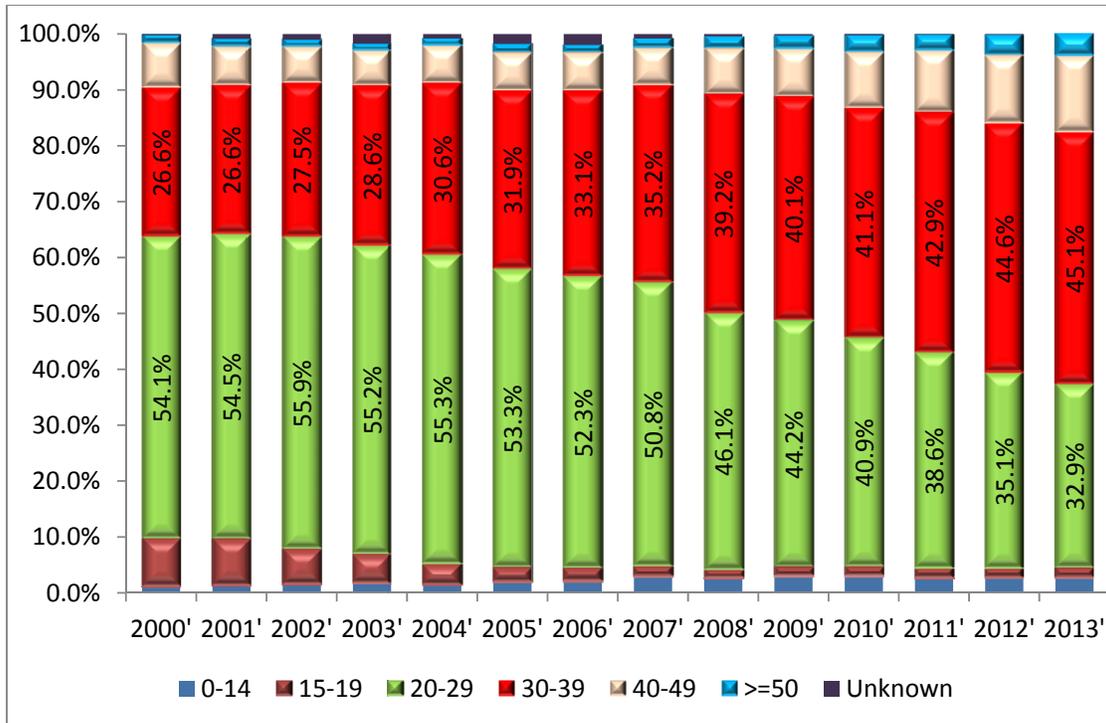


Figure 8: Distribution of HIV newly reported case by age groups by years

The majority of PLHIV reported in 2013 are between the ages of 20-39, with this age demographic accounting for 79%. The distribution of HIV cases by age groups has also changed through the years. In the early years of the epidemic, the majority of people living with HIV/AIDS were in the age group 30-39 years, but after 1998 people infected with HIV were getting younger. However, the proportion of people living with HIV/AIDS aged 30-39 years was starting to increase recently.

### III. HIV epidemic among people who inject drugs: Decreasing or stabilizing at high level

PWID are the predominant group of HIV-positive people in Viet Nam. According to HSS data, HIV prevalence among PWID peaked around 2001-2004 and decreased steadily from 2004 to 2013. Although HIV prevalence among PWID has decreased overall, it has remained at high level in many provinces.

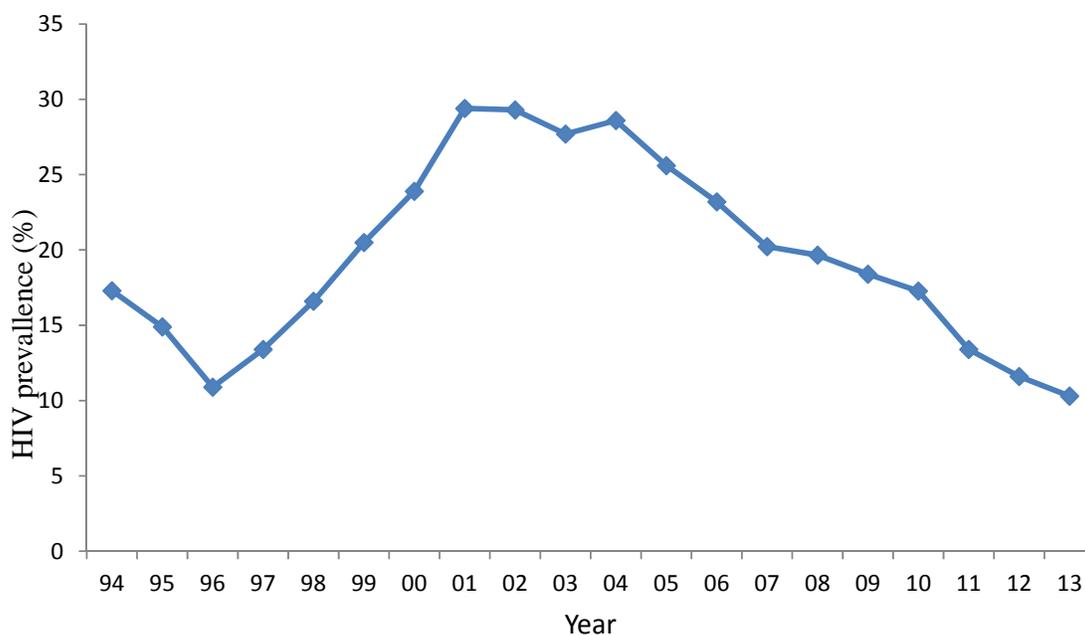


Figure 9: HIV prevalence among PWID as measured by the national HIV surveillance system.

Result of HSS+ and IBBS show that the HIV prevalence among PWID was very high in Hanoi and Ho Chi Minh City. The trend over time was quite similar between IBBS and HSS+. In Ha Noi, HCMC, and An Giang where both HSS and IBBS conducted HIV prevalence among PWID decreased or stabilized recently. However, HIV prevalence among PWID was quite different between two data sources. In Ho Chi Minh City, result of IBBS was nearly 10% higher than HSS+ (37.4% - IBBS 2013 compare to 29.3% - HSS+ 2012). This might be due to differences in geographic areas and methodology.

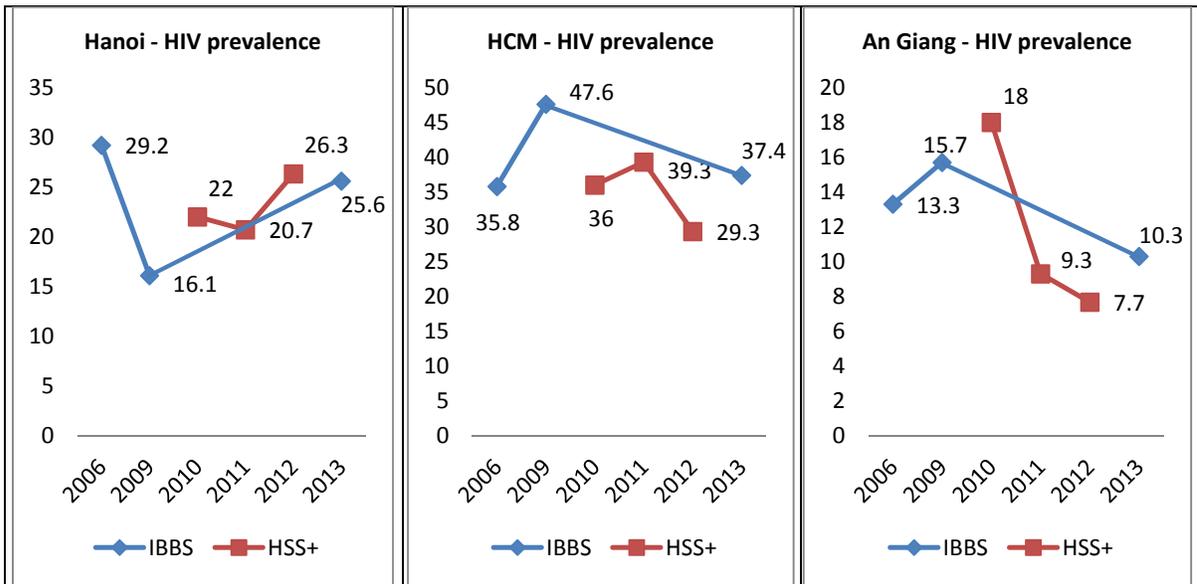


Figure 10: Trend of HIV prevalence among PWID over time

HIV/AIDS estimates and projections show that HIV prevalence among PWID from now to 2015 will decrease or stabilize in most provinces and areas. It is projected to slightly decrease from 26% in 2011 to 23% in 2015. At the regional level, however, the epidemic trends are quite diverse. Some cities and provinces show signs of decreasing trend in HIV prevalence, yet remain at high levels in 2015 (Hai Phong 43%, Quang Ninh 40%) while stabilized trends are observed in some others like North West (39%), Nghe An (27%). HIV prevalence is still expected to stay at very high level of 48% in HCMC in 2015. The diversity of HIV situation among PWID populations across the country suggests that prevention programs should not be scaled back. In contrast, on-going transmission needs to be stopped by effective prevention measures. In addition, the rapidly rising prevalence among PWID in the North West region in recent years (i.e. more recent epidemics) calls for intensified intervention to prevent HIV prevalence reaching the same level as in urban centers and older epidemics.

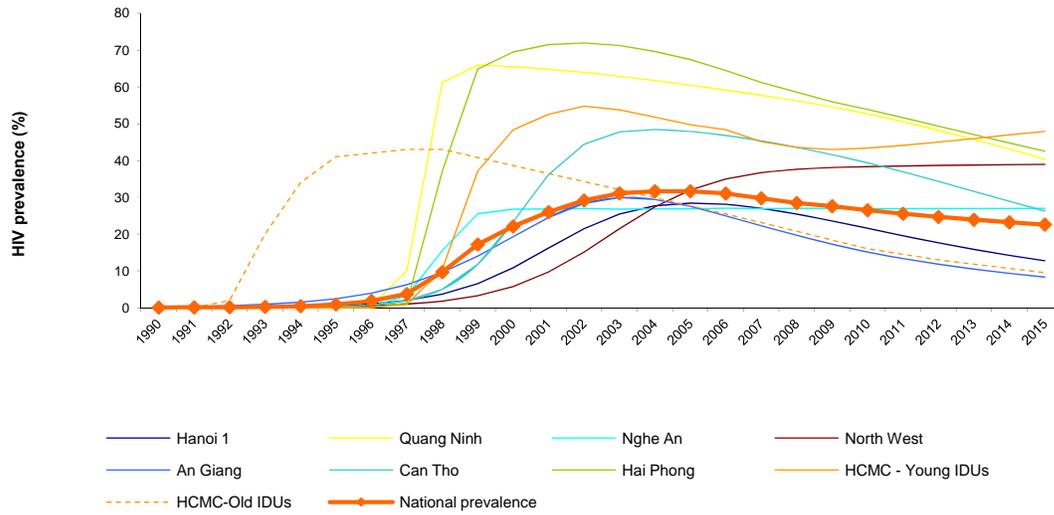


Figure 11: HIV prevalence among PWID by region

Prevalence of syphilis among PWID also decreased and stabilized in the past several years. This suggests that sexual risk behavior also decreased resulting from effectiveness of the condom use program among this key population (Figure 12).

