

**FACTORS AFFECTING SEXUAL RISK BEHAVIOR  
AMONG INJECTING DRUG USERS IN VIETNAM**

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entitled  
**FACTORS AFFECTING SEXUAL RISK BEHAVIOR  
AMONG INJECTING DRUG USERS IN VIETNAM**

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**FACTORS AFFECTING SEXUAL RISK BEHAVIOR AMONG INJECTING DRUG USERS IN VIETNAM****VU VAN CHIEU 5238648 PRRH/M****M.A (POPULATION AND REPRODUCTIVE HEALTH RESEARCH)****THESIS ADVISORY COMMITTEE: URAIWAN KANUNGSUKKASEM, Ph.D.,  
CHALERMPOL CHAMCHAN, Ph.D.****ABSTRACT**

This study examined the effects of personal and environmental factors on sexual risk behavior among injecting drug users (IDUs) in Vietnam. Secondary data from the cross-sectional survey on “Final evaluation of Preventing HIV Project in Vietnam” was used for analysis. The survey was conducted in 7 Vietnamese provinces between November 2008 and January 2009. From these areas, 587 IDUs who have had sexual intercourse in the last 12 months were selected for this analysis. Binary logistic regression examined the influencing factors on having higher risk sex and inconsistent condom use, which were considered to be sexual risk behaviour of IDUs.

The results show that IDUs have high knowledge of HIV, but their knowledge of STI is still low. The percentage of IDUs engaged in higher risk sex is 79%, while inconsistent condom use at 28%. IDUs who shared a syringe are more likely to be involved in higher risk sex by 4.7 times, and to use condoms inconsistently by 2 times. Married IDUs are less likely to be involved in higher risk sex, but they are more likely to use condoms inconsistently by 2.6 times. IDUs who have higher knowledge of HIV are less likely to be involved in higher risk sex. IDUs from 35-44 years old as compared with those 15-24 years old, and who received free condoms are more likely to use condoms consistently at 51% and 36%, respectively.

The evidence of significant association of sexual risk behaviour and syringe sharing advises that HIV preventive activities are effective. To prevent HIV transmission through sexual risk behavior, free condoms should be provided for all IDUs.

**KEY WORDS: HIV/IDUs/HIGHER RISK SEX/CONDOM/VIETNAM****58 pages**

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## LIST OF ABBREVIATIONS

|        |                                                   |
|--------|---------------------------------------------------|
| AIDS   | Acquired Immune Deficiency Syndrome               |
| FHI    | Family Health International                       |
| HIV    | Human Immunodeficiency Virus                      |
| IATT   | Inter-Agency Task Team                            |
| IBBS   | Integrated Biological and Behavioral Surveillance |
| IDU    | Injecting Drug Users                              |
| MOH    | Ministry of Health                                |
| MOLISA | Ministry of Labour Invalids and Society Affairs   |
| PLWHA  | People living with HIV/AIDS                       |
| STI    | Sexually Transmitted Infection                    |
| UNAIDS | The United Nations Joint Program on HIV/AIDS      |
| VAAC   | Vietnam Administration of HIV/AIDS Control        |
| WB     | World Bank                                        |
| WHO    | World Health Organization                         |

## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Problem statement**

The number of people living with HIV/AIDS (PLWHA) worldwide continued to grow in 2008, reaching an estimated 33.4 million. The global epidemiological data for HIV indicates that the annual number of AIDS deaths has declined for the past five years from 2.2 million in 2004 to 2.0 million in 2008 as a result of the considerable increase in access to HIV treatment in recent years. In Asia, an estimated 4.7 million PLWHA including 350,000 people who are newly infected, and 330,000 AIDS-related deaths in 2008. The HIV epidemic has been concentrated in specific populations, namely injecting drug users (IDUs), sex workers and their clients, and men who have sex with men (MSM) for a long time. However, the epidemic in many parts of Asia is steadily expanding into lower-risk populations through transmission to their sexual partners of those most at risk (UNAIDS, 2009a).

Vietnam is located close to the Golden Triangle of Thailand, Myanmar, and Laos, where one the biggest centres for narcotics production in the world is located, and on the route for transporting illicit drugs to other regions (Hammett, 2006). As a result, illegal drugs are cheap and readily available in Vietnam, this is one reason for the increasing number of drug users. In spite of efforts of the government to regulate and control drugs, the volume of drugs users has increased over the last decade. A report from the Vietnam Ministry of Police (MOP) indicates that up to June, 2009, the number of reported drug users was 153,682 in the nation (MOP, 2009). Data from the Vietnam Ministry of Labour Invalids and Society Affairs (MOLISA) shows that most drug users are IDUs, in some provinces, the percentage of IDUs reached 90%. Additionally, drug abuse treatment includes detoxification, management of drug dependence, and prevention of relapse (MOLISA, 2007). Since drug abuse is a complex disorder with many complications, there are multiple treatment methods

needed. Unfortunately, drug relapse remains common because of repeated treatments are often requires a long time spent in the treatment program.

In Vietnam, according to the Vietnam Ministry of Health (MOH), the number of PLWHA is 160,019 people, in which 35,603 cases of AIDS, and 44,540 deaths due to AIDS. The rate of HIV infection is 187 HIV positive per 100,000 of the population. The HIV epidemic is mainly dominated by drug users, in which they are accounted for 50.6% of total number of PLWHA (MOH, 2010). The problem for IDUs in Vietnam is that HIV prevalence among them will still remain high at 30% in the period of 2007 to 2012 (MOH, 2009).

In response to the HIV epidemic, Vietnam's National HIV Strategy, the Law on HIV and Decree 108, purposely support harm reduction interventions to reduce the HIV transmission associated with high-risk behaviors. The harm reduction interventions include a Needle and Syringe Program, Condom Use Program, and opiate substitution therapy or Methadone Maintenance Therapy Program. In 1993, the activities of peer education, encouragement of condom use and behavior change communication (BCC) were firstly piloted in Dong Da district, Ha Noi city and District 1, Ho Chi Minh city (MOH, 2007b). So far, according to the Vietnam Administration of HIV/AIDS Control (VAAC), 382 districts of 60 provinces implemented Needle and Syringe Program, 363 districts of 57 provinces carried out Condom Use Program, and the Methadone Maintenance Therapy Program was piloted in Ho Chi Minh city, Hai Phong city, and Hanoi (VAAC, 2009). Health officers worked with peer educators, PLWHA support groups and local police to provide harm reduction services to IDUs and female sex workers. By the end of 2009, according to Vietnam's fourth report of United Nations General Assembly Special Session on HIV/AIDS (UNGASS), there were 4,585 peer educators who are former and current IDUs or female sex workers and 8,278 collaborators participating in the program (UNGASS, 2010). These peer educators are issued with identification cards to formalize activities in delivering commodities to clients of harm reduction interventions.

The harm reduction interventions in Vietnam have been received international funding from donors such as the United States President's Emergency Plan for AIDS Relief (PEPFAR), the Department for International Development of the

United Kingdom (DFID), and the World Bank (WB). The Preventing HIV in Vietnam Project (PHP) implemented in 21/63 provinces and funded by DFID and the Norwegian Agency for Development Cooperation in 2003. The PHP is the first and largest harm reduction project in Viet Nam. The prioritized activities of the PHP are information, education, communication (IEC) and BCC, condom distribution, syringe distribution, STI management and treatment.

## **1.2 Problem justification**

According to the 2009 World Drug Report of the United Nations Office on Drugs and Crime (UNODC), recent stabilization in the world drugs market is under threat making 0.6 per cent of the planet's adult population to be classified as drug users. The situation of drug use in developing countries threatens to undermine recent progress in drug control (UNODC, 2009). In Asia, IDUs have the highest HIV prevalence of any population, most of them are living in low and middle-income countries, and the HIV prevalence among IDUs in this region is 16%. The countries with high HIV prevalence among drug users are the Islamic Republic of Iran with 67%, Indonesia 52%, and Thailand 30–50% (UNAIDS, 2009a).

The HIV prevalence among drug users is high in some Asian countries because of their risk behavior including syringe sharing, and unprotected sexual activities. In Pakistan, two thirds of IDUs reported syringe sharing (Bokhari, et al., 2007), in Shanghai (China), IDUs share syringe accounting for 26% (Zhao, et al., 2006). HIV is not only transmitted through syringe sharing, it is also transmitted through unsafe sex, and IDUs may be infected or transmit HIV through their unprotected sex. In addition, some IDUs need money to buy drugs, so they will engage in commercial sex. There is a significant proportion of drug users who are married or have many sex partners. However, perception of using condoms may cause a lack of trust in their partners, so they usually practice unprotected sex. This is the main route of HIV transmission from IDUs to the general community. Actually, many women become infected with HIV from their husbands who are HIV-positive IDUs (Anh, et al., 2008). A study among 400 wives or regular sexual partners of male IDUs in Chennai, Indian finds that these women are high risk of HIV infection (10.3%) due to

their husbands' behaviors, while 75% them reported never using condoms with their husbands (Solomon, Mehta, Latimore, Srikrishnan, & Celentano, 2010).

A survey in Hanoi, Vietnam among sex partners of IDUs found that 69% of them live in an unknown HIV status of IDUs, and yet only 17% of them reported consistent condom use (UNGASS, 2010). Another survey of 2,600 PLWHA conducted in 22 provinces in Vietnam found that 21% of PLWHA had a primary sexual partner with either negative or unknown HIV status, and 25% of those PLWHA reported that they never or used condoms inconsistently (Oanh, 2009). These lead to high HIV prevalence among IDUs, for example, data of the Vietnam Integrated Biological and Behavioral Surveillance Survey (IBBS) in 2006 shows that HIV prevalence is quite high, in Hai Phong 65% and 55% in Quang Ninh (IBBS, 2006).

People in a high economic situation have more liberalization in personal and social relationships including sexual ones, so they easily engage in premarital sex, cohabitate and have extramarital relationships (Ghuman, Loi, Huy, & Knodel, 2006). In Vietnam, the national socio-economic has been changing in recent years and is an opportunity for many people to liberalize their sexual relationships. The changing pattern of sexual relationships and the number of drug abusers is increasing, and a cause for concern in regards to IDUs and HIV transmission among them, and from this group to the population at large. For that reason, information regarding sexual risk behavior among IDUs in Vietnam is very necessary for an effective program in preventing HIV transmission the users to their sex partners including spouse, regular and irregular sex partners, and commercial sex workers.

### **1.3 Research question**

What are the factors affecting higher risk sex and inconsistent condom use, which are considered as sexual risk behavior of IDUs in Vietnam?

## **1.4 Research objectives**

### **1.4.1 Ultimate objective**

Findings of this study will provide the policy makers and program officers of government organizations, and non-government organizations with necessary information for effective harm reduction programs for IDUs.

### **1.4.2 Immediate objectives**

- 1) To describe knowledge of HIV, STI, perception of risk toward HIV infection, and sexual risk behavior of IDUs;
- 2) To study the factors affecting sexual risk behavior among IDUs.

## **CHAPTER II**

### **LITERATURE REVIEW**

This Chapter is divided into four parts aiming to review the theories related to behavior change as well as findings of the previous studies about factors effecting sexual behavior of IDUs. Then, the hypothesis and conceptual framework on sexual risk behavior are formulated based on this review.

#### **2.1 Theories regarding behavior change**

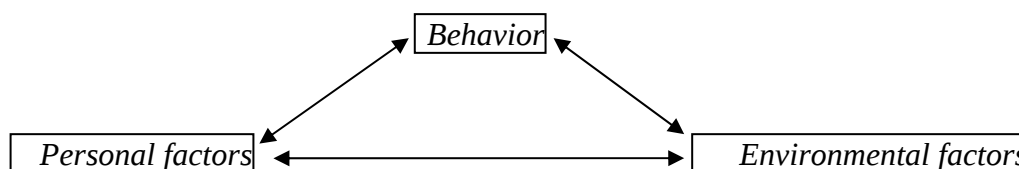
Behavior change is the adoption and maintenance of healthy behavior. It is the result of interaction of physical and socio-cultural environments. Analyzing complex health behaviors such as sexual ones, the socio-economic and cultural factors surrounding the individual must be considered (King, 1999). Behavior both affects, and is affected by, multiple levels of influence and it also shapes, and is shaped by the social environment (Croyle, 2005). The levels of influence include intra-personal or individual level, interpersonal level, and those of community. The intra-personal factors or individual characteristics include knowledge, attitudes, beliefs, motivation, self-concept, developmental history, past experience, and skills. The interpersonal factors comprise family, friends, and peers that provide social identity, support, and role definition. The institutional factors include rules, regulations, and policies, which may constrain or promote recommended behaviors. The community factors consist of social norms and standards, which exist among individuals, groups, and organizations (McLeroy, Bibeau, Steckler, & Glanz, 1988).

Many theories and models can be used to explain behavior changes. This study tends to review the Social Cognitive Theory and the Health Belief Model to explain the behavior change influenced by independent variables. The Social Cognitive Theory explains the personal and environmental factors that are effecting

behavior change. The Health Belief Model explains process in which the independent variables influence personal behavior.