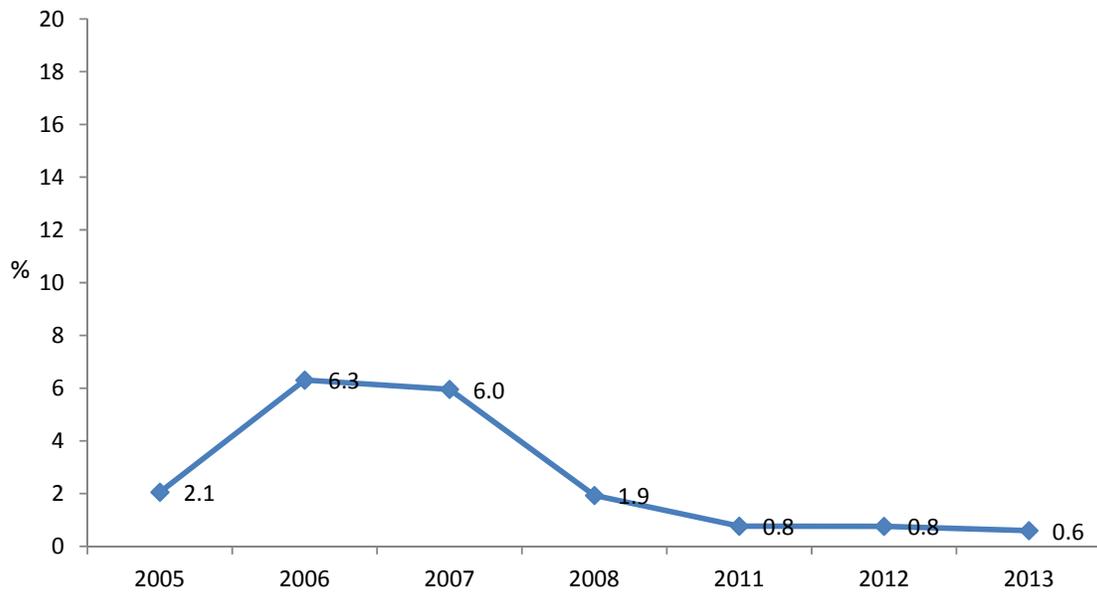


Figure 12: Prevalence of syphilis among PWID

The trend over time of sharing needles and syringes in the last 6 months has decreased in Hanoi (from 17.8% in 2009 to 6.3% in 2013 in IBBS) and Ho Chi Minh City (from 19.9% in 2009 to 18.1% in 2013 in IBBS). HSS+ data also indicates the same trend of sharing needles and syringes. In contrast, it increased in An Giang (from 33% in 2006 to 55.7% in 2013, in

IBBS for instance). Sharing needles and syringes among PWID in the last 6 month was very high in An Giang at 55.7%, follow by HCMC (18.1%), Ha Noi (6.3%) – IBBS 2013.

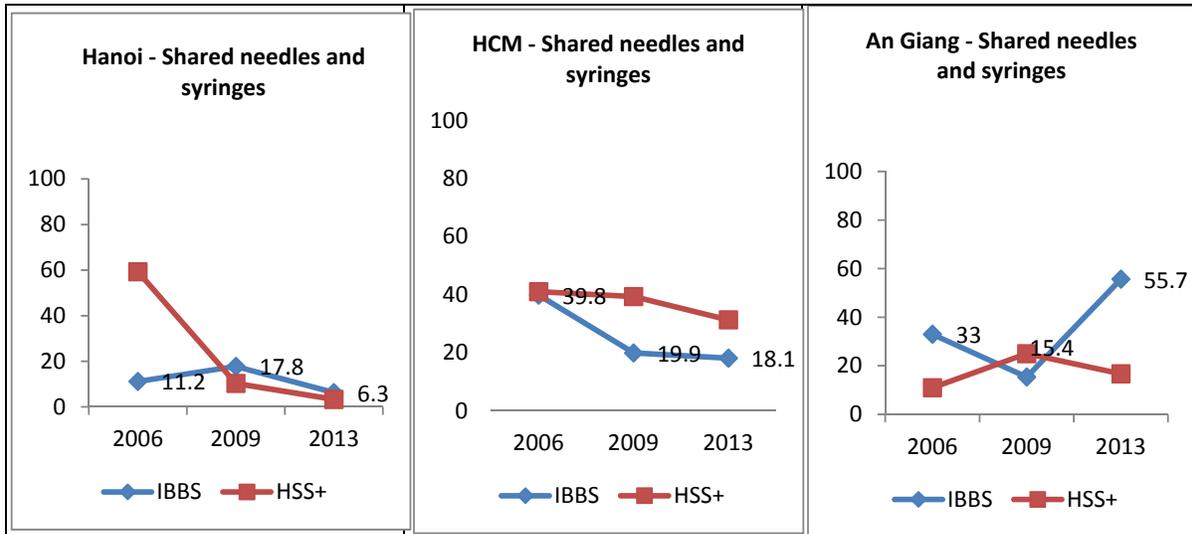


Figure 13: Figure. Shared needles and syringes in the last 6 months among PWID

The trend over time in both IBBS 2013 shows the proportion of PWID who received HIV testing and know their result statistically significant in the past several years, both IBBS and HSS+ data shows. However, it stabilized in An Giang according to both IBBS and HSS+ data.

The proportion of PWID in three provinces reported they received HIV testing and know their result in the past 1 year was low. It was 44.3% in Hanoi, following by Ho Chi Minh City at 33%, and An Giang at 27% (HSS+ 2012). The similar result was also showed in IBBS 2013 with 27.5% PWID in Hanoi, 21.1% PWID in Ho Chi Minh city, and 17.7% PWID in An Giang reported they received HIV testing and know their result in the past 1 year.

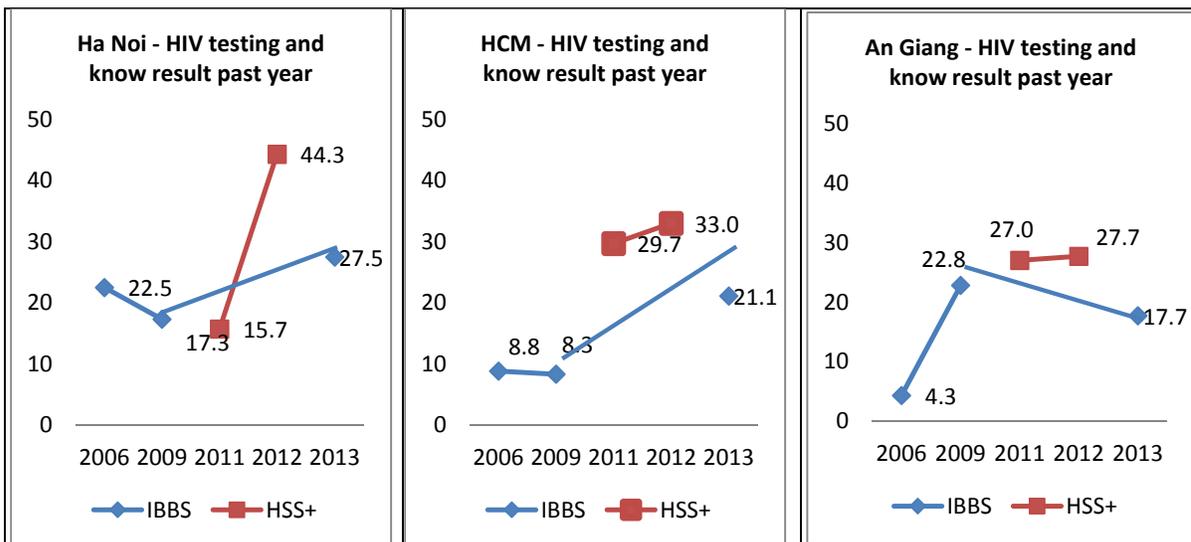


Figure 14: HIV testing and know result in the past 1 year among PWID

### Needles and Syringes programs

The coverage of the Needle and Syringe Program (NSP) has increased over the years. The average number of needles and syringes provided to PWID increased from 140 NS/PWID in 2011 to 180 in 2012. There are plans to expand the NSP, with new needles and syringes being distributed for free through peer educators, VCT and OPC sites, and fixed site boxes and at subsidized rates through pharmacies participating in pilot social marketing initiatives. Additionally, the NSP has been extended to additional districts as an effort of the Global Fund (GF) project.

The percentage of people who inject drugs who reported using sterile injecting equipment the last time they injected has slightly increased, from 95.3% in 2011, to 96.4% in 2012, and 97.3% in 2013 according to HSS+ data.

As a result, the data in Figure 15 indicates that NSP along with other harm reduction programs has contributed to the decrease in HIV prevalence among PWID.

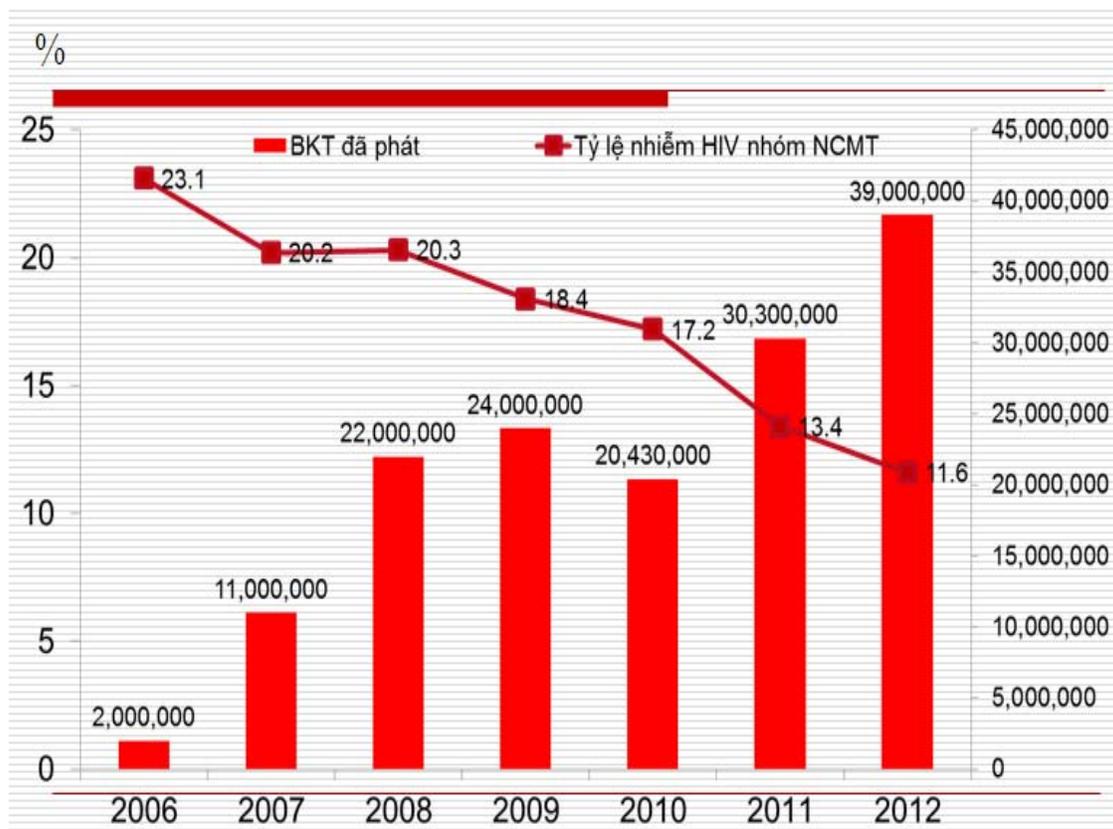


Figure 15: Needle and syringe program and HIV prevalence among PWID

## Methadone Maintenance Therapy (MMT)

The drug detoxification treatment program with methadone has been piloted in Viet Nam since 2008 and has gained positive results. The Government of Viet Nam has given directions to maintain, sustain, and expand the MMT program after the successful pilot. This is an important measure in harm reduction interventions for drug users, especially in preventing HIV infection from drug users to the community.

The Decree 96/2012/NĐ-CP on Substitution Treatment for Opioid Dependents was approved to simplify the administration procedure and increase accessibility to MMT services. As a result, the MMT services were expanded from 41 sites (6,931 patients) in 2011 to 60 sites (12,253 patients) in 2012, and to 80 sites (15,542 patients) in a total of 30 provinces in 2013 (Figure 16).

MMT has shown significant impacts on reduction of reported drug users involved in crime (from 49% to 2%) as well as risk behaviors after 12 months of treatment. The Proportion of MMT patients who reported continuing drug use declined from 16% to 11%; among those who inject drugs none of them reported sharing needles and syringes. Condom use among MMT patients with regular partners and sex workers increased to 44% and 100%, respectively. However, the coverage of the programme remains at a low level. Harm reduction received barely 1% of donor funding. Methadone Maintenance Treatment (MMT) was piloted in Hai Phong and Ho Chi Minh cities in 2008 and has expanded to other provinces. As of September of 2013, a total of 15,542 people were receiving MMT service. The Government has decided to expand MMT programme with a goal of 80,000 drug users on treatment by 2015. There seems to be high unmet needs.

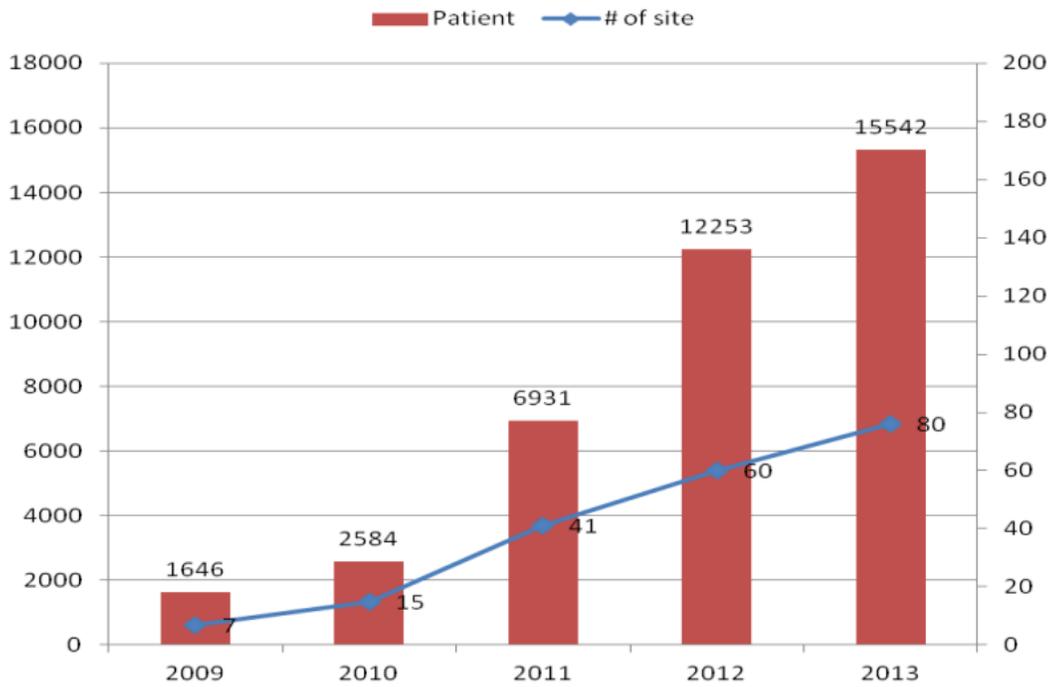


Figure 16: Methadone maintenance treatment program

However, the expansion of the MMT program suggests an evidence that the program has contributed to the success in controlling HIV epidemic among among PWID.

## IV. HIV epidemic among female sex workers: Decreasing overall but caution in some areas

HIV prevalence among FSWs peaked in 2001 and began declining in 2003, according to HSS data. However, there is a wide geographical variation. HIV prevalence among FSWs began declining in 2003. In 2011, at 3.0%, it reached a level not seen since 1998 (range: 0.0% in 6 provinces to 22.5% in Ha Noi).

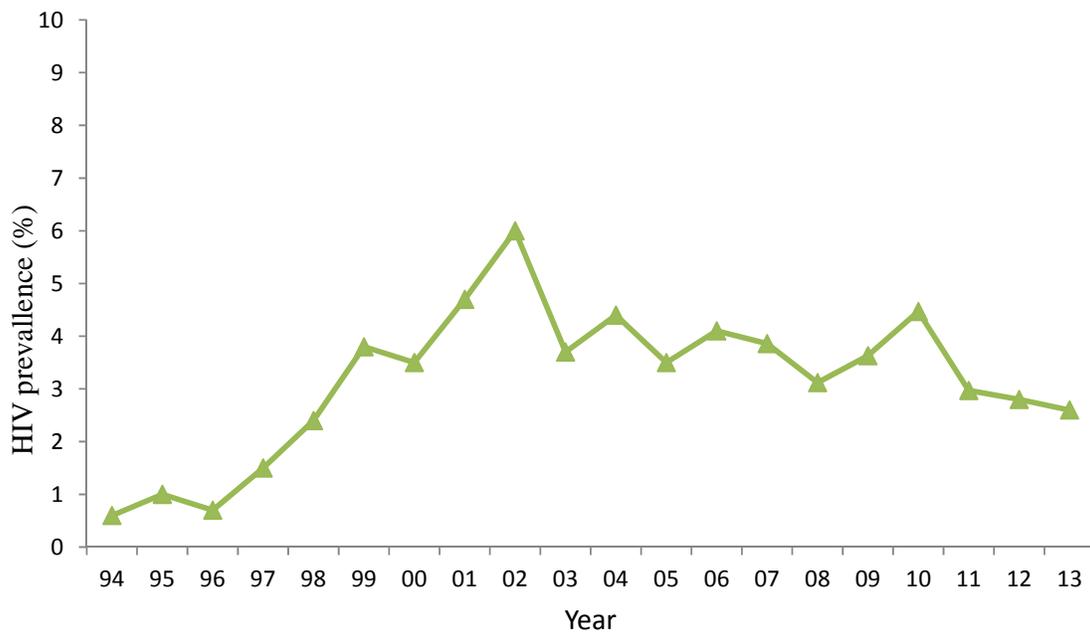


Figure 17: HIV prevalence among FSWs as measured by HSS.

HIV prevalence among FSWs was very high in Ha Noi and rather high in HCM and An Giang (HSS and IBBS data showed). HIV prevalence among SSW and VSW was significantly different. HIV prevalence among SSW was higher than VSW in Ho Chi Minh city (13.1% SSW compare to 9% VSW) and An Giang (7.1% SSW compare to 2.4% VSW). In contrast, HIV prevalence among SSW was lower than VSW in Hanoi (10.4% SSW compare to 13.9% VSW) (IBBS 2013).

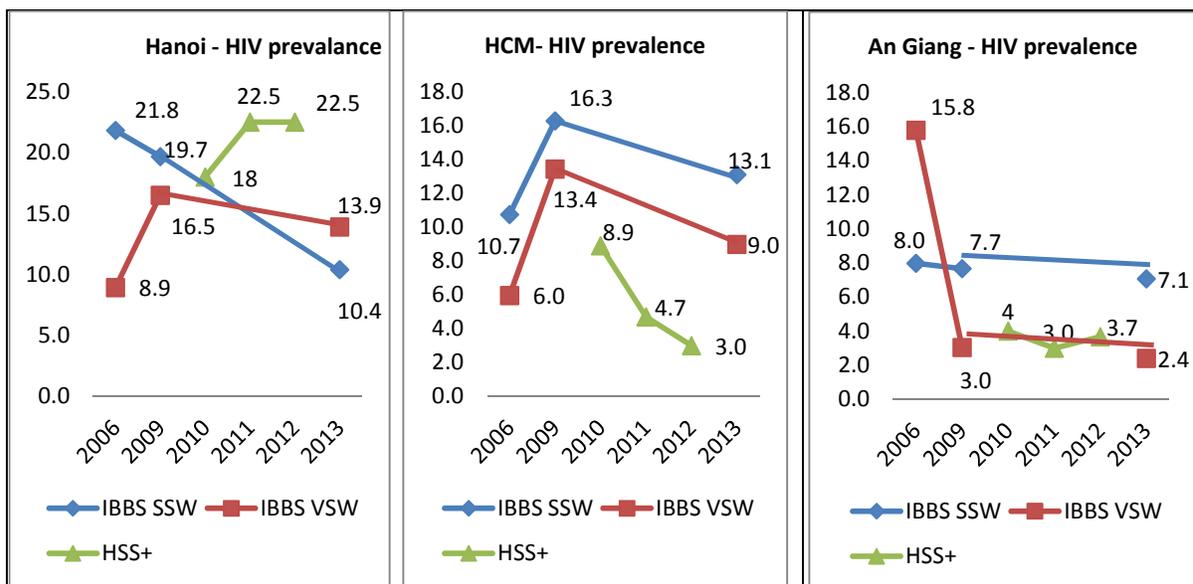


Figure 18: Trend of HIV prevalence among FSWs

The trend of HIV prevalence among FSWs over time in Ho Chi Minh city and An Giang has decreased and stabilized in the last several years. It was not clear in Hanoi, it seems to decrease among SSW but increase among VSW.

According to IBBS data, in the high HIV prevalence provinces, FSWs who had injected drugs had a 3-fold increased risk of HIV infection compared to FSWs who had never injected drugs, while in the lower HIV prevalence provinces FSWs who reported having injected drug were 26 times more likely to test HIV-positive than those who had never injected drug (Table 1).

Table 1: The association between drug use and HIV among FSW (source: IBBS)

Drug use	High HIV prevalence provinces		Low HIV prevalence provinces	
	OR*	95% CI**	OR	95% CI
Never drug use	1	-	1	-
Non-injecting drug use	1.73	1.17 - 2.56	2.32	0.78 - 6.92
Injecting drug	<b>3.18</b>	2.25 - 4.49	<b>26.07</b>	14.38 - 47.27

\*OR: Odd ratio; \*\*CI: Confident interval

Prevalence of STIs among FSWs has decreased in the last several years. This suggests that sexual risk behavior has decreased as a result from effectiveness of the condom use program targeting this key population.