### 2.1.1 Social Cognitive Theory:

The Social Cognitive Theory deals with cognitive, emotional aspects and behavior change. The theory officially launched by Bandura in 1986 in his book “Social Foundations of Thought and Action: A Social Cognitive Theory”. According to Croyle, the theory explains how people acquire and maintain certain behavioral patterns, while provides the basis for intervention strategies. The Social Cognitive Theory describes a dynamic, ongoing process in which personal factors, environmental factors, and human behavior exert influence upon each other. These three factors determine the likelihood that a person will change a health behavior related to self-efficacy, goals, and outcome expectancies. If individuals have a self-efficacy, they can change behaviors even when faced with obstacles. As a person adopts new behaviors, this causes changes in both the environment and in the person. People learn not only from their own experiences, but they also learn by observing the actions of others and the benefits of those actions.



The reciprocal causation of personal factors and individual behavior reflects the interaction between thought, affect, and action. Expectations, beliefs, perceptions, goals, and intentions give shape and direction to behavior. Their actions, in turn, partly determine their thought patterns and emotional reactions.

The reciprocal causation of environmental factors and personal ones are interactive relations between personal characteristics and environmental influences. Expectations, beliefs, perceptions, goals, and intentions are developed and modified by social influences. Different reactions of each individual with their social environment are defined by their physical characteristics, such as their age, size, race, sex, and physical attractiveness.

The reciprocal causation of behavior and environmental factors is the mutual influence between behavior and environmental circumstances. Social environment influences on individuals whether they like it or not. Even under the same effect of environment but the influence is deferent depending on how individuals behave. People are both products and producers of their environment (Croyle, 2005).

### **2.1.2 Health Belief Model:**

A summary of fours theories by FHI show that the Health Belief Model explains the individual's perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy). The model was developed in the 1950s by a group of psychologists in the United States and was furthered by Becker and colleagues in the 1970s and 1980s to explain why so few people were participating in programs to prevent and detect disease. The Health Belief Model has been adapted to explore a variety of long and short-term health behaviors, including sexual risk behaviors and the transmission of HIV/AIDS.

The central Health Belief Model construct is the perception or the 'perceived threat' of the diseases. The individual perceives the benefits of undertaking preventive health behaviors that encourages behavior change. The high cost of a procedure or lack of access to health care also is considered as barriers to behavior change. The cues to action is behavior change effected by the influence of information that the individual receives from the media, peers, physician, and family (FHI, 2002).

## **2.2 Previous studies related to sexual risk behavior of IDUs**

The HIV epidemic is driven by risk behaviors of IDUs in many countries including Vietnam. So far, many studies have been carried out for this group about their social-demographic characteristics, knowledge of HIV, STI, perception toward HIV infection, and their health status, as well as factors related to their drug use and sexual activities.

### **2.2.1 Social-demographic characteristics of IDUs**

#### **2.2.1.1 Age and sexual risk behavior:**

Most of IDUs are under 35 years old (Gu, et al., 2008; Gyarmathy & Neaigus, 2009; IBBS, 2006) and they often are active in sexual activities (Jarlais & Semaan, 2008). Age is associated with number of sex partners, compared with older males, the younger tend to have multiple sex partners (Jimenez & Lee, 2000). IDUs use drugs when they are very young, so the period of exposing sexual risk behavior will increase. A study (Choi, Cheung, & Chen, 2005) indicates that HIV infection vary at different ages, in which young male IDUs are predictive for having multiple sex partners and inconsistent condom use.

#### **2.2.1.2 Gender and sexual risk behavior:**

Women often face higher risk of HIV infection because of physiological, social, and cultural reasons so their risk of HIV infection during unprotected sex is two to four times higher than men (Lloyd, 2005). Double standards in culture and norms related to sexual behavior are barriers, in which doors are opened for men to explore sexuality from puberty, while closed for women who are not married (Aphichat, Sirinan, Chai, Isarabhakdi, & Sabaiying, 2007). Drug users mainly are male (Safi & Zafar, 2005) and more likely engage in sex risk behavior with casual partners than female (Cleland, Des Jarlais, Perlis, Stimson, & Poznyak, 2007). While some countries, the drug users who are female is rather high (Obot, Hubbard, & Anthony, 1999) and are mostly female sex workers (Sabbatini, Carulli, Villa, Correa Leite, & Nicolosi, 2001). The impact of gender norms that shapes the risk behavior of male and female IDUs are different, females are significantly more likely to have higher risk sex (Choi, et al., 2005). Lack of power and barriers of gender norms for females make it difficult to negotiate the use of condoms (Lloyd, 2005).

#### **2.2.1.3 Marital status and sexual risk behavior:**

Most of IDUs are young and single, so many of them cohabitate with their sex partners who are divorced or unmarried (Yao, et al., 2009). Even when IDUs get married they still expose their spouses to the risk of HIV infection as well. However, most of the married IDUs do not use condoms with their wives at all and the others used inconsistently. An in-depth interview of 23 IDUs by the Center for Research on Environmental Health and Population Activities (CREHPA) finds that the main

reasons for not using condom with regular partners or with spouse are associated with their perception that their girl friends did not have sexual relations with anybody else (CREHPA, 2004a). A study among 414 IDUs in Thanh Hoa province, Vietnam indicates that married IDUs are less likely to use condom consistently when having sex with commercial sex or irregular sex partners than those who are single. (Son, 2009)

#### 2.2.1.4 Education level and sexual risk behavior:

Education level of IDUs is generally very low (Safi & Zafar, 2005; Yao, et al., 2009). They had to drop school because of getting drug abuse when they were very young. Longer duration at school might reduce the numbers of partners because it is possible that young women at school are more likely to choose boyfriends within school. More highly educated girls and young women, they are more likely to be able to negotiate safer sex and reduce HIV rates. These women change their risk behavior including condom use because education can play a key role in enabling girls and women to process and apply messages that they hear about HIV/AIDS (Hargreaves & Boler, 2006).

#### 2.2.1.5 Employment status and sexual risk behavior:

Most of IDUs used the drugs when they were very young, and their education is low as mentioned above. Therefore, they often face difficulties in finding a job. Lack of money is a problem so they are more likely to engage in commercial sex for money, drugs, food or shelter (Becker, et al., 2004; Lau, et al., 2008). Among IDUs who reported being unemployed, they are more likely to engage in higher risk sex than those who are employed (Yao, et al., 2009). Results of a study about condom use among men in Kachanaburi find that unemployed men who have ever used condom is a little bit higher than for those who work in agricultural sectors (Chintana, 2007). However, another study found that unemployment is not significantly effect on consistent condom use (Wang, 2009). A study of IDUs in Bac Gaing province, Vietnam found that those who reported part-time employment or being unemployed were about half as likely to engage in higher risk sex or inconsistent condom use as those who reported full time employment or were self-employed (Schumacher, et al., 2009).

### **2.2.2 Knowledge of HIV, STI, and perception of HIV infection**

#### **2.2.2.1 Knowledge of HIV, STI and sexual risk behavior:**

Even the percentage of drug users who had heard of HIV is high but many of them had misconceptions about its transmission (Mathers, et al., 2009; Todd, et al., 2007) and their knowledge of STI is very low (Saleem, Adrien, & Razaque, 2008). Such misconception about HIV transmission causes individuals to practice higher risk sex by creating false awareness that they will be cured if they become infected (Nwokoji & Ajuwon, 2004; Tun, Celentano, Vlahov, & Strathdee, 2003).

People who lack HIV information will be easily engaged in sex without condoms (Kumar, Virk, Chaudhuri, Mittal, & Lewis, 2008). IDUs lack information about their sex partners and the HIV and STI situation, so they use condoms inconsistently (Friedman, Bolyard, Zenilman, Gelabert, & Sandoval, 2006). There is significant association between lack of awareness about HIV status of sex partners and less self-efficacy to use condoms, and negative condom beliefs are also found among IDUs (Purcell, et al., 2006).

#### **2.2.2.2 Perception of HIV infection and sexual behavior:**

Even IDUs have knowledge of HIV, but some of them still believe that they are not at risk of HIV infection (Yao, et al., 2009), so they easily engage in sexual risk behavior. Among HIV-positive IDUs, poor perception of HIV transmissibility through having unprotected sex is significantly associated with higher risk sex (Tun, et al., 2003).

IDUs who perceive themselves to be highly vulnerable to HIV infection from unprotected sex and know that their sex partners are casual sex partners, they will consistently use condoms to protect themselves from HIV (Houlding & Davidson, 2003). Their low perception of risk to HIV infection is significantly associated with history of drug use (Essien, et al., 2008). Another study indicates that safe sexual behavior is more likely to occur where the participants have high safe-sex attitude scores (Gyarmathy & Neaigus, 2009). People perceived themselves to be at high risk of being infected with HIV from a casual partner, were highly confident in their ability to use condoms and were highly confident in the ability of condoms to protect from HIV infection (Houlding & Davidson, 2003). A study among 216 female commercial sex workers in Quang Ninh province, Vietnam indicates that perceived susceptibility

to HIV infection was significantly related to consistent condom use. Who thought they were at risk to get HIV infection were 4.4 times more likely to consistently use condoms than those who thought they were not at risk of HIV infection. (Tam, 2004)

### **2.2.3 Drug use behavior**

IDUs are often thought to have high risk in regards to syringe sharing while ignored the sexual risk behavior. Actually, the links between drug use and sexual transmission of HIV are getting stronger through, pleasure-enhancing drugs that can lead to unsafe sex behavior (UNAIDS, 2009b). In addition, most drug users are young and active in sexuality, so drug use makes them unable to control their behavior completely, including sexual behavior. A study in Bac Giang province, Vietnam in 2008 among 216 sexually active male IDUs indicates that one third of them had engaged in higher risk sex, and IDUs who have ever shared syringes are more likely to be involved in higher risk sex (Schumacher, et al., 2009). Another study of 4,266 PLWHA in 20 provinces find that multi sex partner is significantly associated with sharing injection equipment and lower consistent condom use (Thanh, et al., 2009).

One of the reasons for IDUs preferring to have sexual intercourse after injecting is because of their belief that the sexual act will last longer (CREHPA, 2004b). There is abundant evidence that indicates the association between risk behavior of heroin injection, syringe sharing and sexual risk behavior (Hussey, et al., 2007; Li, Goggins, & Lee, 2009), in which, unprotected sex is more likely to occur when IDUs share syringe (Gyarmathy & Neaigus, 2009; Schumacher, et al., 2009; Tun, et al., 2003).

### **2.2.4 Accessibility to safe sex information and free condoms**

Accessibility to safe sex information and free condom distribution to IDUs is often encouraged to consider and suggests achievable methods of avoiding sexual risk behavior, for example, using condoms and reducing the number of sex partners. Receiving free condoms from the HIV/AIDS prevention program increases the probability of consistent condom use when having sexual intercourse with female sex workers or irregular sex partners (Son, 2009). Similarly, a study among 326 IDUs in

Ky Son, Nghe An province, Vietnam indicates that IDUs who received free condoms are more likely use the condom than others who did not. (Huong, 2008)

### **2.3 Research hypothesis**

- IDUs who can access free condom distribution, safe sex information, and have high knowledge of HIV and STI are less likely to engage in sexual risk behavior.
- IDUs who share syringes are more likely to engage in sexual risk behavior.

### **2.4 Conceptual framework**

The conceptual framework is established based on review of previous studies above, and Social Cognitive Theory to construct variables and the relationship of variables considered as independent and dependent variables. Independent variables include the social-demographic characteristics, knowledge of HIV, STI, perception of HIV infection and drug use behavior are considered as the personal factors of Social Cognitive Theory. Receiving safe sex information and receiving free condom are considered as environmental factors of this theory.

Two dependent variables, namely higher risk sex and inconsistent condom use are considered as sexual risk a behavior, which is observed behavior influenced by personal and environmental factors.

The first dependent variable is higher risk sex. It means that IDUs have sexual intercourse with irregular sex partners or commercial sex workers, not including their spouses or regular sex partners in the last twelve months.

The second dependent variable is inconsistent condom use. In the context of HIV prevalence still being high amongst IDUs, it makes sex partners of IDUs including their spouse or regular sex partner being risk of HIV infection. For this reason, both consistent condom use in higher risk sex and having sexual intercourse with their spouses or regular sex partners should be considered. For this study, inconsistent condom use means that IDUs do not always use condom at any sexual intercourse, both with spouse, regular or irregular sex partner, and commercial sex worker in the last twelve months.