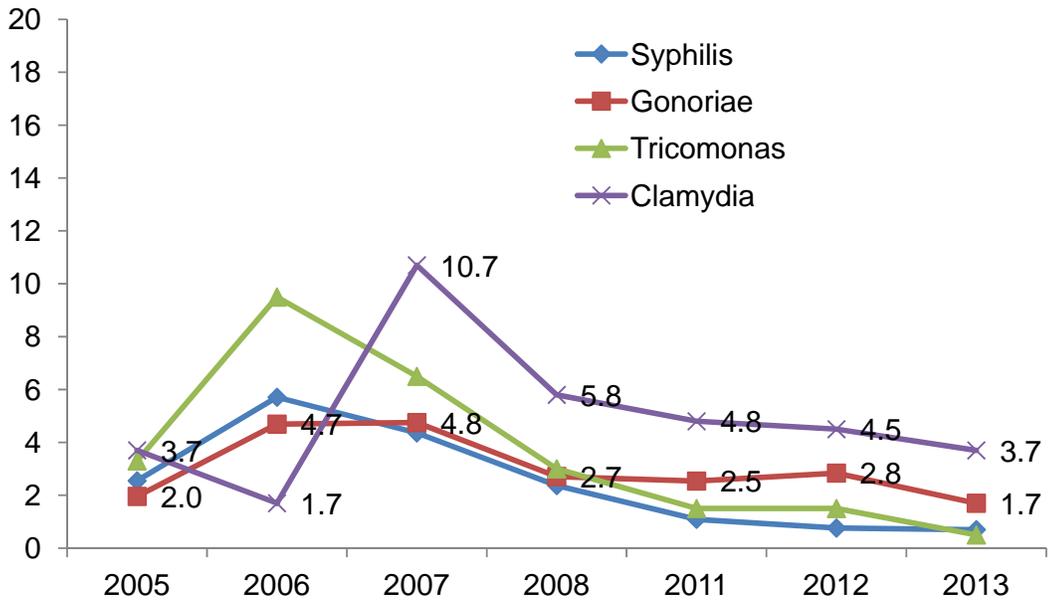


Figure 19: Prevalence of STIs among FSWs

Similarly, prevalence of STIs among STIs patients, who considered as clients of FSWs, has decreased in the last several years. This, again, suggests an evidence of effectiveness of condom use promotion program in the control of HIV and other STIs.

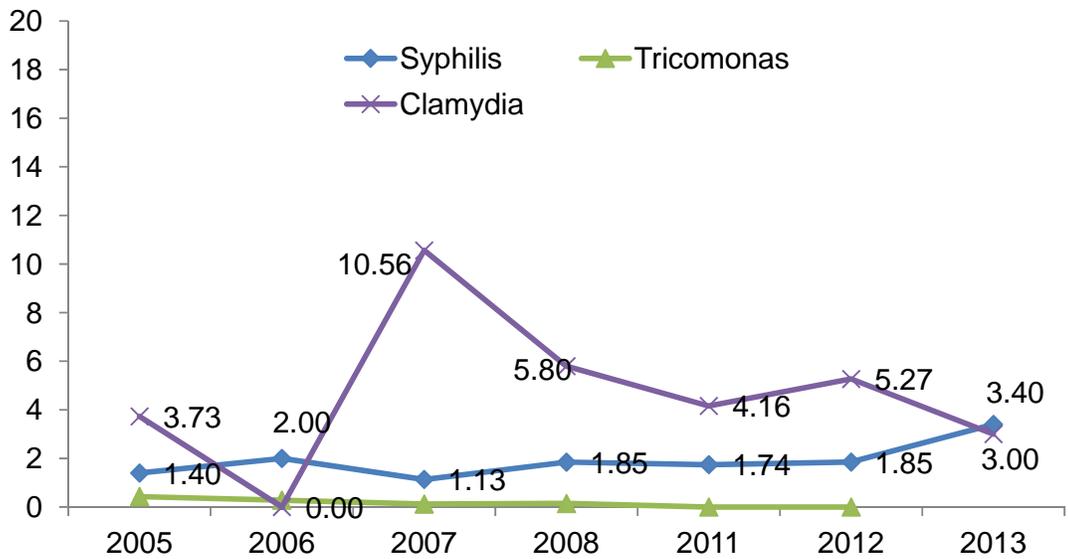


Figure 20: Prevalence of STIs among STI patients

Due to the unpredictable effect of the drug injecting behavior among FSWs, the HIV/AIDS estimates and projections show that HIV prevalence among FSWs from now to 2015 will

reach 5% because prevalence is very high in many areas, such as HCMC, Hai Phong, Nghe An and the Northwest region, particularly among drug injecting FSWs. FSWs are another population heavily affected by the HIV epidemic. Despite the relatively stable national prevalence, HIV prevalence among FSWs vary across cities and provinces with some remaining at much higher than the national average by 2015 (Can Tho, North West, An Giang and Ha Noi) (Figure 21). Therefore, prevention targeting FSWs must be comprehensive and include interventions for injecting FSWs, as well as care and treatment for those infected.

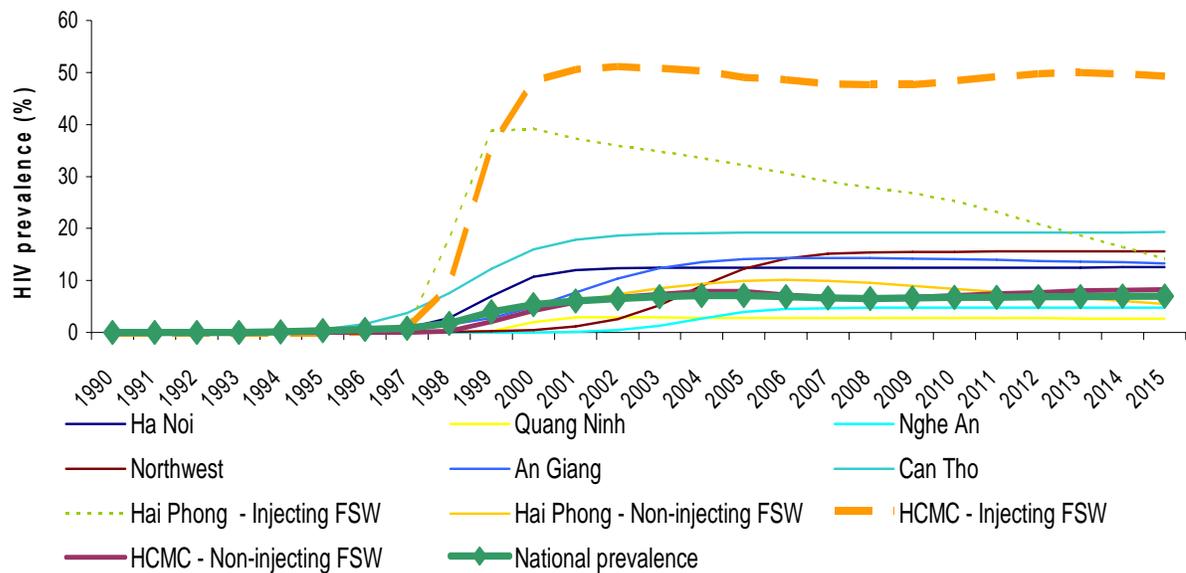


Figure 21: HIV prevalence among FSWs in Viet Nam, 1990–2015: National prevalence and prevalence in focus regions.

The trend of always use condoms when having sex with clients in the last month among FSWs has increased or stabilized in comparing provinces. For instance, there was an increasing trend in Ha Noi (both SSW and VSW) and An Giang (VSW) according to IBBS data. There was a stable trend of always use condoms when having sex with clients in the last month among FSWs in HCMC and An Giang (SSW). Unfortunately, there was an decreasing trend of always use condoms when having sex with clients in the last month among FSWs in HCMC among VSW and at rather low level.

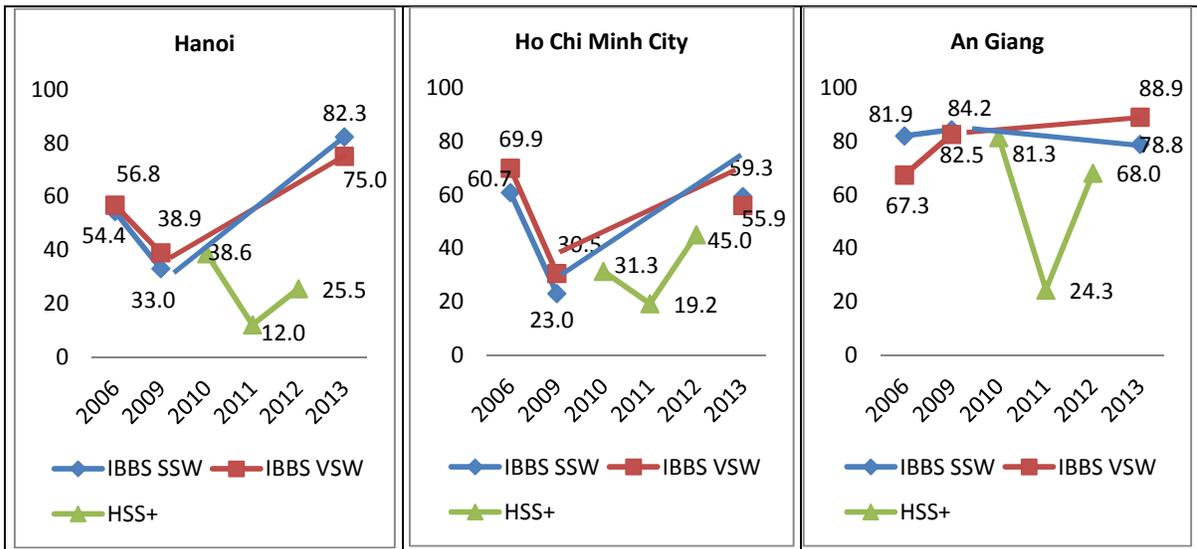


Figure 22: Always use condoms with clients in the last 1 month among FSWs

The proportion of FSWs who received HIV testing and know their result in the past 1 year was rather low. For instance 54% FSWs in Ha Noi, 52.3% FSWs in HCMC, and 49.3% FSWs in An Giang reported having received HIV testing and know their result in the past 1 year (HSS+ 2012).

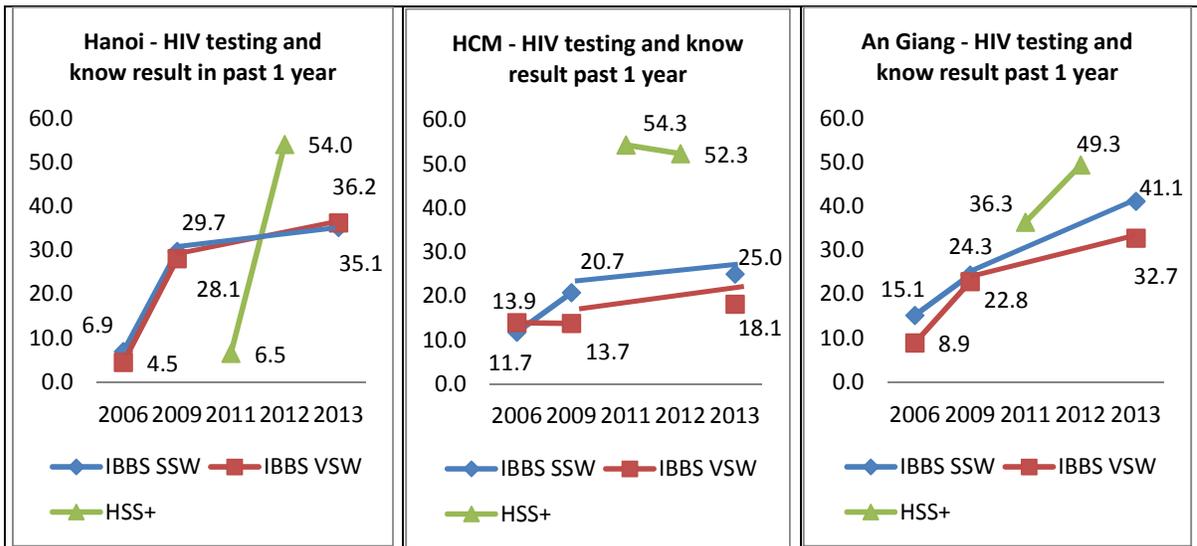


Figure 23: HIV testing and know result in the past 1 year among FSWs

Fortunately, the overall trend of voluntary HIV testing in provinces where both IBBS and HSS+ conducted has statistically homogeneous growth over the past several years, except among VSW (decreasing or stabilizing) in HCMC. This could be an indication of a preventive effect of VCT and other prevention services. The number of VCT centres has been increasing with support from international donors, and VCT services have effectively targeted high-risk

populations with high return rates. VCT is an effective HIV prevention strategy, given that the counselling has a preventive focus. It is also the entry point to care and support for PLHIV. The use of VCT among this high risk group has been low, e.g. in HCMC, need to be considered for future improvement.

The implementation of the National Comprehensive Condom Program for 2011–2020 particularly targets people at high risk of HIV infection and establishes a framework for more effective coordination, expanded market-based approaches and stronger linkages with HIV and sexual and reproductive health programs. In 2012, the program was expanded from 57 to all 63 provinces, the program was also expanded at commune and district levels and at the end of 2013 there were 439 districts with a condom promotion program. As of 2013, almost 14 million condoms had been distributed, mostly through peer educator channels. In addition to that, the condom social marketing program has showed its success. As of the 2012 report, 32 million condoms had been sold through the program.

HSS+ and IBBS 2013 data from 26 provinces indicates that 72.9% of SWs reported having received free condoms in the last month. According to the HSS+ and IBBS 2013 data, 92% of sex workers used a condom with their most recent client. As a result, the condom promotion program has contributed to the reduction of the sexual risk behavior among high risk populations and particularly to the reduction of HIV prevalence among FSWs.

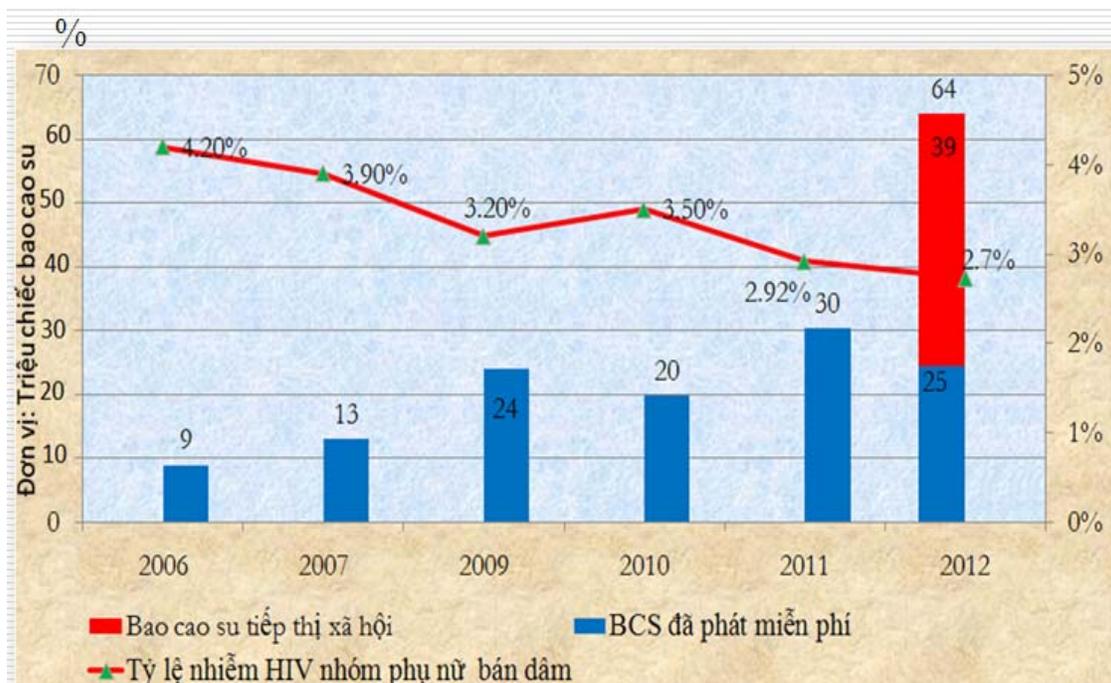


Figure 24: Condom distribution program and HIV prevalence among FSWs

## V. HIV epidemic among men who have sex with men: Unstable epidemic

The findings of HSS and IBBS also show that HIV prevalence among MSM varies in the provinces. Eight provinces collected HIV sentinel surveillance (HSS) data on MSM in 2011, revealing a mean HIV prevalence of 4% (range: 0.0% in Da Nang to 14% in HCMC).

In Ha Noi, overall trend of HIV prevalence was statistically significant decreasing according to IBBS data and stabilizing according to HSS data. Unlike in Hanoi, the overall trend of HIV prevalence in HCMC was statistically significant increasing according to IBBS data, however, HSS data shows a contradict trend. The differences between IBBS and HSS+ data may suggest that the two data sources captured difference populations due to the differences in methodology and catchment areas. This, therefore, needs to be further investigated.

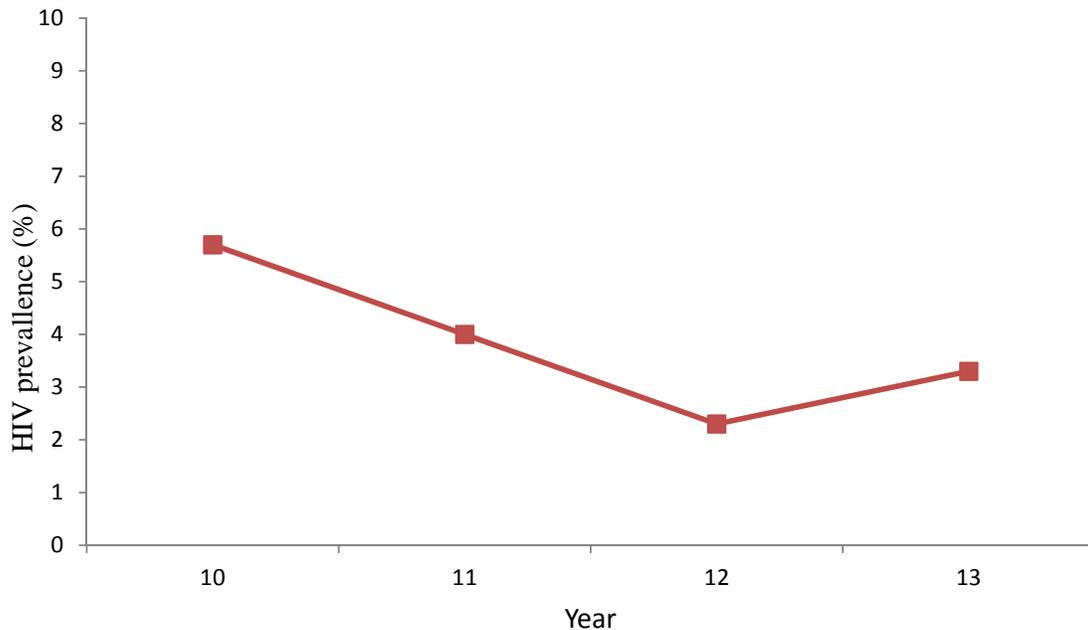


Figure 25: HIV prevalence among MSM as measured by HSS

According to EPP data, while the national HIV prevalence is expected to stay at relatively low level and increase slowly among low-risk MSM, from expected 1.4% to 2.1% during 2011 – 2015, the opposite situation is observed among high-risk MSM, with an estimated increase from 11.2% to 16.7% in the same period. The prevalence among high-risk MSM in HCMC and Hai Phong are particularly high, reaching up to 38% and 30% respectively by 2015. Given

limited data available among MSM population, there is still a degree of uncertainty on whether the estimates and projections for this group reflect the real situation, which may be either more or less serious. However, with the consistently increasing prevalence among MSM in other parts of Asia, surveillance and risk behavioral monitoring of these men should be expanded alongside with strengthened prevention efforts.

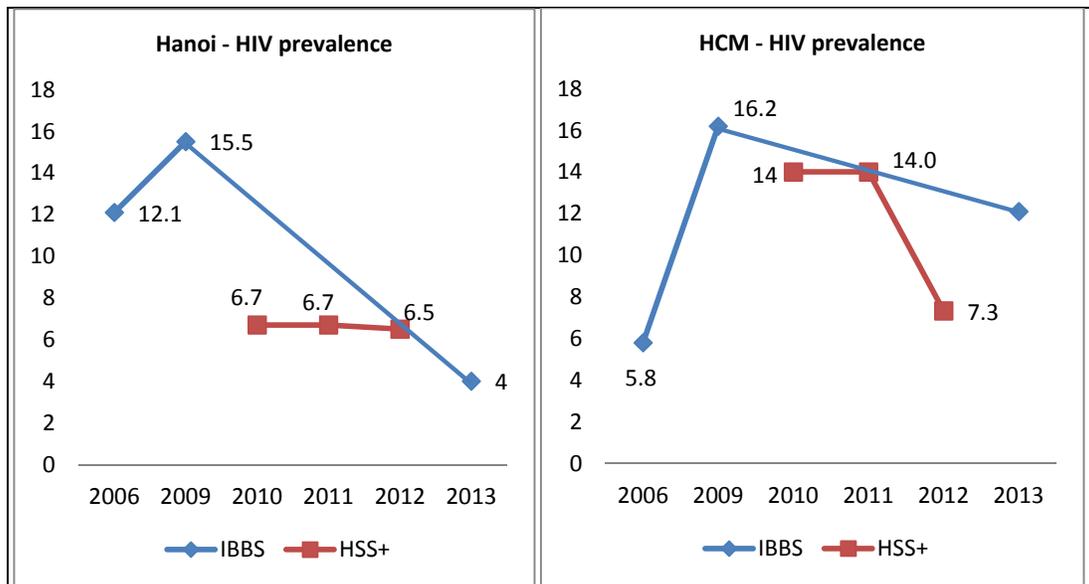


Figure 26: Trend of HIV prevalence among MSM over time

Research has shown high level of having use of amphetamines among MSM, especially among urban area, such as Ha Noi, HCMC, and Nha Trang where largest number of MSM gathering (Table 2).

Table 2: Percentage of having use of amphetamines (ATS) among MSM

	HCMC	Nha Trang	Ha Noi
Life (2009)	13%	-	5.50%
HAIVN (2010)	27%		
HMU (2011)	36%	18%	14%
Life (2011)	37%		

Source: HAIVN: Harvard university HIV/AIDS project; HMU: Ha Noi medical university; Life: Life for MSM project

Significant proportion of MSM in some urban areas also reported having sell sex in the past.

According to HSS+ data, drug injecting and selling sex among MSM are associated with HIV infection. For instance: those MSM with drug injection behavior 9.5 (95% CI: 4.7 – 19.2) and 5.3 (95% CI: 2.6 – 10.8) times are more likely to be infected with HIV than those who without (HSS+ 2010 and 2011, HCMC); those MSM reported selling sex 8.2 (95% CI: 1.4 – 46.5) and 7.7 (95% CI: 1.1 – 56.5) times are more likely to be infected with HIV than those who did not (HSS+ 2012, An Giang).

Table 3: Percentage of selling sex among MSM

	Can Tho	HCMC	Nha Trang	Ha Noi
HAIVN (2010)	5.30%	2.0%		
HMU (2011)		5.5%	11.0%	8.8%
Life (2011)		1.5%		

Source: HAIVN: Harvard university HIV/AIDS project; HMU: Ha Noi medical university; Life: Life for MSM project

Result of IBBS show that while the trend of always use condom with male partners in the last month among MSM in Hanoi increased (from 13.4% in 2006 to 43.1% in 2013), it was decreased in Ho Chi Minh (from 49.8% in 2006 to 41.1% in 2013). The trend of always use condom with male partners in the last month among MSM since 2011 in IBBS was quite similar to HSS+. However, unfortunately, both data shows low proportion of MSM reached by this service.