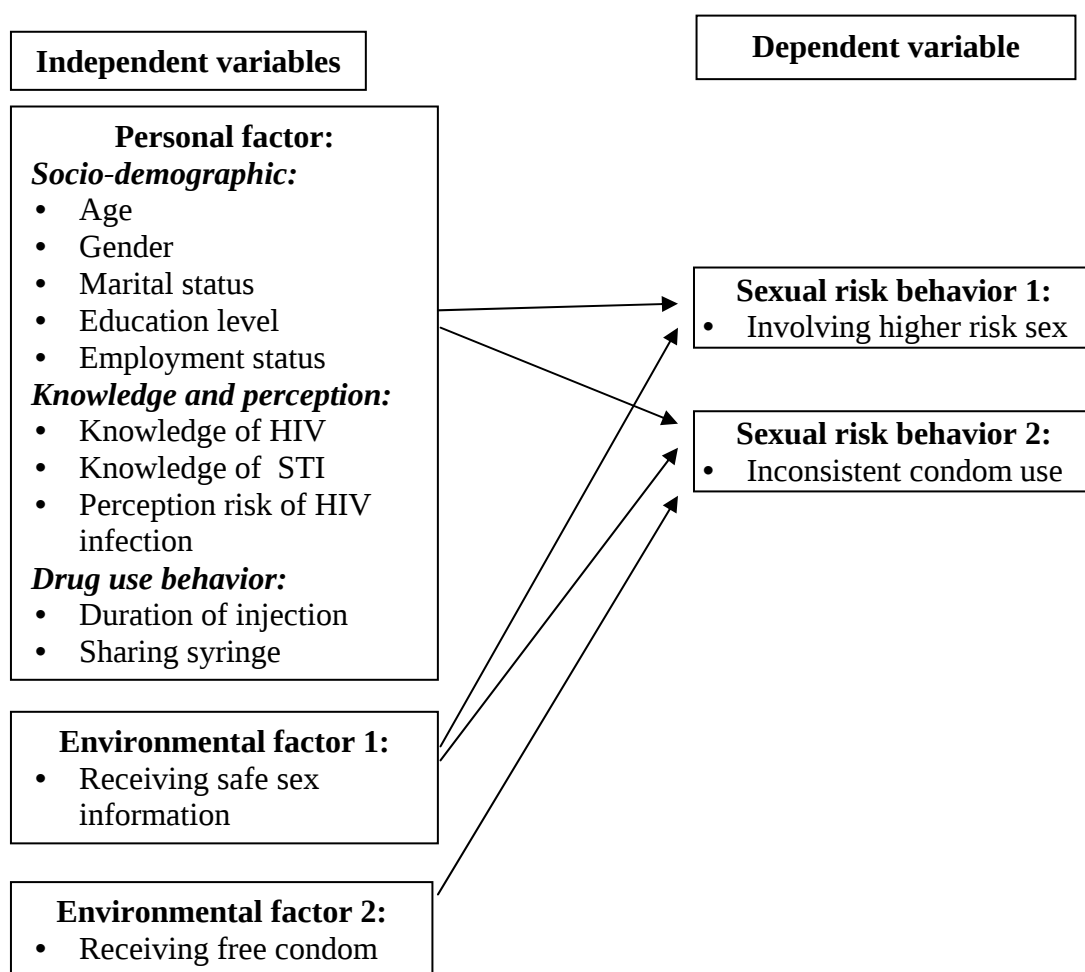


Figure 2-1: Conceptual framework on sexual risk behavior of IDUs

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

This study is quantitative research using secondary data of IDUs, which was withdrawn from a survey conducted in between November 2008 to January 2009. This Chapter describes the research methodology including data source, sampling design and sample size, operational definition of variables, method of data analysis, ethical aspects, and limitations of the study.

#### **3.1 Data source**

This study used secondary data from the survey entitled “Final evaluation of Preventing HIV Project in Vietnam”. The project was implemented in 21 provinces of Vietnam in the period 2004 – 2009, and funded by the DFID. The survey was conducted in seven provinces/cities including; Hanoi, Quang Ninh, Hai Phong, Da Nang, Ho Chi Minh, An Giang, and Can Tho between November 2008 to January 2009, by the management board of the aforementioned Ministry of Health project. The objectives of this survey are:

- Evaluating the effects of information, education, and communication about HIV/AIDS for target groups including; female sex workers, IDUs, and clients of female sex workers;
- Evaluating the availability and accessibility of sterile syringes and condoms, distributed to female sex workers and IDUs;
- Evaluating the results of peer education activities;
- Evaluating the results of STI prevention that are integrated with HIV prevention initiatives.

### **3.2 Research instrument**

A structured questionnaire was used for collecting the data including information about social-demographic characteristics, knowledge of HIV and STI, drug injection and sexual behavior, perception of HIV infection, and accessibility to harm reduction programs for IDUs. Only relevant questions on socio-demographic characteristics of IDUs; knowledge of HIV, STI; accessibility safe sex information and free condom from the harm reduction program; drug use and sexual behavior are selected for the analysis in this study.

### **3.3 Sampling design and size**

The respondents for the survey were 644 IDUs who lived in the selected districts of the seven chosen provinces, due to the high prevalence of IDUs. There were three selected districts in each province as there were more IDUs in each compared to other districts in that province. The stakeholders and peer educators listed all IDUs who lived in the selected districts at the time of survey. The respondents were randomly selected based on these lists of IDUs. The respondents were individually interviewed and interviewers recorded all information in the questionnaires.

Specifically, the sample for this study was limited to only 587 IDUs who have had sexual intercourse in the last 12 months.

### **3.4 Operational definition of variables**

#### **3.4.1 Independent variables**

##### **3.4.1.1 Personal factors of IDUs:**

- Age refers to number of years up to their last birthday in the year of the survey. The age is classified into 4 age groups; 15-24 years old, 25-34, 35-44, and over 44 years old.
- Gender is classified into 2 categories including male IDUs and female IDUs.

- Marital status refers to the current marital status of IDUs, which are classified into 3 categories; single status means that IDUs have never married; married; and other status includes who were divorced, separated, and widowed.

- Level of education refers to the highest level of education that IDUs completed, which is classified into 3 categories; primary school or lower, secondary school, and high school or higher.

- Employment status is classified into 2 categories; employed and unemployed. Employed status refers to IDUs who are working at paid-employment or are self-employed. Unemployed status is the situation that the person is seeking work.

- Knowledge of HIV refers to awareness of IDUs about the way HIV is transmitted, preventive methods to reduce the risk of HIV infection, and avoiding misunderstandings of the way HIV is transmitted. Knowledge of HIV is constructed by summing up the scores, number of right and wrong answers, of nine survey questions. Each answer, a zero score was given for incorrect answer and one score for correct. Therefore, the lowest score is zero and the highest is nine. The nine questions and correct answers for evaluating knowledge of HIV are:

Question 1: What are the ways of HIV transmission from a person who is HIV positive to others? The respondents must provide all three ways of HIV transmission. Three ways of HIV transmissions are: 1) HIV is transmitted through contacting with blood, which is contaminated with HIV; 2) HIV is transmitted through having unsafe sexual intercourse; 3) HIV is transmitted through women who are HIV positive to their children;

Question 2: Is being faithful able to reduce risk of HIV infection? The right answer is “Agree”.

Question 3: Can a person become infected with HIV if they share a toilet with someone who is HIV-positive? The right answer is “Disagree”.

Question 4: Do you think correct condom use can prevent HIV transmission from vaginal sexual intercourse? The right answer is “Agree”

Question 5: Do you think HIV can be transmitted through mosquito or insect biting? The right answer is “Disagree”.

Question 6: Do you think sharing a syringe can increase the risk of HIV infection? The right answer is “Agree”.

Question 7: Do you think cleaning a contaminated syringe with water can reduce risk of HIV infection? The right answer is “Disagree”.

Question 8: Do you think abstinence from sex can prevent HIV infection? The right answer is “Agree”.

Question 9: How do you know a person who is HIV positive? The right answer is “Only by HIV testing”.

- Knowledge of STI refers to IDUs who are able to list the six main signs and symptoms of STI including: 1) Lower abdomen pain; 2) Urethral/Vaginal discharge; 3) Dysuria; 4) Genital pain; 5) Genital ulcer; and 6) Genital itch. With each selection of these signs and symptoms listed, IDUs will get one score. Knowledge of STI is constructed by summing up total number of signs and symptoms of STI that are listed by IDUs. Therefore, the lowest score is zero and the highest is six.

- Perceived susceptibility to HIV infection refers to the respondent’s opinion of their risk to HIV infection. Perceived susceptibility to HIV infection is classified into two categories; perceiving the risk of HIV infection and not perceiving the risk of HIV infection.

- Duration of drug injection refers to the number of years that the respondent has been injecting drugs. It is counted from the first injection up to the time of survey. It is classified as less than 5 years, 5-9 years, 10-14 years, and over 14 year of drug injection.

- Syringe sharing refers to IDUs who have ever shared a syringe or equipment for mixing drugs in the last six months.

#### 3.4.1.2 Environmental factors:

- Receiving safe sex information refers to IDUs who have ever received any safe sex information from peer educators in the last six months.

- Receiving free condom refers to IDUs who have ever received a free condom in the last six months.

#### 3.4.2 Dependent variables:

There are two dependent variables considered as sexual risk behavior including higher risk sex and inconsistent condom use.

**Table 3-1. Operational definition of variables**

| <b>Variables</b>                |                                  | <b>Operational definition</b>                                                                                          | <b>Level of measurement</b> |
|---------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>I. Independent variables</b> |                                  |                                                                                                                        |                             |
| 1                               | Personal factors                 |                                                                                                                        |                             |
| 1.1                             | Socio-demographic                |                                                                                                                        |                             |
|                                 | Age                              | 15-24 years old = 1<br>25-34 years old = 2<br>35-44 years old = 3<br>>44 years old = 4                                 | <i>Ordinal</i>              |
|                                 | Gender                           | Male IDUs = 1<br>Female IDUs = 0                                                                                       | <i>Nominal</i>              |
|                                 | Marital status                   | Single = 1<br>Married = 2<br>Divorced, separated, and widowed = 3                                                      | <i>Nominal</i>              |
|                                 | Education level                  | Primary school or lower = 1<br>Secondary school = 2<br>Higher education = 3                                            | <i>Ordinal</i>              |
|                                 | Employed status                  | Employed = 1<br>Unemployed = 0                                                                                         | <i>Nominal</i>              |
| 1.2                             | Knowledge and perception         |                                                                                                                        |                             |
|                                 | Knowledge of HIV                 | There are 10 scales of score that range from 0 to 9                                                                    | <i>Interval</i>             |
|                                 | Knowledge of STI                 | There are 7 scales of score that range from 0 to 6                                                                     | <i>Interval</i>             |
|                                 | Perception risk of HIV infection | Perceive = 1<br>Do not perceive = 0                                                                                    | <i>Nominal</i>              |
| 1.3                             | Drug use behavior                |                                                                                                                        |                             |
|                                 | Duration of drug injection       | < 5 years of injection = 1<br>5-9 years of injection = 2<br>10-14 years of injection = 3<br>>14 years of injection = 4 | <i>Ordinal</i>              |
|                                 | Syringe sharing                  | Share syringe = 1<br>Do not share syringe = 0                                                                          | <i>Nominal</i>              |
| 2                               | Environmental factors:           |                                                                                                                        |                             |
|                                 | Receiving safe sex information   | Receive safe sex information = 1<br>Do not receive safe sex information = 0                                            | <i>Nominal</i>              |
|                                 | Receiving free condom            | Receive free condom = 1<br>Do not receive free condom = 0                                                              | <i>Nominal</i>              |
| <b>II. Dependent variables</b>  |                                  |                                                                                                                        |                             |
|                                 | Involving higher risk sex        | Involve higher risk sex = 1<br>Do not involve higher risk sex = 0                                                      | <i>Nominal</i>              |
|                                 | Inconsistent condom use          | Inconsistent condom use = 1<br>Consistent condom use = 0                                                               | <i>Nominal</i>              |

- Higher risk sex refers to IDUs who have ever had sexual intercourse with irregular sex partners or commercial sex workers in the last 12 months.
- Inconsistent condom use refers to IDUs who have sexual intercourse without always using condoms in the last 12 months. As mentioned above in Chapter II, inconsistent condom use means that IDUs have sexual intercourse without always using condoms at any sexual intercourse even with their spouses.

### **3.5 Data analysis**

Based on the objectives of the research, descriptive statistics with frequencies are presented to summarize the characteristics like socio-demographics, IDUs' knowledge of HIV, STI, drug use and sexual risk behavior as well as accessibility to the HIV/AIDS prevention program.

Binary logistic regression is used to determine whether independent variables in the models are statistically significant to predict the sexual risk behavior. The significant level at 0.05 is considered as statistical significant for this analysis. The odd ratio of logistic regression is estimated to measure the effect of predictors. By comparing the value of likelihood ratio (LR) chi square and Pseudo R square of the models with and without observed variables determines a set of variables to predict appropriately sexual risk behavior. Then simulation analysis to examine the magnitude effect of considered variable to predict sexual risk behavior is undertaken. In simulation analysis, keeping other variables being constant, predicts the probability of having or not having sexual risk behavior adjusted by effect of the predictor.

### **3.6 Ethical aspects**

The fields of this study are drug use and sexual behavior of IDUs, which are sensitive issue in the context of Vietnam. The respondents were provided an explanation about the contribution from their information. The respondents' name will not perform in the public. All respondents voluntarily participated in the survey.

Findings of this study contribute necessary information for HIV prevention program so it is of benefit for preventing HIV transmission among IDUs as well as from this group to communities in Vietnam.

Ethical approval from the Institutional Review Board of the Ethic Committee of Mahidol University is granted for this study. For that reasons, the results of this study will be confidently informed in the public.

### **3.7 Limitation of the study**

The data for this study is from a cross sectional survey. For that reason, it is difficult to explain the cause and effect between variables. Another limiting factor is the unavailable data on other factors that could not be collected in the survey may also affect the sexual risk behavior, With the sample from only 7 provinces, this study cannot be considered representative for the whole of IDUs in Vietnam.

Asking IDUs to list the six signs or syndromes of STIs to evaluate their knowledge, it maybe that those person with higher knowledge of STI obtained that knowledge due to their experience of STI. Of course, the IDUs who had experience of STI that means they engaged in sexual risk behavior.

## **CHAPTER IV**

### **RESULT AND DISCUSSION**

This Chapter presents the findings and discusses the results of data analyses of information from 587 IDUs in Vietnam. This chapter displays the main results of socio-demographic characteristics, knowledge of HIV and STI, perception toward HIV infection, drug use and sexual behavior, and accessibility to components of HIV/AIDS prevention program. Furthermore, this chapter describes the models to examine factors affecting sexual risk behavior among IDUs.

#### **4.1 Characteristics of IDUs**

##### **4.1.1 Socio-demographic characteristics of IDUs**

Table 4-1 describes the social-demographic characteristics of IDUs. The average age of the sample is 31 years old (the youngest: 17 and the oldest: 68; standard deviation: 8.3). The largest number of IDUs (49%) is within the age group 25-34 years old, followed by 22% between 34-44 years and 21% for the age group of 15-24 years.

In some cases, both male IDUs and their sex partners or their spouses are IDUs. This study did not study this issue, so the respondents were randomly selected based on the lists of IDUs made by peer educators. The majority (90%) of the sample for this study were male.

In Vietnam, children start going to primary school at 7 year of age, where they learn 5 years at primary level, 4 years at secondary level, and 3 years at high school. For this study, IDUs who completed secondary school were 46%, followed by the percentage of IDUs who completed their education at high school or higher level at 34%, and primary school or lower level at 20%.

More than half of IDUs have never married. The percentage of IDUs who are married or living with spouse is 38%, and IDUs who have ever married but are currently divorced, separated or widowed is 9%.

The percentage of IDUs who are under situation of unemployed is 35%.

**Table 4-1. Distribution of IDUs by socio-demographic characteristics**

| <b>Variables</b>                                   | <b>Frequencies</b> | <b>Percent</b> |
|----------------------------------------------------|--------------------|----------------|
| <b><i>Age group</i></b>                            |                    |                |
| 15-24 years                                        | 122                | 20.8           |
| 25-34 years                                        | 290                | 49.4           |
| 35-44 years                                        | 131                | 22.3           |
| >44 years                                          | 44                 | 7.5            |
| <i>Total</i>                                       | <i>587</i>         | <i>100.0</i>   |
| Mean = 31.2; Median = 30; SD = 8.3; Min=17; Max=68 |                    |                |
| <b><i>Gender</i></b>                               |                    |                |
| Male IDUs                                          | 526                | 89.6           |
| Female IDUs                                        | 61                 | 10.4           |
| <i>Total</i>                                       | <i>587</i>         | <i>100.0</i>   |
| <b><i>Education level</i></b>                      |                    |                |
| Primary school and lower                           | 120                | 20.4           |
| Secondary school                                   | 270                | 46.0           |
| High school and higher                             | 197                | 33.6           |
| <i>Total</i>                                       | <i>587</i>         | <i>100.0</i>   |
| <b><i>Marital status</i></b>                       |                    |                |
| Single                                             | 311                | 53.0           |
| Married                                            | 223                | 38.0           |
| Divorced, separated, and widowed                   | 53                 | 9.0            |
| <i>Total</i>                                       | <i>587</i>         | <i>100.0</i>   |
| <b><i>Employed status</i></b>                      |                    |                |
| Unemployed                                         | 205                | 34.9           |
| Employed                                           | 382                | 65.1           |
| <i>Total</i>                                       | <i>587</i>         | <i>100.0</i>   |

#### **4.1.2 Knowledge of HIV/STI, perception of HIV infection**

Table 4-2 shows the distribution of correct answers for each question to evaluate knowledge of HIV.

**Table 4-2. Distribution of correct answers for questions about knowledge of HIV**

| <b>Questions</b>                                                                                               | <b>Frequencies</b> | <b>Percent</b> |
|----------------------------------------------------------------------------------------------------------------|--------------------|----------------|
| <b><i>Which ways HIV is transmitted from a person who is HIV positive to other ones?</i></b>                   |                    |                |
| Incorrect                                                                                                      | 171                | 29.1           |
| Correct                                                                                                        | 416                | 70.9           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Is being faithful can reduce risk of HIV infection?</i></b>                                              |                    |                |
| Incorrect                                                                                                      | 26                 | 4.4            |
| Correct                                                                                                        | 561                | 95.6           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Is person infected HIV if they share toilet with some one who is HIV-positive?</i></b>                   |                    |                |
| Incorrect                                                                                                      | 47                 | 8.0            |
| Correct                                                                                                        | 540                | 92.0           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Do you think use condom correctly can prevent HIV transmission from virginal sexual intercourse?</i></b> |                    |                |
| Incorrect                                                                                                      | 7                  | 1.2            |
| Correct                                                                                                        | 580                | 98.8           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Do you think HIV can be transmitted through mosquito or insect biting?</i></b>                           |                    |                |
| Incorrect                                                                                                      | 75                 | 12.8           |
| Correct                                                                                                        | 512                | 87.2           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Do you think syringe sharing increase risk of HIV infection?</i></b>                                     |                    |                |
| Incorrect                                                                                                      | 14                 | 2.4            |
| Correct                                                                                                        | 573                | 97.6           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Do you think cleaning contaminated syringe by water can reduce risk of HIV infection?</i></b>            |                    |                |
| Incorrect                                                                                                      | 157                | 26.8           |
| Correct                                                                                                        | 430                | 73.3           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>Do you think abstinent from sexual intercourse can prevent HIV infection?</i></b>                        |                    |                |
| Incorrect                                                                                                      | 200                | 34.1           |
| Correct                                                                                                        | 387                | 65.9           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |
| <b><i>How do you know a person who is HIV positive?</i></b>                                                    |                    |                |
| Incorrect                                                                                                      | 198                | 33.7           |
| Correct                                                                                                        | 389                | 66.3           |
| <i>Total</i>                                                                                                   | <i>587</i>         | <i>100.0</i>   |

There are four questions, which more than ninety percent of IDUs who gave correct answer including “Is being faithful can reduce risk of HIV infection?”, “Is person infected HIV if they share toilet with some one who is HIV-positive?”, “Do you think use condom correctly can prevent HIV transmission from virginal sexual intercourse?”, and “Do you think syringe sharing increase risk of HIV infection?”. Ninety eight percent of IDUs had correct answer for question asked about syringe sharing will increase risk of HIV infection and IDUs who answered correctly question asked about cleaning contaminated syringe is 73%. Almost IDUs gave correct answers for questions asked about knowledge of HIV prevention related to sexual risk behavior. For questions about how being faithful can reduce the risk of HIV infection, 96% of IDUs provided the correct answer. The percentage of IDUs who have the correct answer for questions asked about using condoms correctly and their ability to prevent HIV transmission from vaginal sexual intercourse is 99%. Percentage of IDUs who have the correct answer for questions about abstinence, 66% understood that this method could prevent HIV infection.

Table 4-3 shows the distribution of knowledge scores of HIV, STI, and perceive risk of HIV infection. IDUs knowledge of HIV is rather high with an average score of 7.5, the lowest knowledge score possible is 0 and the highest being 9. Seventy seven percent of IDUs have a knowledge score of seven or higher than seven scores and 25% scored a nine.

Using the measure of respondent’s ability to list six main signs or symptoms of STI evaluates IDUs knowledge in regards to STI. The average knowledge score of STI is 1.9, the lowest knowledge score is 0 and the highest being 6. Most of the sampled IDUs have low knowledge scores of STI, in which nearly one third of IDUs could not list any signs or symptoms of STI.

Table 4-3 also indicates that sixty two percent of IDUs can realise themselves to be at high risk of HIV infection which considered as perceiving of susceptibility to HIV infection.

**Table 4-3. Distribution of knowledge score of HIV, STI, and perception of HIV infection**

| <b>Variables</b>                               | <b>Frequencies</b> | <b>Percent</b> |
|------------------------------------------------|--------------------|----------------|
| <b><i>Knowledge score of HIV</i></b>           |                    |                |
| 0 score                                        | 1                  | 0.2            |
| 3 scores                                       | 1                  | 0.2            |
| 4 scores                                       | 8                  | 1.4            |
| 5 scores                                       | 26                 | 4.4            |
| 6 scores                                       | 97                 | 16.5           |
| 7 scores                                       | 136                | 23.2           |
| 8 scores                                       | 173                | 29.5           |
| 9 scores                                       | 145                | 24.7           |
| <i>Total</i>                                   | <i>587</i>         | <i>100.0</i>   |
| Mean = 7.5; Median = 7; SD = 1.3; Min=0; Max=9 |                    |                |
| <b><i>Knowledge score of STI</i></b>           |                    |                |
| 0 score                                        | 190                | 32.4           |
| 1 scores                                       | 65                 | 11.1           |
| 2 scores                                       | 112                | 19.1           |
| 3 scores                                       | 124                | 21.1           |
| 4 scores                                       | 49                 | 8.4            |
| 5 scores                                       | 40                 | 6.8            |
| 6 scores                                       | 7                  | 1.2            |
| <i>Total</i>                                   | <i>587</i>         | <i>100.0</i>   |
| Mean = 1.9; Median = 1; SD = 1.7; Min=0; Max=6 |                    |                |
| <b><i>Perception risk of HIV infection</i></b> |                    |                |
| Do not perceive                                | 225                | 38.3           |
| Perceive                                       | 362                | 61.7           |
| <i>Total</i>                                   | <i>587</i>         | <i>100.0</i>   |

## 4.2 Receiving safe sex information and free condoms

Table 4-4 shows the distribution of receiving safe sex information and free condoms, which are the activities of harm reduction programs for IDUs. The percentage of IDUs who have ever received safe sex information in the last 6 months from peer educators is 67%. The percentage of IDUs who have ever received free condoms in the last 6 months is 73%, while IDUs who have not received free condoms for the duration of the last 6 months is 27%.

**Table 4-4. Distribution of receiving safe sex information and free condoms**

| <b>Variables</b>                             | <b>Frequencies</b> | <b>Percent</b> |
|----------------------------------------------|--------------------|----------------|
| <b><i>Receiving safe sex information</i></b> |                    |                |
| No                                           | 193                | 32.9           |
| Yes                                          | 394                | 67.1           |
| <i>Total</i>                                 | <i>587</i>         | <i>100.0</i>   |
| <b><i>Receiving free condoms</i></b>         |                    |                |
| No                                           | 160                | 27.3           |
| Yes                                          | 427                | 72.7           |
| <i>Total</i>                                 | <i>587</i>         | <i>100.0</i>   |

### 4.3 Risk behavior of IDUs

#### 4.3.1 Drug use behavior:

Table 4-5 provides the distribution of risk behavior amongst IDUs including their drug use behavior and sexual risk behavior.

This study considers the injection duration and syringe sharing as drug use behavior of IDUs. The average injection duration is 8 years, with the maximum years of injection being 45 years. Most of the IDUs (92%) have less than 15 years of injecting experience and 18% reported that they have ever shared a syringe in the last 6 months.

#### 4.3.2 Sexual risk behavior:

The distribution of higher risk sex and inconsistent condom use considered sexual risk behavior of IDUs is presented in the Table 4-5. With regard to higher risk sex, 79% of IDUs reported that they have ever had sexual intercourse with irregular sex partners or commercial sex workers in the last 12 months.

As the operational definition of inconsistent condom use mentioned in the previous chapter that IDUs have sexual intercourse without always using condoms at any sexual intercourse even with their spouses. This study finds that 28% of IDUs used condom inconsistently. Actually, some IDUs wished to have babies so they temporarily interrupted to use condom. The questionnaire could not give information to exclude these IDUs, so it is still counted as inconsistent condom use.

**Table 4-5. Distribution of risk behavior of IDUs**

| <b>Variables</b>                              | <b>Frequencies</b> | <b>Percent</b> |
|-----------------------------------------------|--------------------|----------------|
| <b><i>Duration of drug injection</i></b>      |                    |                |
| < 5 years                                     | 206                | 35.1           |
| 5-9 years                                     | 189                | 32.2           |
| 10-14 years                                   | 148                | 25.2           |
| >14 years                                     | 44                 | 7.5            |
| <i>Total</i>                                  | <i>587</i>         | <i>100.0</i>   |
| Mean = 7.6; Median = 7; SD = 6; Min=0; Max=45 |                    |                |
| <b><i>Syringe sharing</i></b>                 |                    |                |
| Do not share                                  | 484                | 82.5           |
| Share                                         | 103                | 17.6           |
| <i>Total</i>                                  | <i>587</i>         | <i>100.0</i>   |
| <b><i>Higher risk sex</i></b>                 |                    |                |
| Do not involve                                | 122                | 20.8           |
| Involve                                       | 465                | 79.2           |
| <i>Total</i>                                  | <i>587</i>         | <i>100.0</i>   |
| <b><i>Condom use</i></b>                      |                    |                |
| Consistent                                    | 420                | 71.6           |
| Inconsistent                                  | 167                | 28.5           |
| <i>Total</i>                                  | <i>587</i>         | <i>100.0</i>   |

## 4.4 Factors effecting sexual risk behavior

### 4.4.1 Higher risk sex

Table 4-6 demonstrates three models used to examine the influence of independent variables on higher risk sex.

Firstly, model 1A examines the influence of social-demographic characteristics, knowledge of HIV, STI, and perception of HIV infection on higher risk sex. Secondly, variables of drug use were added in model 2A to examine the influence of this factor on higher risk sex. Lastly, model 3A examines the effect of receiving safe sex information on higher risk sex.

In the model 1A only variables of age, education level, marital status, employed status, knowledge of HIV, STI, and perception of HIV infection together explain the variance of proportion of higher risk sex, and accounted for 8.6% ( $p < 0.001$ ). Variables have statistically significant effect on higher risk sex including marital status, knowledge of HIV, and knowledge STI.