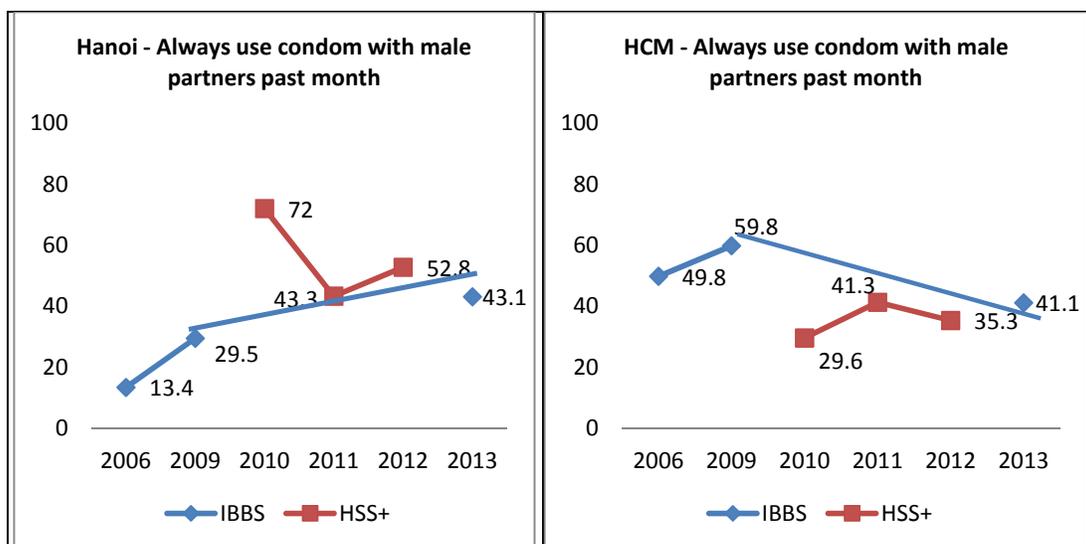


Figure 27: Always use condoms with male partners past 1 month among MSM

When comparing between result of HSS+ 2011 and HSS+ 2012, HIV testing and know the result among MSM in two provinces Hanoi and Ho Chi Minh City has increased sharply. It was increased from 28% in 2011 to 50% in 2012 in Hanoi, and from 37% in 2011 to 43% in HCMC. However, the data also suggest that the coverage of this service was at low level.

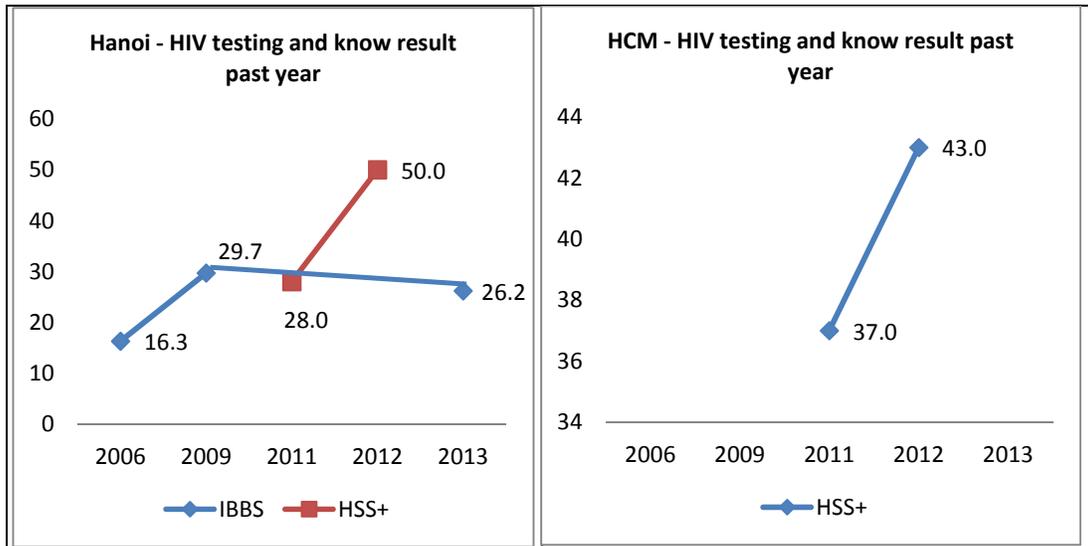


Figure 28: Received HIV testing and know result past 1 year among MSM

## VI. HIV epidemic among general population: Low level

The data indicates that HIV prevalence is very low in the general population. The HIV prevalence among military conscripts and ANC attendees in HSS was at a very low level and has been stable for years. There has been very few provinces in which HIV prevalence exceeded 1% among military conscripts and ANC attendees at some points.

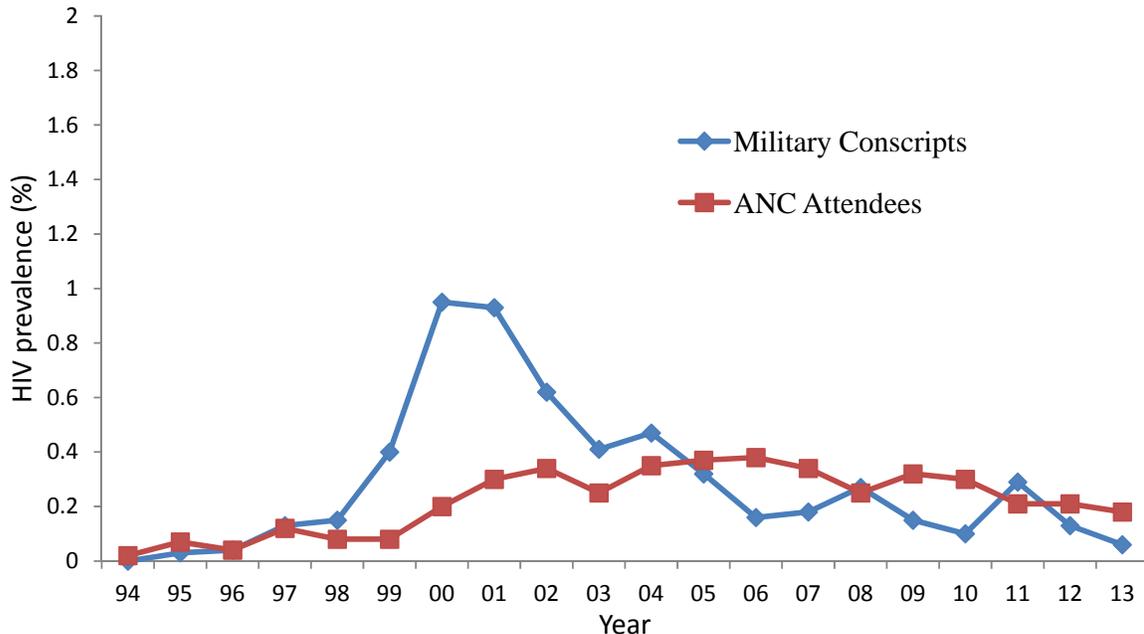


Figure 29: HIV prevalence among military conscripts and ANC attendees

HIV prevalence in the general population in very few population-based surveys data was very low (Figure 30). However, some research indicates that HIV prevalence was high among some minorities and partners of PWID in some areas such as Son La, Dien Bien, and Nghe An. These areas have very high HIV prevalence among PWID. This is very likely that HIV spread from those HIV positive to their regular partners.

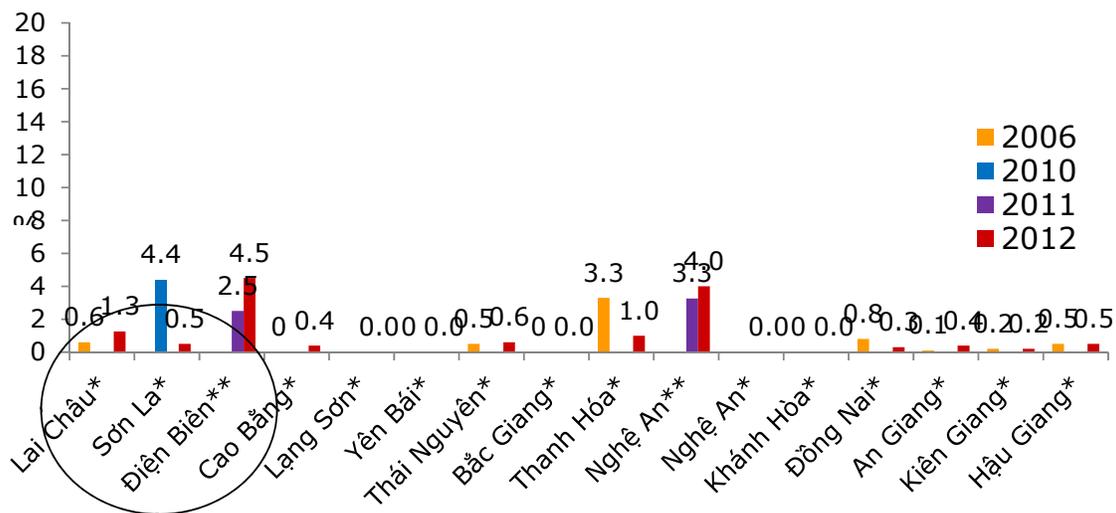


Figure 30: HIV prevalence among minorities and sexual partners of PWID. Source: NIHE's World Bank project and HSS.

Low proportion of general population reported having multiple sex partners may explain why HIV has not spread widely among general population in Viet Nam (Figure ).

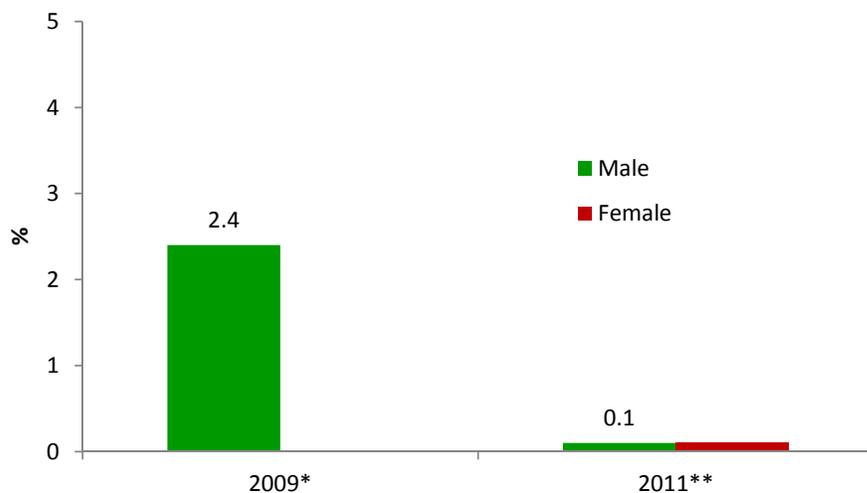


Figure 31: Percentage of having multiple sex partners in the last 12 months among general population

\*SAVY: National survey on adolescent and youth (15-24 years old)

\*\*MICS4: Multiple indicator cluster survey (15-49 years old)

## VII. Strength, limitations and data gap

### 7.1. Case reporting system

#### **Strengths**

HIV/AIDS case reporting has been in place in all 63 provinces of the country for almost 20 years. The system has grown and expanded over time as the number of voluntary testing and counseling (VCT) sites has expanded, and provider initiated testing has increased at health facilities, including TB and ANC sites. International donors have recently provided financial and technical support to improve the case reporting system, including development of the “HIV-Info” database and staff training. Plans are in place to conduct a systematic evaluation of the HIV/AIDS Case Reporting system, and the need to improve the quality and utilization of HIV/AIDS case report data is a recognized priority.