**Table 4-6. Odd ratios of logistic regression for higher risk sex influenced by personal and environmental factors**

| <b>Variables</b>                      |                                           | <b>Model 1A</b> | <b>Model 2A</b> | <b>Model 3A</b> |
|---------------------------------------|-------------------------------------------|-----------------|-----------------|-----------------|
| <b>Age group</b>                      | 15-24 years <sup>(ref)</sup>              |                 |                 |                 |
|                                       | 25-34 years                               | 1.103           | 1.253           | 1.229           |
|                                       | 35-44 years                               | 1.154           | 1.365           | 1.323           |
|                                       | >44 years                                 | 0.873           | 0.950           | 0.955           |
| <b>Gender</b>                         | Female IDUs                               |                 |                 |                 |
|                                       | Male IDUs                                 | 1.850           | 2.028           | 2.002           |
| <b>Education level</b>                | Primary school and lower <sup>(ref)</sup> |                 |                 |                 |
|                                       | Secondary school                          | 0.644           | 0.720           | 0.709           |
|                                       | High school and higher                    | 0.549           | 0.574           | 0.574           |
| <b>Marital status</b>                 | Single <sup>(ref)</sup>                   |                 |                 |                 |
|                                       | Married                                   | 0.269***        | 0.268***        | 0.271***        |
|                                       | Divorced, separated, and widowed          | 0.763           | 0.747           | 0.734           |
| <b>Employment status</b>              | Unemployed                                |                 |                 |                 |
|                                       | Employed                                  | 1.083           | 1.105           | 1.114           |
| <b>Knowledge of HIV</b>               |                                           | 0.750**         | 0.765**         | 0.764**         |
| <b>Knowledge of STI</b>               |                                           | 1.171*          | 1.178*          | 1.168*          |
| <b>Perception of HIV infection</b>    | Do not perceive                           |                 |                 |                 |
|                                       | Perceive                                  | 1.181           | 1.014           | 1.008           |
| <b>Duration of drug injection</b>     | <5 years <sup>(ref)</sup>                 |                 |                 |                 |
|                                       | 5-9 years                                 |                 | 0.962           | 0.977           |
|                                       | 10-14 years                               |                 | 1.094           | 1.097           |
|                                       | >14 years                                 |                 | 1.236           | 1.266           |
| <b>Syringe sharing</b>                | Do not share                              |                 |                 |                 |
|                                       | Share                                     |                 | 4.695***        | 4.689***        |
| <b>Receiving safe sex information</b> | Do not receive information                |                 |                 |                 |
|                                       | Receive information                       |                 |                 | 1.279           |
| <b>LR chi square</b>                  |                                           | 51.410***       | 67.740***       | 68.870***       |
| <b>Pseudo R square</b>                |                                           | 0.086           | 0.113           | 0.115           |
| <b>Number of observation</b>          |                                           | 587             | 587             | 587             |

Note: \* significant level of 0.05; \*\*significant level of 0.01; and \*\*\*significant level of 0.001  
<sup>(ref)</sup>Reference group

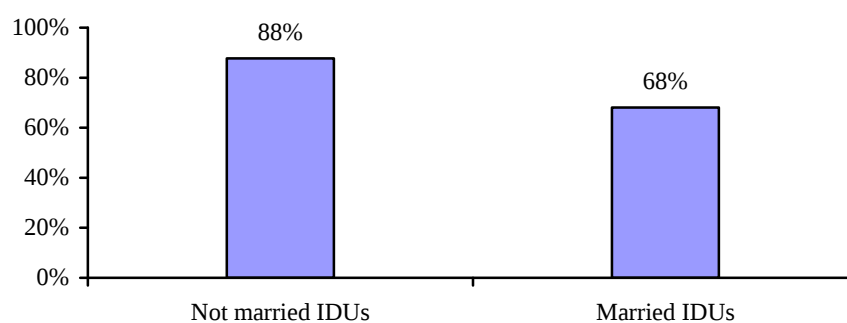
In the model 2A, variables of drug use behavior including duration of injection and syringe sharing are added, and this model predicts higher risk sex increases by 11.3% (p<0.001). The variables that have statistically significant effect on higher risk sex are marital status, knowledge of HIV, STI, and syringe sharing. The net

effect prediction of this model is 11.3% compared with 8.6% of model 1A, and is the effect of drug use behavior on higher risk sex.

In model 3A, the variable of receiving safe sex information from peer educator is added, this model predict the variance of the proportion of higher risk sex, which was 11.5% ( $p < 0.001$ ). The variable of receiving safe sex information from peer educators, which is added in the model 3A, but this factor is not statistically significant to predict higher risk sex. The variables are not statistically significant effect on higher risk sex including age of IDUs, gender, education level, employed status, perception risk of HIV infection, duration of drug injection, and receiving safe sex information from peer educators. The variables of personal factors that have statistically significant effect on higher risk sex are marital status, knowledge of HIV, STI, and syringe sharing, though the influence of each category of these variables may be different. Model 3A is used to interpret the effect of predictors on higher risk sex.

#### ***Marital status:***

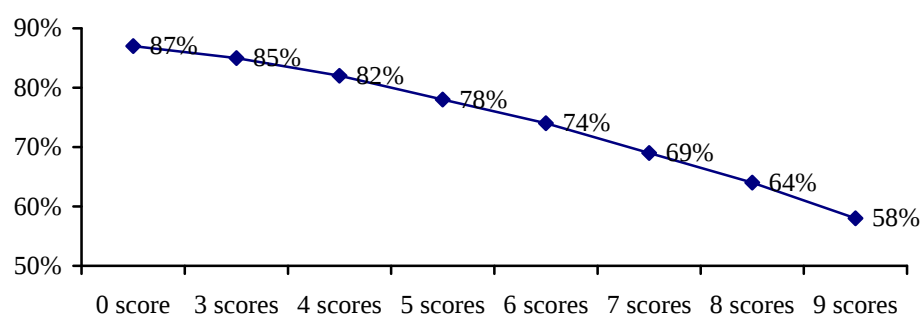
Model 3A in Table 4-6 shows that the married IDUs is 73% ( $p < 0.001$ ) less likely to be involved in higher risk sex compared to IDUs who have never married. Nevertheless, the category of IDUs who are divorced, separated, and widowed in relation to higher risk sex are not statistically significant. Results of simulation analysis shows that the probability of higher risk sex among IDUs who are married is 68%, while the probability of higher risk sex among IDUs who are not married is 88%, found in Figure 4-1.



**Figure 4-1. Simulated effect of marital status on higher risk sex**

***Knowledge of HIV:***

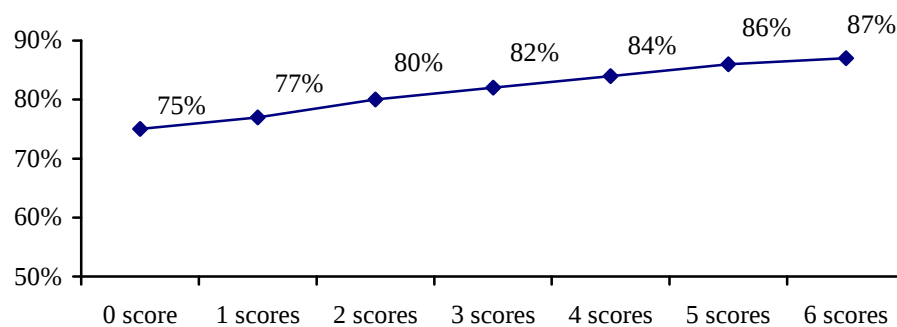
The knowledge of HIV has negative effect on higher risk sex. A knowledge score of HIV increase is associated with 24% decrease of the likelihood to be involved in higher risk sex ( $p < 0.01$ ). Results of simulation analysis show that the probability of higher risk sex among IDUs having a 0 score for knowledge of HIV is 87%, and it decreases for higher level scores, with the probability of those scoring 9 being 58%, as indicated in Figure 4-2.



**Figure 4-2. Simulated effect of knowledge score of HIV on higher risk sex**

***Knowledge of STI:***

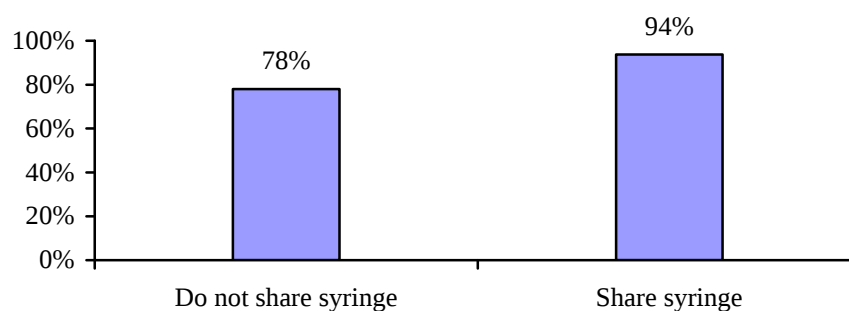
The knowledge of STI has positive effect on engaging in higher risk sex. An addition a score of knowledge of STI increases the odds of higher risk sex by 17% ( $p < 0.05$ ). Results of simulation analysis show that the probability of higher risk sex among IDUs having a 0 score for knowledge of STI is 75%, and it increases with higher level scores as indicated in Figure 4-3, with the probability of those scoring 6 being 87%.



**Figure 4-3. Simulated effect of knowledge score of STI on higher risk sex**

***Syringe sharing:***

Compared with IDUs who have not shared a syringe during the last 6 months, IDUs who have ever shared a syringe are more likely to be involved in higher risk sex by 4.7 times ( $p < 0.001$ ). Simulation analysis shown in Figure 4.4 indicates that the probability of higher risk sex among IDUs who share syringe is 94%, while the probability of higher risk sex among IDUs who do not share syringe is 78%.



**Figure 4-4. Simulated effect of syringe sharing on higher risk sex**

#### **4.4.2 Inconsistent condom use**

The table 4-7 demonstrates three models used to examine the influence of independent variables to inconsistent condom use among IDUs. Model 1B examines the influence of social-demographic characteristics, knowledge of HIV, STI, and perception of HIV infection on inconsistent condom use. Model 2B examines the influence of drug use behavior on inconsistent condom use, while model 3B examines the effect of receiving safe sex information and free condoms on inconsistent condom use.

In the model 1B only variables of age, education level, marital status, employment status, knowledge of HIV, STI together explain the variance of proportion of inconsistent condom use by 3.5% ( $p < 0.05$ ). Only variables of age and marital status have statistically significant effect on inconsistent condom use.

In the model 2B, variables of drug use behavior including duration of injection and syringe sharing is added, this model predicts the variance of proportion of inconsistent condom use by 4.9% ( $p < 0.01$ ). The variables have statistically significant effects on inconsistent condom in this model are marital status, and syringe

sharing. The net effect prediction for this model was 4.9% compared with 3.5% of model 1B, and is the effect of drug use behavior on inconsistent condom use.

**Table 4-7. Odd ratios of logistic regression for inconsistent condom use influenced by personal factors and environment factors**

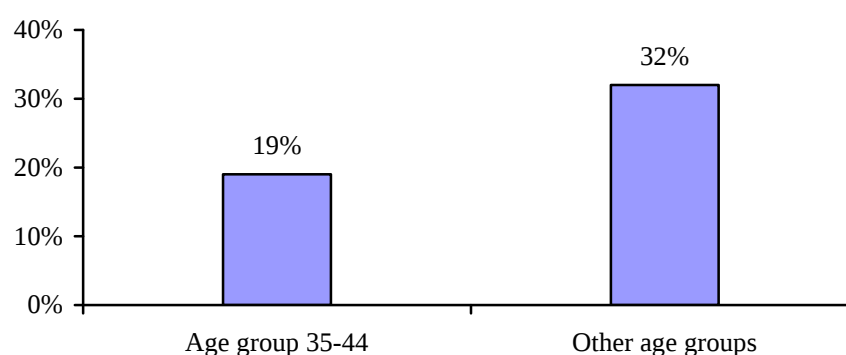
| <b>Variables</b>                      |                                           | <b>Model 1B</b> | <b>Model 2B</b> | <b>Model 3B</b> |
|---------------------------------------|-------------------------------------------|-----------------|-----------------|-----------------|
| <b>Age group</b>                      | 15-24 years <sup>(ref)</sup>              |                 |                 |                 |
|                                       | 25-34 years                               | 0.626           | 0.679           | 0.673           |
|                                       | 35-44 years                               | 0.426*          | 0.501           | 0.486*          |
|                                       | >44 years                                 | 0.883           | 1.121           | 1.060           |
| <b>Gender</b>                         | Female IDUs                               |                 |                 |                 |
|                                       | Male IDUs                                 | 1.071           | 1.196           | 1.183           |
| <b>Education level</b>                | Primary school and lower <sup>(ref)</sup> |                 |                 |                 |
|                                       | Secondary school                          | 1.162           | 1.237           | 1.224           |
|                                       | High school and higher                    | 1.402           | 1.497           | 1.479           |
| <b>Marital status</b>                 | Single <sup>(ref)</sup>                   |                 |                 |                 |
|                                       | Married                                   | 2.364***        | 2.606***        | 2.613***        |
|                                       | Divorced, separated, and widowed          | 1.341           | 1.469           | 1.518           |
| <b>Employment status</b>              | Unemployed                                |                 |                 |                 |
|                                       | Employed                                  | 1.043           | 1.043           | 1.054           |
| <b>Knowledge of HIV</b>               |                                           | 0.931           | 0.962           | 0.970           |
| <b>Knowledge of STI</b>               |                                           | 1.058           | 1.055           | 1.075           |
| <b>Perception of HIV infection</b>    | Do not perceive                           |                 |                 |                 |
|                                       | Perceive                                  | 0.940           | 0.867           | 0.884           |
| <b>Duration of drug injection</b>     | <5 years <sup>(ref)</sup>                 |                 |                 |                 |
|                                       | 5-9 years                                 |                 | 1.058           | 1.039           |
|                                       | 10-14 years                               |                 | 0.783           | 0.791           |
|                                       | >14 years                                 |                 | 0.702           | 0.719           |
| <b>Syringe sharing</b>                | Do not share                              |                 |                 |                 |
|                                       | Share                                     |                 | 2.033**         | 2.012**         |
| <b>Receiving safe sex information</b> | Do not receive information                |                 |                 |                 |
|                                       | Receive information                       |                 |                 | 0.902           |
| <b>Receiving free condom</b>          | Do not receive condom                     |                 |                 |                 |
|                                       | Receive condom                            |                 |                 | 0.642*          |
| <b>LR chi square</b>                  |                                           | 24.350*         | 34.540**        | 39.980**        |
| <b>Pseudo R square</b>                |                                           | 0.035           | 0.049           | 0.057           |
| <b>Number of observation</b>          |                                           | 587             | 587             | 587             |

Note: \* significant level of 0.05; \*\*significant level of 0.01; and \*\*\*significant level of 0.001  
<sup>(ref)</sup>Reference group

In model 3B, the variable of receiving safe sex information and receiving free condoms is added and the model predicts the variance of proportion of inconsistent condom use at 5.7% ( $p < 0.01$ ). The variables of personal factors that are not statistically significant effect in the model to predict inconsistent condom use including gender, education level, knowledge of HIV, STI, perception risk of HIV infection, and duration of drug injection. The variables that have statistically significant effect on inconsistent condom use are age group, marital status, syringe sharing, and receiving free condoms. The net effect prediction of this model is 5.7% compared with 4.9% of model 2B and is the effect of receiving safe sex information and free condom on inconsistent condom use. Model 3B is used to interpret the effect of predictors on inconsistent condom use.