HIV/AIDS case reporting is the only data source that is routinely available, including in provinces with no HSS/(+) or IBBS. Although the usual biases associated with passive surveillance apply to HIV case reporting, (i.e. it is very much dependent on the profile of who is being tested over time), these data can still provide good insights into epidemic patterns at the provincial level. The HIV/AIDS case reporting system (HIV-Info) collects a lot of information about AIDS cases including name, gender, date of birth, place of birth, home address, occupation, risk behavior, risk group, transmission mode, HIV/AIDS vital status, and date of diagnosis. More variables were added in 2012 including national ID number, ethnicity, self-reported and verified address, ART status, cause of death. At VTC sites where professional counselors are available, the quality of the data collected, especially about risk behavior, is of better quality than what is collected in health facilities.

#### **Potential limitations**

HIV/AIDS case reports are dependent on who is getting tested over time. These patterns can change in response to many factors, such as level of outreach efforts through PACs and other interventions, changes in provider behavior (which can affect provider initiated testing patterns), expanded availability of testing as the number of VTC sites increases, perception of quality of services offered at testing sites, etc. As the composition of the population being tested over time changes, so does the pattern of reported HIV cases.

Despite efforts to keep the case reporting database current. People being tested have the option to “declare” their identity or to remain anonymous. In theory, only those who declare their identity get reported in the HIV-info data base, and the identity of those individuals is verified at the commune level. So this brings the validity of the reporting into question, and opens up the possibility for a significant amount of duplication in the system. People who “lost to follow-up” for six months or more may be re-diagnosed and entered into the system as new cases if they return for care. This sometimes happens when patients are transferred between provinces, or do not show up for care for extended periods. In the absence of individual case management and unique identifiers, the potential for counting cases multiple times exists and is hard to manage.

The quality of the information recorded, particularly with respect to mode of transmission, is still poor, many reported in the “unknown” category.

## **7.2. HSS and HSS (+)**

### **Strengths**

HIV sentinel surveillance in Vietnam has been in place since 1994 providing routine sentinel surveillance data among people who inject drugs (PWID), commercial sex workers (CSW), urban and rural pregnant women, males with sexually transmitted diseases (STD), tuberculosis patients (TB) and military recruits.

The sentinel provinces joining the HSS system have increased rapidly over the last 20 years. This system was set up in 10 provinces in 1994, and the program was expanded to 12 provinces in 1995, 20 provinces in 1996, and 30 provinces in 2001, 40 provinces in 2003, and 41 provinces in 2013. Trends HIV prevalence over time should therefore be analyzed carefully.

The representativeness of the surveillance data, however, is uncertain. In some provinces, sampling for PWID and FSWs is based on a convenient method and might relate to a very high risk population. In early years, the sampling for these 2 high risk populations (PWID and FSWs) was half in the rehabilitation centers and half in the community. Those sent to the centers depend very much on the activities of crack-down campaigns by the police, making the representativeness of the data uncertain.

HSS (+) began in 7 provinces in 2010, and expanded to 12 provinces in 2011 and 29 provinces in 2012. HSS (+) is similar to HSS, but with the addition of a limited number of behavioral questions. The results of the HSS (+) pilot indicated that the approach can be used to monitor behavioral trends and to estimate incidence (by looking at prevalence in those who recently initiated risk behavior). Naturally the quality of the data is not as good as IBBS data, but it may be good enough for surveillance purposes, where the data do not need to be exact.

Despite these limitations, surveillance-based estimates may be reasonable good markers for the overall prevalence trends, since prevalence complies well with population-based estimates.

### **Potential limitations**

It is difficult to identify eligible respondents, particularly key populations (KPs) (FSWs, PWIDs and MSM). So people who are not eligible are often included, while others who would be eligible are missed.

Refusal rates tend to be quite high. Some places report refusal as high as 50%. There are many possible explanations for the high refusal. In provinces where both IBBS and HSS/HSS (+) are conducted, it is difficult for HSS (+) to compete with the incentive structure used for IBBS, which is more than double or triple the amount used for HSS (+). Also, as VTC is increasingly available, and HSS/HSS (+) and VTC are targeting the same people, it is natural that willingness or motivation for KPs to participate in the surveys will lessen, especially for those who are HIV positive. This will only increase over time as the goal of early testing and treatment become a reality.

Already it sometimes happen that HIV positive persons are excluded from surveillance because their status is already known. Obviously this interferes with prevalence estimates.

All respondents for HSS are recruited by peer educators. This raises the concern that people recruited by PEs may be more exposed to education and interventions, and thus be at lower risk. There is also the concern that having PEs recruit respondents for HSS can be a conflict of interest and contribute to bias.

Flexibility - One of the cornerstones of surveillance is the need to use consistent sites over time so that trends can be captured accurately. This is certainly an important principle, but

if it is taken to extremes, it can threaten the ability of the system to capture the current epidemic situation, e.g. there are new locations and groups where the epidemic may be more severe.

### **7.3. IBBS**

There have been three rounds of IBBS surveys (2006, 2009, 2013) in provinces with PEPFAR funding and also several IBBS surveys (sometimes just a single round) in provinces with WB and GFATM funds. IBBS surveys are entirely funded by donors, primarily for evaluation purposes.

#### **Strengths**

IBBS was very important and provided valuable information. The sampling approach is appropriate for the population, e.g. the use of respondent driven sampling method to capture hidden populations. Surveys have strong methodology with well-defined indicators, and use well-designed questionnaires, tested for their ability to measure the indicators in appropriate languages. There was adequate supervision and monitoring during fieldwork. There is evidence that sampling procedures are followed.

There are appropriate data entry procedures with adequate error-checking routines, e.g. the use of tablet for data collection in the field.

Privacy and confidentiality is respected and protected during data collection, e.g. results not linkable to individuals. Therefore, the information provided by participants was reliable.

#### **Limitations**

Self-report bias:

Like many other research, the research team employed a number of tactics to limit reporting bias. All interviews were conducted in private, surveys were anonymous, and respondents were encouraged to provide accurate responses. However, respondents may have underreported certain behaviors, particularly those pertaining to drug use and unprotected sex, given the high social stigma of these illicit activities. In most provinces, FSWs reported very high condom use at last sex, while the true figures are likely to be lower. FSWs and MSM may also have underreported drug use, given the dual stigma of sex work and homosexuality with drug use, or over-reported preventive behaviors. As a result, some

indicators of risk behaviors are likely to be conservative estimates, while reported preventive behaviors may actually be lower than in the actual population.

Also, given that some of the research centers were located in drop-in centers that provide HIV prevention interventions for most-at-risk populations, individuals who had visited those centers for services were probably more likely to participate than those who had not. As a result of this potential self-reporting bias, the actual coverage of interventions may be lower than observed, and risk behaviors may be higher than observed in this study.

#### Representativeness

A few things may have affected the representativeness of the samples. The team conducted random sampling using a sampling frame with mapping process. Mapping was utilized to determine the location where targeted individuals tend to congregate and could be accessed. The field research team was then broken into groups of 3-5 officials to conduct the research (two weeks for each MARP group). Due to limited time and human resources, the teams may have overlooked some mapped spots and not included them in the sample frame. In other cases, researchers were unable to access individuals at mapped locales (e.g. prevented by police raids, entertainment establishment owners...etc.) In addition, “high class” FSWs who charge a higher premium for their services and tend to use mobile phones for arranging meetings do not frequent hotspots, and therefore would not have been included in the sampling frame.

Methodology is not consistent with previous rounds in some populations in some provinces. This may limit comparability across rounds.

IBBS samples were drawn from the community and did not include those residing in rehabilitation centers at the time of the survey. Therefore, in provinces where a large proportion of IDUs were in rehabilitation centers during the time of the study, the samples may not have been representative of those provinces’ IDU populations.

#### Sampling error

RDS has been widely used as a data collection method for hard-to-reach populations. However, there are a number of assumptions and emerging issues that require further evaluation for this method, including refusal rates, selection of ‘seeds’, and the extent to which selection can be randomized when using network populations. The reported versus

actual size of networks also critically affects outcomes. The bullets below highlight possible sampling errors that may result when RDS is used.

Certain 'seeds' selected from specific populations (i.e. IDUs) may limit the selection of subjects from sub-groups within those populations. For example, older IDU seeds may be less likely to interact with younger IDUs; working class MSM seeds may have little interaction with MSM in schools.

One RDS assumption is that seeds and selected subjects will continue to select individuals from their network. However, some individuals do not always recruit members from their network, but rather go to "hot spots" and provide coupons to anyone they meet (even if they do not know each other).

The rigor with which individuals are selected across sub-groups varies. Sometimes individuals will choose others who are easy to reach, hence they may not be fully representative of their populations.

The team tried to minimize error from this last bullet by adjusting the number of coupons distributed (fewer coupons were distributed in the easier-to-reach networks, while more were distributed in the harder-to-reach networks). However, this approach does not completely eliminate the limitation. For example, forty percent of MSM and sex workers reported that they had acquired representative samples, though the percentage is likely much lower.

#### **7.4. Data gaps**

With the scale up of antiretroviral therapy program, HIV prevalence will increase because there are more people living with HIV and receiving antiretroviral therapy. In this case, measuring new infections or incidence became more important for measuring the HIV epidemic.

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## Appendix

## HIV/AIDS/Dead reported case from 2010 to 2013

### HIV/AIDS/Dead reported by years

	2010'	2011'	2012'	2013'
HIV	16603	17780	14127	12559
AIDS	8958	9138	6734	6074
Dead	3326	3287	2149	2296

### Commulative people living with HIV/AIDS and dead due to AIDS by years

	2010'	2011'	2012'	2013'
HIV	184232	198725	210703	217008
AIDS	51233	57084	61669	66755
Dead	57936	61223	63372	69062

### Route of transmission among HIV reported cases by years

	2010'	2011'	2012'	2013'
Unknown	9.0%	9.5%	10.1%	10.1%
Mother to child	2.9%	2.4%	2.4%	2.5%
Sexual transmission	38.7%	41.4%	45.5%	45.0%
Blood transmission	49.4%	46.7%	42.1%	42.4%

### HIV reported cases distributed by gender by years

	2010'	2011'	2012'	2013'
Nam	70.7%	69.2%	68.5%	66.0%
Nũ	29.3%	30.8%	31.5%	34.0%

### HIV reported cases distributed by age group by years

	0-14	15-19	20-29	30-39	40-49	>=50	unknown
2010'	2.9%	1.7%	40.9%	41.1%	10.0%	3.2%	0.2%
2011'	2.5%	1.7%	38.6%	42.9%	11.1%	2.9%	0.1%
2012'	2.6%	1.6%	35.1%	44.6%	12.2%	3.8%	0.1%
2013'	2.6%	1.7%	32.9%	45.1%	13.7%	3.9%	0.0%