#### ***Age group:***

IDUs who are in the age group 35-44 years are 51% ( $p < 0.05$ ) more likely use condoms consistently than IDUs who are within the age group 15-24 years. However, other age groups do not have statistical significant effects on inconsistent condom use. Results of simulation analysis, Figure 4-5 shows that the probability of inconsistent condom use among IDUs who are in the age group 35-44 is 19%, while the probability of inconsistent condom use of IDUs who are in other age groups is 32%.

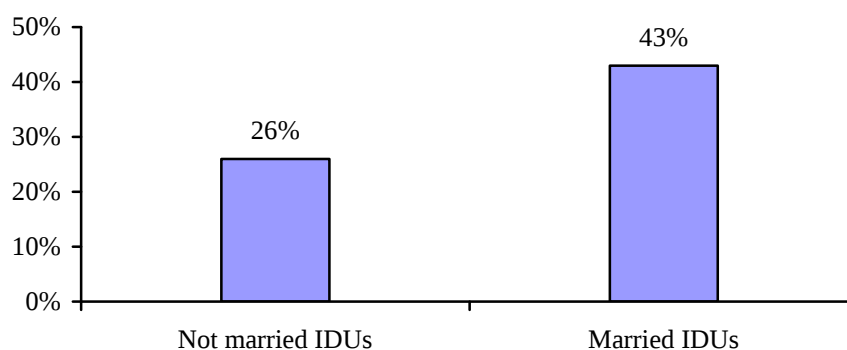


**Figure 4-5. Simulated effect age group 35-44 on inconsistent condom use**

#### ***Marital status:***

Compared with IDUs who have never married, IDUs who are married are more likely to use condoms inconsistently by 2.6 times ( $p < 0.001$ ). However, the

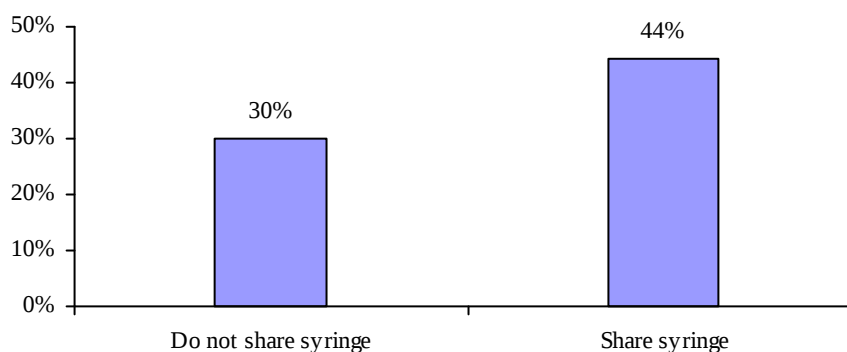
categories of IDUs who are divorced, separated, and widowed do not have a statistically significant effect to inconsistent condom use. The result of simulation analysis in Figure 4-6 shows that the probability of inconsistent condom use among IDUs who are married is 43%, while the probability of inconsistent condom use of IDUs who are not married is 26%.



**Figure 4-6. Simulated effect marital status on inconsistent condom use**

***Syringe sharing:***

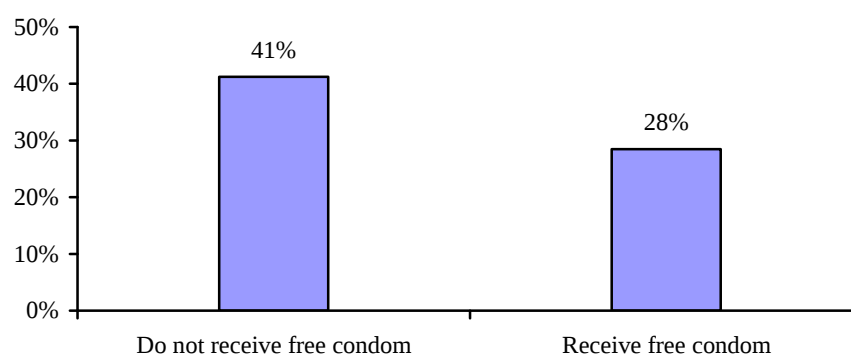
Compared with IDUs who did not share syringe during last 6 months, IDUs who have ever shared syringe are 2 times more likely to use condoms inconsistently ( $p < 0.01$ ). Results of the simulation analysis shows that the probability of inconsistent condom use among IDUs who share syringe is 44%, while the probability of inconsistent condom use among IDUs who do not share syringe is 30%, which is indicated in the Figure 4-7.



**Figure 4-7. Simulated effect syringe sharing on inconsistent condom use**

***Receiving free condom:***

IDUs who have ever received free condoms are 36% ( $p < 0.05$ ) more likely use condoms consistently than IDUs who did not receive free condoms during last 6 months. Results of simulation analysis, Figure 4-8, shows that the probability of inconsistent condom use among IDUs who receive free condoms is 28%, while the probability of inconsistent condom use among IDUs who do not receive free condoms is 41%.



**Figure 4-8. Simulated effect of receiving free condom on inconsistent condom use**

## **4.5 Discussion**

### **4.5.1 Characteristics of IDUs**

The average age of IDUs for this study is 31 years old indicates that is rather higher than the other studies in Thanh Hoa province (Son, 2009) and in Vinh Long province (Nghia, 2009), where the average age was 29 years. The reason for the average age of IDUs being rather higher is because the sample for this study was only IDUs who have had sexual intercourse in the last 12 months. For that reason, some young IDUs who have never had sex are excluded in this study making the average age of the sample increase. The percentage of IDUs at age 25-34 years old is 48%, which is similar to studies in Thanh Hoa province (Son, 2009) with 50% for this age group and in Bac Ninh province where 57% of them were younger than 28 years old (Schumacher, et al., 2009).

The majority are male which is in line with the findings of a study among 1519 IDUs in Ho Chi Minh city (Hien, et al., 2001). This study, the percentage of

female IDUs accounts for 10%, which is high in comparison with the situational review of drug use in Vietnam in the period of 1994 to 2004 by the Institute for Social Development Studies (ISDS). In this review the percentage of female IDUs was 4% (ISDS, 2009). This indicates that the percentage of female IDUs has tended to increase in recent years.

In this study, IDUs who completed secondary school or 9 years of education is 47% which is similar to others that found 48% (Nghia, 2009) and 49% (Huong, 2008; Son, 2009). A baseline survey in 4 provinces of Vietnam found that the percentage of IDUs who have a secondary school education level are 52% (Lai Chau), 30% (An Giang), 60% (Kien Giang), and 34% (Dong Thap) (Tuan, et al., 2002). Another study in some countries in Central Asia indicates that four fifths of drug users in Kazakhstan have education at the secondary level and two thirds of IDU found in Kyrgyzstan, Tajikistan, and Uzbekistan have attained this education level (Safi & Zafar, 2005). This indicates that education level of IDUs in Vietnam has not changed much over the years and remains at a low level compared with IDUs in some others countries of Central Asia.

Unemployed IDUs accounted for 35%, and is rather low compared with findings of studies among IDUs in Nghe An province at 44% (Huong, 2008) and similar with one third found in Bac Ninh province (Schumacher, et al., 2009). These results are rather similar compared with Pakistan, a country that has 147,000 estimated drug users in the year 2007 and unemployment at 30% (Bergengstrom, et al., 2010). The difference in their employment situation found in this study compared with others studies in some other provinces indicates that unemployment varies in different regions of Vietnam. A study in Delhi and Imphal, India also finds that unemployment is different when comparing male with female in various regions. The study found that in Delhi a majority of male IDUs are employed but almost all female IDUs are unemployed. In Imphal less than half of the male IDUs are employed and one third of female IDUs are unemployed (Sarna, et al., 2007).

Thirty eight percent of samples were married despite the fact that all the samples for this study are IDUs who had sexual intercourse within 12 months. Literature has provided percentages of IDUs who are married at 57% in Thanh Hoa province (Son, 2009), 30% in Nghe An province (Huong, 2008), and 26% in Vinh

Long province (Nghia, 2009). These variations indicate that marital status of IDUs varies in different provinces in recent years, and a large number of IDUs had experiences in extra marital sexual intercourse. This sexual behavior makes it easy for IDUs to easily engage in higher risk sex. The data of HIV prevalence surveillance in Guangxi province (China) and Hanoi capital city (Vietnam) indicated that there is correlation of HIV prevalence between IDUs and female sex worker (MAP, 2005).

#### **4.5.2 Factor effecting sexual risk behavior of IDUs**

##### **4.5.2.1 Age of IDUs**

This study find that only the age group 35-44 years old has a statistically significant effect on condom use, in which IDUs of this age group are 51% more likely use condoms consistently than IDUs who are within the age group 15-24. A study of 4,612 female regular sex partners of IDUs in Bangladesh, Bhutan, India, Nepal, and Sri Lanka also found that condom use at last sexual intercourse of respondents aged older than 28 years old is 1.5 times higher compared to those who are younger (Kumar, et al., 2008). As people become older, they have more knowledge, including knowledge of HIV, so they use condoms to prevent HIV infection. Conversely, for most of the young IDUs, their physical, emotional, and psychological state are not completely mature so they have less control over their bodies including inconsistent condom use. Additionally, young people engaging in HIV risk behavior are often unable to access the prevention and treatment services they need (IATT, 2007).

##### **4.5.2.2 Marital status**

This study finds that married IDUs are 73% less likely to to be involved in higher risk sex, but they are more likely to use condoms inconsistently by 2.6 times compared to IDUs who are single. For married persons as well as married IDUs, their spouses observe their sexual orientation, therefore they are not free to have sexual intercourse with any sex partner whenever they like. A study among 793 IDUs in Lima, Peru found that IDUs who are married are less likely involve themselves in higher risk sex by 4.4 times, but are 4.6 times more likely to use condoms inconsistently compared with IDUs who are single (Galvez, DeLea, Herrera, Gilman, & Paz, 2009). Also, results of some studies show that condom use when having sexual intercourse with regular sex partner or spouse is low. For example, a study among

4,612 sex partners of IDUs in five counties of the South Asian Association for Regional Cooperation, also found that those who have only one sex partner are unlikely to use condoms (Kumar, et al., 2008). Another study by the Saskatoon Health Region (SHR) found that a third of IDUs reported never using condoms with their regular sex partners (SHR, 2006). A study among 1,506 young aged 14-25 years old who have ever had sexual intercourse found that the percentage of condom use is different between single and married youth, in which 33.4% of singles used compared to 11.6% married youth who used condoms (Tien, 2006). In the context of Vietnam, condoms are generally used by couples as a family planning method for preventing unwanted pregnancy. However, the couple can choose one of several family planning methods including intra-uterine device (IUD), contraceptive pills and male or female sterilization. As a result, the percentage of couples choosing condoms as their method of family planning is only 32% (MOH, 2007a). This can be an additional reason for married IDUs being less likely to use a condom when they have sex with their spouse. There are probably multiple reasons why married couples are not likely to use condom, lack of skills in discussing/negotiating safer sex, perceived loss of erotic pleasure, and desire to have children despite risks of HIV transmission and STI.

#### 4.5.2.3 Knowledge of HIV and STI

IDUs' knowledge of HIV is rather high with an average of 7 scores ranged from 0 score to 9 scores, while their knowledge of STI is quite low with the average of 1.9 scores ranged from 0 score to 6 scores. Perceived risk of HIV infection is result formulated from knowledge of HIV. In this study, large numbers of IDU have high knowledge scores of HIV, but their perceived risk of HIV infection does not have a significant effect on sexual risk behavior of IDUs. History of drug use significantly decreases an individual's risk perception for HIV infection (Essien, et al., 2008).