**HIV prevalence among IDUs 2005 - 2020 clusters in Vietnam (round 2013)**

Clusters	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Hà Nội	31.91	31.17	30.09	28.86	27.50	26.18	24.77	23.25	21.66	20.29	18.88	17.66	16.46	15.24	14.08	13.08
Hải Phòng	56.15	53.17	49.76	45.97	42.03	38.16	34.37	30.62	27.10	23.94	21.13	18.61	16.36	14.33	12.54	10.94
Quảng Ninh	89.75	86.47	82.77	78.40	73.76	69.30	64.67	59.39	54.20	48.64	43.58	38.47	33.77	29.70	26.06	22.72
Nghệ An	30.29	30.67	30.93	31.01	31.09	31.15	31.22	31.15	31.00	30.87	30.80	30.73	30.66	30.55	30.44	30.32
Thanh Hoá	39.36	39.11	38.98	38.94	38.98	38.95	38.91	38.59	38.49	38.45	38.51	38.55	38.52	38.47	38.40	38.34
NORTH WEST	39.97	43.35	44.99	45.85	45.72	45.04	43.72	42.12	40.20	38.08	36.05	34.84	33.42	31.52	29.45	27.55
NORTH EAST	26.45	25.48	24.57	23.58	22.75	22.13	21.41	20.59	19.80	19.20	18.66	18.15	17.86	17.46	17.19	16.75
NORTH PLATEAU	34.54	36.61	37.40	37.07	35.97	34.16	32.18	30.03	27.41	24.77	22.42	20.02	17.89	15.94	14.11	12.49
Thái Nguyên	35.45	37.73	39.27	40.21	41.10	41.79	41.85	41.83	41.67	41.53	41.39	41.11	40.95	40.79	40.62	40.47
RED RIVER DELTA	35.96	33.35	30.08	26.69	23.46	20.48	17.80	15.36	13.21	11.47	10.00	8.72	7.61	6.62	5.76	5.01
NORTH CENTRAL	12.33	10.71	9.25	7.91	6.79	5.82	5.00	4.28	3.68	3.18	2.74	2.37	2.05	1.78	1.54	1.33
CENTRAL COAST	17.60	16.41	15.36	14.20	13.34	12.46	11.92	11.18	10.50	9.78	8.98	8.35	7.62	7.01	6.50	6.02
Khánh Hoà	60.76	55.06	49.12	43.35	38.09	33.38	29.25	25.45	22.17	19.23	16.66	14.41	12.46	10.76	9.28	8.01
HIGH PLATEAU	23.29	21.77	20.23	18.82	17.71	16.40	15.72	14.90	13.91	12.82	11.91	11.19	10.42	9.82	9.09	8.60
SOUTH CENTRAL COAST	15.08	15.29	15.58	15.87	16.39	16.75	16.96	16.98	16.99	17.04	17.13	17.14	17.17	17.23	17.25	17.25
SOUTH EAST	28.58	28.80	28.61	28.30	27.95	27.48	26.94	26.18	25.41	24.52	23.78	23.09	22.41	21.76	21.25	20.76

<b>MEKONG RIVER DELTA</b>	26.64	23.66	20.71	18.04	15.77	13.83	12.16	10.65	9.34	8.13	7.03	6.08	5.25	4.53	3.91	3.38
<b>An Giang</b>	40.26	37.38	34.12	30.71	27.40	24.24	21.26	18.45	15.96	13.92	12.20	10.69	9.36	8.17	7.13	6.21
<b>Cần Thơ</b>	33.40	33.28	32.43	32.35	32.27	31.48	31.45	31.28	30.90	30.14	30.16	30.21	29.95	29.91	29.87	29.83
<b>TP. Hồ Chí Minh</b>	45.63	45.76	45.51	44.45	42.88	40.10	37.63	34.90	31.95	29.09	26.27	23.32	20.86	18.57	16.42	14.48
<b>Total</b>	<b>29.96</b>	<b>29.78</b>	<b>29.13</b>	<b>28.21</b>	<b>27.13</b>	<b>25.78</b>	<b>24.49</b>	<b>23.08</b>	<b>21.85</b>	<b>20.56</b>	<b>19.30</b>	<b>18.14</b>	<b>17.06</b>	<b>16.01</b>	<b>15.02</b>	<b>14.12</b>

**HIV prevalence among FSWs 2005 - 2020 by clusters in Vietnam**

Clusters	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Hà Nội	14.63	14.67	14.67	14.67	14.68	14.70	14.71	14.72	14.70	14.63	14.60	14.56	14.54	14.51	14.48	14.45
Hải Phòng	14.27	14.27	14.24	14.28	14.30	14.32	14.34	14.29	14.28	14.21	14.20	14.21	14.10	14.07	14.04	14.02
Quảng Ninh	2.50	2.49	2.46	2.39	2.38	2.34	2.30	2.29	2.25	2.23	2.23	2.21	2.20	2.20	2.19	2.18
Nghệ An	1.61	1.61	1.61	1.60	1.58	1.58	1.58	1.58	1.58	1.57	1.58	1.58	1.58	1.58	1.58	1.58
Thanh Hoá	3.11	3.11	3.11	3.09	3.07	3.08	3.08	3.08	3.08	3.07	3.07	3.08	3.06	3.05	3.05	3.04
NORTH WEST	8.40	8.57	8.72	9.13	9.20	9.19	9.13	9.00	8.96	9.15	9.18	9.21	9.23	9.21	9.20	9.20
NORTH EAST	3.81	4.07	4.31	4.59	4.92	5.08	5.19	5.27	5.35	5.41	5.49	5.50	5.50	5.49	5.47	5.45
NORTH PLATEAU	1.52	1.74	1.92	2.11	2.31	2.50	2.66	2.81	2.89	2.93	2.97	2.97	2.98	2.97	2.98	2.97
Thái Nguyên	3.45	3.88	4.26	4.60	4.77	4.90	5.01	5.04	5.04	5.02	5.01	5.01	5.00	4.98	4.96	4.94
RED RIVER DELTA	6.31	6.31	6.31	6.32	6.33	6.34	6.33	6.30	6.26	6.23	6.23	6.23	6.22	6.21	6.21	6.22
NORTH CENTRAL	0.68	0.82	0.97	1.15	1.35	1.61	1.89	2.25	2.65	3.10	3.59	4.11	4.70	5.40	6.15	6.93
CENTRAL COAST	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.44	0.47	0.47	0.48	0.49	0.50	0.51	0.51
Khánh Hoà	2.42	2.54	2.58	2.61	2.60	2.58	2.54	2.54	2.53	2.52	2.50	2.49	2.41	2.39	2.39	2.35
HIGH PLATEAU	1.93	1.94	1.96	1.97	2.00	2.05	2.14	2.16	2.25	2.25	2.28	2.33	2.35	2.36	2.37	2.38
SOUTH CENTRAL COAST	1.29	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.26	1.26	1.27	1.27	1.27	1.27	1.27
SOUTH EAST	2.05	2.01	1.92	1.88	1.86	1.83	1.78	1.77	1.75	1.74	1.74	1.74	1.74	1.74	1.73	1.73
MEKONG RIVER DELTA	2.29	2.29	2.30	2.33	2.37	2.41	2.44	2.45	2.45	2.44	2.44	2.44	2.45	2.46	2.46	2.46
An Giang	4.13	4.06	4.06	4.07	4.08	4.09	4.10	4.10	4.07	4.05	4.04	4.04	4.03	4.02	4.01	4.00
Cần Thơ	13.40	13.95	14.26	14.38	14.52	14.58	14.65	14.64	14.66	14.58	14.52	14.45	14.38	14.32	14.25	14.18
TP. Hồ Chí Minh	9.13	9.13	9.12	9.13	9.14	9.15	9.16	9.16	9.15	9.11	9.09	9.08	9.06	9.05	9.03	9.02
<b>Total</b>	<b>4.87</b>	<b>4.92</b>	<b>4.97</b>	<b>5.02</b>	<b>5.08</b>	<b>5.17</b>	<b>5.20</b>	<b>5.25</b>	<b>5.34</b>	<b>5.37</b>	<b>5.40</b>	<b>5.43</b>	<b>5.44</b>	<b>5.45</b>	<b>5.49</b>	<b>5.51</b>

**HIV prevalence among high risk MSM 2005 - 2020 by clusters in Vietnam**

Clusters	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Hà Nội	4.46	5.13	5.75	6.31	6.82	7.15	7.38	7.52	7.58	7.61	7.64	7.67	7.70	7.67	7.65	7.59
Hải Phòng	5.64	5.77	5.84	5.87	5.93	5.91	5.90	5.84	5.77	5.71	5.69	5.67	5.66	5.65	5.64	5.63
Quảng Ninh	4.58	4.70	4.73	4.75	4.82	4.80	4.79	4.74	4.69	4.66	4.63	4.61	4.60	4.59	4.59	4.58
Nghệ An	0.49	0.54	0.57	0.61	0.65	0.71	0.75	0.77	0.84	0.86	0.90	0.91	0.93	0.93	0.93	0.93
Thanh Hoá	0.48	0.52	0.56	0.60	0.64	0.69	0.75	0.77	0.83	0.86	0.90	0.92	0.93	0.93	0.93	0.93
NORTH WEST	0.47	0.51	0.55	0.58	0.61	0.66	0.71	0.75	0.80	0.84	0.88	0.90	0.90	0.91	0.93	0.93
NORTH EAST	0.48	0.51	0.55	0.59	0.62	0.68	0.74	0.78	0.84	0.87	0.91	0.93	0.94	0.94	0.94	0.94
NORTH PLATEAU	0.46	0.51	0.55	0.59	0.64	0.68	0.74	0.78	0.83	0.87	0.92	0.93	0.94	0.95	0.95	0.94
Thái Nguyên	0.75	0.80	0.86	0.92	1.00	1.08	1.15	1.20	1.32	1.35	1.40	1.42	1.42	1.43	1.44	1.44
RED RIVER DELTA	0.49	0.52	0.56	0.60	0.63	0.69	0.75	0.79	0.85	0.89	0.93	0.94	0.96	0.96	0.96	0.96
NORTH CENTRAL	0.25	0.30	0.34	0.39	0.44	0.48	0.52	0.56	0.58	0.62	0.64	0.67	0.72	0.77	0.79	0.79
CENTRAL COAST	0.09	0.11	0.13	0.15	0.18	0.20	0.22	0.24	0.26	0.28	0.30	0.33	0.36	0.38	0.40	0.43
Khánh Hoà	0.36	0.41	0.46	0.52	0.58	0.64	0.69	0.76	0.81	0.86	0.90	0.95	0.98	1.01	1.02	1.05
HIGH PLATEAU	0.29	0.33	0.38	0.41	0.45	0.49	0.54	0.58	0.62	0.65	0.69	0.72	0.77	0.80	0.82	0.83
SOUTH CENTRAL COAST	0.29	0.33	0.38	0.41	0.45	0.49	0.54	0.58	0.62	0.65	0.69	0.72	0.77	0.80	0.82	0.83
SOUTH EAST	0.27	0.32	0.36	0.40	0.44	0.49	0.54	0.59	0.62	0.66	0.71	0.74	0.78	0.83	0.87	0.89
MEKONG RIVER DELTA	0.43	0.49	0.56	0.64	0.73	0.81	0.88	0.93	0.99	1.07	1.15	1.23	1.31	1.37	1.45	1.49
An Giang	0.51	0.60	0.71	0.79	0.88	0.96	1.05	1.13	1.19	1.29	1.39	1.42	1.47	1.51	1.54	1.56
Cần Thơ	1.56	1.63	1.74	1.84	1.95	2.09	2.19	2.19	2.17	2.17	2.18	2.18	2.17	2.17	2.18	2.18
TP. Hồ Chí Minh	6.48	6.87	7.22	7.52	7.74	7.92	8.13	8.21	8.19	8.18	8.17	8.15	8.09	8.05	8.02	7.99
<b>Total</b>	<b>1.66</b>	<b>1.80</b>	<b>1.94</b>	<b>2.06</b>	<b>2.17</b>	<b>2.25</b>	<b>2.33</b>	<b>2.37</b>	<b>2.42</b>	<b>2.46</b>	<b>2.49</b>	<b>2.51</b>	<b>2.53</b>	<b>2.54</b>	<b>2.55</b>	<b>2.55</b>