Having knowledge of HIV, IDUs understand how HIV is transmitted including syringe sharing or injection equipment and the hazard of unprotected sex which helps reduce their number of sex partners or engaging in unprotected sex (Jarlais & Semaan, 2008). Analysis of the sample, finds that knowledge of HIV only has a positive influence for reducing higher risk sex but does not affect inconsistent condom use. The negative effect of knowledge of HIV on higher risk sex is explained by the large number of IDUs who can give correct answers for questions asked about

knowledge of HIV prevention through avoiding sexual risk behavior. These questions relating to being faithful can reduce risk of HIV, using condom correctly can prevent HIV transmission from vaginal sexual intercourse, and abstinence can prevent HIV infection.

Surprisingly, this study found that knowledge of STI has a positive effect on higher risk sex, in which IDUs who have higher knowledge of STI are more likely to engage in higher risk sex. This supports the ideas that many IDUs continue to have multi sex partners even if they have knowledge of STI. This was also found by a study among IDUs in Nepal, where most IDUs have some knowledge of HIV and STI as well as awareness of the proper preventive measures, but they still continue to engage in unsafe practices (CREHPA, 2004a).

#### 4.5.2.4 Drug use behavior

A study amongst 216 IDUs in Bac Ninh province, Vietnam found that both higher risk sex and inconsistent condom use are not associated with the duration of injection, but they are significantly associated with sharing a syringe, as found by (Schumacher, et al., 2009). This can be explained by the variation of influence on the duration of drug use on sexual desire. For new drug users who have used drugs for a short duration, findings indicate that they are very sexually active. During this period they felt more pleasure when having sex, with a stronger sexual desire and prolonged intercourse (ISDS, 2009). For the older and long-time users, they had lower sex needs because of erectile dysfunction, and less money (Nam, Detels, Hien, Long, & Nga, 2004).

Compared with IDUs who did not share syringe during last 6 months, IDUs who have ever shared syringe are more likely to be involved in higher risk sex by 4.7 times and are 2 times more likely to use condoms inconsistently. These are similar to the finding of IDUs who share syringes being more likely to report non-use of condoms than injecting drug users who do not share a syringe (Booth, 1995). A study in Bac Ninh province found that IDUs who shared syringe are more likely to engage in higher risk sex by 2.57 times than IDUs who did not share syringe (Schumacher, et al., 2009). The associated drug use behavior coupled with their sexual behavior makes it difficult to reduce IDUs sexual risk behavior (Paul, Stall, & Davis, 1993). According to an analysis by the Integrated Regional Information Networks

(IRIN), drug abuse leads people to undertake higher risk sex and inconsistent condom use (IRIN, 2007). Also their sex behavior may be affected by peer group influences, and HIV infection is influenced by the group with which they live so they tend to engage in similar behavior (Cui, Wang, Tan, Li, & Yang, 2009).

#### 4. 5.2.5 Receiving safe sex information and free condom

The percentage of IDUs who have ever received safe sex information in the last 6 months from peer educators was 67%. Peer education is an effective mechanism for increasing most at-risk young people's knowledge and skills about HIV and STI as well as behavior change contributing to enabling them to be responsible and protect themselves and others from HIV (IATT, 2007). However, this factor does not have significant effect in the binary logistic model to predict higher risk sex. The poor quality of safe sex information or frequency of receiving the information disseminated by peer educators, are not strong enough to make the influence on changing higher risk sex of IDUs. However, this study has insufficient information to evaluate the quality of safe sex information or frequency of receiving the information disseminated by peer educators.

The percentage of IDUs who have ever received free condom for the last 6 months is 73%. In the binary logistic model to predict consistent condom use, receiving free condom has a positive effect on consistent condom use, in which IDUs who have ever received free condoms are 36% more likely use condoms consistently than IDUs who did not receive free condoms. A study among IDUs in Thanh Hoa province, Vietnam found that odds of using condoms consistently among IDUs is higher when having sex intercourse with female sex workers compared with when having sex intercourse with their spouse (Son, 2009). In a cultural context for Vietnam, sexual issues are not to be discussed freely and most people feel ashamed when talking about sexual issues or buying a condom in public areas. These barriers are quite stronger among youth, especially those who are unmarried and young girls. Therefore, these groups do not want to buy condoms in pharmacy stores nearby their residence to avoid gossip among pharmacy owners' stores and their neighbours.

## **CHAPTER V**

### **CONCLUSION AND RECOMMENDATION**

The purpose of this chapter is to conclude the major finding of this study and to present recommendations for policy and program implementation an intervention for drug users as well as for further researches in correlation of sexual and drug use behavior among IDUs.

#### **5.1 Conclusion**

This study aims to describe knowledge of HIV, STI, perception of risk toward HIV infection, drug use, and sexual behavior among IDUs. A series of binary logistic models were used to examine the factors effecting sexual risk behavior among IDUs, with the dependent variables being higher risk sex and inconsistent condom use. The independent variables are age, gender, marital status, education level, employment status, knowledge of HIV and STI, perceived susceptibility to HIV infection, duration of drug injection, syringe sharing, receiving safe sex information from peer educators, and receiving free condoms.

The major findings of this study are IDUs in Vietnam have high knowledge of HIV with 77% of respondent able to give 7 correct answers from 9 questions asked about HIV, but their knowledge of STI is still low with more than one third of IDUs are unable to list any signs or syndrome of STI. IDUs are involved in higher risk sex at 79%, while inconsistent condom use is 28% within the last 12 months. Syringe sharing is significantly associated with sexual risk behavior, in which IDUs who have ever shared syringe in the last 6 months are 4.7 times ( $p<0.001$ ) more likely to get involved in higher risk sex, and are 2 times ( $p<0.01$ ) more likely to use condoms inconsistently. Married IDUs are 73% ( $p<0.001$ ) less likely to be involved in higher risk sex, but they are more likely to use condoms inconsistently by 2.6 times ( $p<0.001$ ) compared to IDUs who are single. IDUs who have high HIV knowledge

scores are less likely to engage in higher risk sex, were as those who have high STI knowledge scores are more likely to engage in higher risk sex. IDUs who are aged 35-44 years old as compared with those 15-24 years old, and who receive free condoms respectively are 51% ( $p < 0.05$ ) and 36% ( $p < 0.05$ ) more likely to use condoms consistently.

## **5.2 Recommendations for harm reduction program**

The results of this study raise concern of policy maker and program managers who are working in the field of prevention for drug users in Vietnam. The evidence of significant association of syringe sharing and sexual risk behavior found in this study advises that the strategy of HIV prevention for IDUs should include activities for reducing HIV transmission through syringe sharing and sexual risk behavior amongst IDUs.

Firstly, the number of IDUs who received safe sex information from peer educator is 67%, but their knowledge of STI is still low, which recommends that activities for information, education, and communication about STI should be improved. Therefore, training courses about sex education for peer educators on safe sex information should be scaled up in order to improve the quality of peer educators.

Secondly, the large number of IDUs involved in higher risk sex and use condoms inconsistently advises that behavior change communication to reduce the number of sexual partner, and consistent condom use is necessary for IDUs. Especially, married IDUs should be targeted to encourage them using condoms consistently and IDUs who are HIV positive should be made aware that they could infect their spouse.

Thirdly, syringe sharing is significantly associated with sexual risk behavior and advises that the Needle and Syringe Program in Vietnam should be expanded. With the expansion of the program, the number of IDUs who can access the program will increase. Programs should not only focus on reducing the number of IDUs syringe sharing, the program also promotes behavior change to prevent HIV transmission through the safe sexual risk behavior amongst IDUs.

Finally, the positive effective of knowledge of HIV on higher risk sex advises that information, education, and communication about HIV should continue to be disseminated. The current Condom Use Program in Vietnam, which focuses on distributing free condom to female sex workers, should be expanded to also distribute free condom to IDUs.

### **5.3 Recommendations for further researches**

Although many positive findings are found by this study, but it does not provide enough information to describe the real situation of sexual behavior, as well as the factors affecting the sexual behavior of IDUs in Vietnam. Further studies should be carried out for a greater understanding about their sexual risk behavior as following:

It is necessary to conduct research to understand reasons why IDUs have good knowledge of HIV, but their knowledge of STI is still low. In which, knowledge of STI should use multiple measures to evaluate knowledge, not only ask them to list the signs or syndromes of STI.

The studies about what kinds of safe sex information should propaganda for drug user, and which are the main sources of safe sex information disseminated for IDUs in order to increase knowledge about HIV transmission through sexual risk behavior. This will improve the quality of safe sex information to supply for IDUs.

Additionally, studies about sex behavior and drug use behavior that integrate biological tests including, HIV, Syphilis, and Hepatitis C, should be carried out to give more evidence of HIV transmission through sexual risk behavior among IDUs.

## BIBLIOGRAPHY

- Anh, N. T., Oosterhoff, P., Hardon, A., Tran, H. N., Coutinho, R. A., & Wright, P. (2008). A hidden HIV epidemic among women in Vietnam. *BMC Public Health*, 8, 37.
- Aphichat, C., Sirinan, K., Chai, P., Isarabhakdi, & Sabaiying, M. (2007). *National sexual behavior survey of Thailand 2006*. Nakhon Pathom: Institute for Population and Social Research, Mahidol University.
- Becker, B. M., Vlahov, D., Strathdee, S. A., Des Jarlais, D. C., Morse, E. V., Ouellet, L., et al. (2004). Association between injection practices and duration of injection among recently initiated injection drug users. *Drug Alcohol Depend*, 75(2), 177-183.
- Bergenstrom, A., Rehman, N., Fazil, Z., Qureshi, S. u. H., Zafar, T., & Saleem, M. (2010). Pakistan country advocacy brief Injecting Drug Use and HIV. Available from [http://www.unodc.org/documents/eastasiaandpacific/topics/hiv-aids/UNRTF/PAK\\_CAB\\_29\\_Mar\\_10\\_.pdf](http://www.unodc.org/documents/eastasiaandpacific/topics/hiv-aids/UNRTF/PAK_CAB_29_Mar_10_.pdf)
- Booth, R. E. (1995). Gender differences in high-risk sex behaviours among heterosexual drug injectors and crack smokers. *Am J Drug Alcohol Abuse*, 21(4), 419-432.
- Chintana, A. (2007). *Socio-demographic factors affecting condom use among men in Kachanaburi*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Choi, S. Y. P., Cheung, Y. W., & Chen, K. (2005). Gender and HIV risk behavior among intravenous drug users in Sichuan Province, China. *Soc Sci Med*, 62(7), 1672-1684.
- Cleland, C., Des Jarlais, D., Perlis, T., Stimson, G., & Poznyak, V. (2007). HIV risk behaviors among female IDUs in developing and transitional countries. *BMC Public Health*, 7(1), 271.

- CREHPA (2004a). *Injecting and sexual behaviors of Injecting Drug Users in Pokhara, Nepal*. Kathmandu: Center for Research on Environmental Health and Population Activities.
- CREHPA (2004b). *Injecting and sexual behaviour of Injecting Drug Users in Dharan, Nepal*. Lalitpur: Center for Research on Environmental Health and Population Activities.
- Croyle, R. T. (Ed.). (2005). *Theory at a glance*. Washington, DC: Division of Cancer Control and Population Sciences, National Cancer Institute.
- Cui, Q., Wang, J., Tan, J., Li, J., & Yang, K. (2009). *Exploring HIV/AIDS epidemic complex network of IDU using ABM and GIS*. Paper presented at the Proceedings of the 21st annual international conference on Chinese Control and Decision Conference.
- Essien, E. J., Ogungbade, G. O., Ward, D., Fernandez, E. M. E., Smith, C. R., & Holmes, L., Jr. (2008). Injecting drug use is associated with HIV risk perception among Mexican Americans in the Rio Grande Valley of South Texas, USA. *Public Health*, 122(4), 397-403.
- FHI (2002). Behavior change-A summary of four major theories. Available from <http://www.fhi.org/nr/rdonlyres/ei26vbslpsidmahhxc332vwo3g233xsqw22er3vofqvrjvubwyzclvqjcbdgexyzl3msu4mn6xv5j/bccsummaryfourmajortheories.pdf>
- Friedman, S. R., Bolyard, M., Zenilman, J., Gelabert, P. M., & Sandoval, M. (2006). *Non-injector sex partners of IDUs: Results from a sexual network study of infection*. Paper presented at the 134th annual meeting and exposition of the American Public Health Association. from [http://apha.confex.com/apha/134am/techprogram/paper\\_128302.htm](http://apha.confex.com/apha/134am/techprogram/paper_128302.htm)
- Galvez, B. J., DeLea, S., Herrera, P., Gilman, R., & Paz, S. V. (2009). Sexual behavior and drug consumption among young adults in a shantytown in Lima, Peru. *BMC Public Health*, 9(1), 23.
- Ghuman, S., Loi, V. M., Huy, V. T., & Knodel, J. (2006). Continuity and change in premarital sex in Vietnam. *Int Fam Plan Perspect*, 32(4), 166-174.
- Gu, J., Chen, H., Chen, X., Lau, J. T., Wang, R., Liu, C., et al. (2008). Severity of drug dependence, economic pressure and HIV-related risk behaviors among

- non-institutionalized female injecting drug users who are also sex workers in China. *Drug Alcohol Depend*, 97(3), 257-267.
- Gyarmathy, V. A., & Neaigus, A. (2009). The relationship of sexual dyad and personal network characteristics and individual attributes to unprotected sex among young Injecting Drug Users. *AIDS and Behavior*, 13(2), 196-206.
- Hammett, T. (2006). A promising cross-border HIV prevention project for Injection Drug Users. *Abstract*, 01(06). Retrieved from [http://www.abtassociates.com/newsletters/abtstractsv1\\_06.pdf](http://www.abtassociates.com/newsletters/abtstractsv1_06.pdf)
- Hargreaves, J., & Boler, T. (2006). The impact of girls' education on HIV and sexual behavior. Available from [http://data.unaids.org/publications/IRC-pub01/jc010-impactyoungpeople\\_en.pdf](http://data.unaids.org/publications/IRC-pub01/jc010-impactyoungpeople_en.pdf)
- Hien, N. T., Giang, L. T., Binh, P. N., Deville, W., van Ameijden, E. J., & Wolffers, I. (2001). Risk factors of HIV infection and needle sharing among injecting drug users in Ho Chi Minh City, Vietnam. *J Subst Abuse*, 13(1-2), 45-58.
- Houlding, C., & Davidson, R. (2003). Beliefs as predictors of condom use by injecting drug users in treatment. *Health Educ Res*, 18(2), 145-155.
- Huong, N. T. T. (2008). *Effects of HIV/AIDS prevention outreach activities on HIV/AIDS knowledge and risk behaviors of young male IDU in Ky Son, Nghe An, Vietnam*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Hussey, J. M., Hallfors, D. D., Waller, M. W., Iritani, B. J., Halpern, C. T., & Bauer, D. J. (2007). Sexual behavior and drug use among Asian and Latino adolescents: association with immigrant status. *J Immigr Minor Health*, 9(2), 85-94.
- IATT (2007). HIV intervention for most at risk young people. Available from <http://www.unfpa.org/hiv/iatt/docs/mostatrisk.pdf>
- IBBS (2006). *Integrated Biological and Behavioral Surveillance in Vietnam*. Hanoi: Ministry of Health.
- IRIN (2007). *Youth in crisis coming of age in the 21st century*. Nairobi, Kenya: Integrated Regional Information Networks.
- ISDS (2009). *Fact sheet on drug addiction and HIV*. Hanoi: Institute for Social Development Studies.

- Jarlais, D. C., & Semaan, S. (2008). HIV prevention for injecting drug users: the first 25 years and counting. *Psychosom Med*, 70(5), 606-611.
- Jimenez, P. R., & Lee, R. B. (2000). *Male sexual risk behavior and HIV/AIDS: A survey in three Philippine cities*. Manila: Behavioral Sciences Department, De La Salle University.
- King, R. (1999). Sexual behavioural change for HIV: Where have theories taken us?, UNAIDS/99.27E. Available from [http:// www.who.int/ hiv/ strategic/ surveillance/en/unaid99\\_27.pdf](http://www.who.int/hiv/strategic/surveillance/en/unaid99_27.pdf)
- Kumar, M. S., Virk, H. K., Chaudhuri, A., Mittal, A., & Lewis, G. (2008). A rapid situation and response assessment of the female regular sex partners of male drug users in South Asia: Factors associated with condom use during the last sexual intercourse. *International Journal of Drug Policy*, 19(2), 148-158.
- Lau, J. T., Zhang, L., Zhang, Y., Wang, N., Lau, M., Tsui, H. Y., et al. (2008). Changes in the prevalence of HIV-related behaviors and perceptions among 1832 injecting drug users in Sichuan, China. *Sex Transm Dis*, 35(4), 325-335.
- Li, H., Goggins, W., & Lee, S. (2009). Multilevel analysis of HIV related risk behaviors among heroin users in a low prevalence community. *BMC Public Health*, 9(1), 137.
- Lloyd, C. B. (Ed.). (2005). *Growing up global: The changing transitions to adulthood in developing countries*. Washington, DC: National Academy of Sciences.
- MAP (2005). Drug injection and HIV/AIDS in Asia. Available from [http://www.mapnetwork.org/docs/MAP\\_IDU%20Book%2024Jun05\\_en.pdf](http://www.mapnetwork.org/docs/MAP_IDU%20Book%2024Jun05_en.pdf)
- Mathers, B. M., Degenhardt, L., Adam, P., Toskin, I., Nashkoev, M., Lyerla, R., et al. (2009). Estimating the level of HIV prevention coverage, knowledge and protective behavior among injecting drug users: what does the 2008 UNGASS reporting round tell us? *J Acquir Immune Defic Syndr*, 52 Suppl 2, S132-142.
- McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health education quarterly*. 15(4), 351-377.

- MOH (2007a). *Health statistics year book 2007*. Hanoi: Planning and Finance Department, Ministry of Health.
- MOH (2007b). *National action plan on harm reduction in HIV intervention period 2007-2010*. Hanoi: Vietnam Administration of HIV/AIDS Control, Ministry of Health.
- MOH (2009). *Vietnam HIV/AIDS estimates and projections 2007-2012*. Hanoi: Ministry of Health.
- MOH (2010). The HIV epidemic in Vietnam 2009. Available from [http://www.vaac.gov.vn/Desktop.aspx/Noi-dung/Tinh-hinh-dich/Tinh\\_hinh\\_dich\\_nhiem\\_HIVAIDS\\_toan\\_quoc\\_nam\\_2009/](http://www.vaac.gov.vn/Desktop.aspx/Noi-dung/Tinh-hinh-dich/Tinh_hinh_dich_nhiem_HIVAIDS_toan_quoc_nam_2009/)
- MOLISA (2007). *The report of experience from some effectiveness models for drug abuse treatment period 2001-2006*. Hanoi: Ministry of Labour, Invalids and Social Affairs.
- MOP (2009). *The report in the meeting dated 22 July 2009 of National Committee for HIV/AIDS, Drugs and Prostitution Prevention and Control*. Hanoi: Ministry of Police.
- Nam, T. T., Detels, R., Hien, N. T., Long, H. T., & Nga, P. T. H. (2004). Drug use, sexual behaviours and practices among male drug users in Hanoi, Vietnam-a qualitative study. *International Journal of Drug Policy*, 15(3), 182-188.
- Nghia, K. V. (2009). *Environmental factors affecting risk behaviors for HIV infection among injecting drug users in Vinh Long province, Vietnam*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Nwokoji, U. A., & Ajuwon, A. J. (2004). Knowledge of AIDS and HIV risk-related sexual behavior among Nigerian naval personnel. *BMC Public Health*, 4, 24.
- Oanh, K. T. H. (2009). *Sexual and reproductive health needs of PLHIV in Vietnam*. Paper presented at the workshop on linkage between Reproductive Health and HIV services, 18-19 November 2009 in Hoa Binh province.

- Obot, I. S., Hubbard, S., & Anthony, J. C. (1999). Level of education and injecting drug use among African Americans. *Drug Alcohol Depend*, 55(1-2), 177-182.
- Paul, J. P., Stall, R., & Davis, F. (1993). Sexual risk for HIV transmission among gay/bisexual men in substance-abuse treatment. *AIDS Education and Prevention*, 5(1), 11-24.
- Purcell, D. W., Mizuno, Y., Metsch, L. R., Garfein, R., Tobin, K., Knight, K., et al. (2006). Unprotected sexual behavior among heterosexual HIV-positive injection drug using men: associations by partner type and partner serostatus. *J Urban Health*, 83(4), 656-668.
- Sabbatini, A., Carulli, B., Villa, M., Correa Leite, M. L., & Nicolosi, A. (2001). Recent trends in the HIV epidemic among injecting drug users in Northern Italy, 1993-1999. *AIDS*, 15(16), 2181-2185.
- Safi, N., & Zafar, M. (2005). Harm reduction strategy for Injecting Drug Use (IDU) and HIV/AIDS prevention in Afghanistan. Available from [http://www.ahrn.net/library\\_upload/uploadfile/file2495.pdf](http://www.ahrn.net/library_upload/uploadfile/file2495.pdf)
- Saleem, N. H., Adrien, A., & Razaque, A. (2008). *Risky sexual behavior, knowledge of sexually transmitted infections and treatment utilization among a vulnerable population in Rawalpindi, Pakistan* (Vol. 39).
- Sarna, A., Tun, W., Bhattacharya, A., Mahandra, V., Selhore, N., Singh, A., et al. (2007). Injecting drug users in Indian: understanding sexual behaviours and sexual networks to design effective behaviour change strategies. Retrieved from [www.popcouncil.org/pdfs/IndiaUpdate/IndiaUpdate\\_DrugUsers.pdf](http://www.popcouncil.org/pdfs/IndiaUpdate/IndiaUpdate_DrugUsers.pdf)
- Schumacher, C. M., Go, V. F., Van Nam, L., Latkin, C. A., Bergenstrom, A., Celentano, D. D., et al. (2009). Social injecting and other correlates of high-risk sexual activity among injecting drug users in northern Vietnam. *International Journal of Drug Policy*, 20(4), 352-356.
- SHR (2006). *Investigation of an HIV cluster among Injection Drug Users in Saskatoon, Saskatchewan*. Saskatchewan: Public Health Services, Healthy Lifestyles Department.

- Solomon, S., Mehta, S., Latimore, A., Srikrishnan, A., & Celentano, D. (2010). The impact of HIV and high-risk behaviours on the wives of married men who have sex with men and injection drug users: implications for HIV prevention. *Journal of the International AIDS Society*, 13(Suppl 2), S7.
- Son, V. H. (2009). *Risk behavior among Injecting Drug Users in Thanh Hoa province, Vietnam*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Tam, N. T. M. (2004). *Condom use related to HIV/AIDS prevention among female commercial sex workers in Quang Ninh province, Vietnam*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Thanh, D., Hien, N., Tuan, N., Thang, B., Long, N., & Fylkesnes, K. (2009). HIV Risk Behaviours and Determinants Among People Living with HIV/AIDS in Vietnam. *AIDS and Behavior*, 13(6), 1151-1159.
- Tien, T. M. (2006). *Impact of mass media expose on knowledge and use of contraceptive among Vietnamese adolescents and youth*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Todd, C., Abed, A., Strathdee, S., Scott, P., Botros, B., Safi, N., et al. (2007). Association between expatriation and HIV awareness and knowledge among injecting drug users in Kabul, Afghanistan: A cross-sectional comparison of former refugees to those remaining during conflict. *Conflict and Health*, 1(1), 5.
- Tuan, N. A., Thang, B. D., Hien, N. T., Long, N. T., Chi, P. K., Thang, P. H., et al. (2002). *Community Action for Preventing HIV/AIDS in Lai Chau, Quang Tri, Dong Thap, An Giang, and Kien Giang*. Hanoi: Community Action for Preventing HIV/AIDS Project.
- Tun, W., Celentano, D., Vlahov, D., & Strathdee, S. (2003). Attitudes toward HIV treatments influence unsafe sexual and injection practices among injecting drug users. *AIDS*, 17(13), 1953-1962.
- UNAIDS (2009a). AIDS epidemic update. Available from [http://data.unaids.org/pub/Report/2009/JC1700\\_Epi\\_Update\\_2009\\_en.pdf](http://data.unaids.org/pub/Report/2009/JC1700_Epi_Update_2009_en.pdf)

- UNAIDS (2009b). Asian economies in rapid transition: HIV now and through 2031. Available from [http://www.aids2031.org/pdfs/asian\\_economies\\_in\\_rapid\\_transition\\_hiv\\_now\\_and\\_through\\_2031%5B2%5D.pdf](http://www.aids2031.org/pdfs/asian_economies_in_rapid_transition_hiv_now_and_through_2031%5B2%5D.pdf)
- UNGASS (2010). *The fourth country progress report on following up the United Nations General Assembly Special Session*. from [http://data.unaids.org/pub/Report/2010/vietnam\\_2010\\_country\\_progress\\_report\\_en.pdf](http://data.unaids.org/pub/Report/2010/vietnam_2010_country_progress_report_en.pdf).
- UNODC (2009). Annual report 2009. Available from [http://www.unodc.org/documents/about-unodc/AR09\\_LORES.pdf](http://www.unodc.org/documents/about-unodc/AR09_LORES.pdf)
- VAAC (2009). *Report on HIV/AIDS Prevention and Control Programs in 2009*. from <http://www.vaac.gov.vn/Desktop.aspx/Noi-dung/Cac-bao-cai-hoat-dong/Bao-cai-cong-tac-phong-chong-HIVAIDS-nam-2009/>.
- Wang, D. (2009). *The impact of life changes on consistent condom use among Thai male youth, a study in Kachanaburi DSS, Thailand*. Master Thesis. Institute for Population and Social Research, Mahidol University, Nakhon Pathom.
- Yao, Y., Wang, N., Chu, J., Ding, G., Jin, X., Sun, Y., et al. (2009). Sexual behavior and risks for HIV infection and transmission among male injecting drug users in Yunnan, China. *International Journal of Infectious Diseases*, 13(2), 154-161.
- Zhao, M., Du, J., Lu, G. H., Wang, Q. Y., Xu, H., Zhu, M., et al. (2006). HIV sexual risk behaviors among injection drug users in Shanghai. *Drug Alcohol Depend*, 82 Suppl 1, S43-47.

## **APPENDICES**

## APENDIX A

### SELECTED QUESTIONS OF QUESTIONNAIRE

Code:.....

Province ..... ☐ District ..... ☐☐

Interview time: ☐☐/☐☐/2009

Interviewer: .....

Supervisor: .....

My name is....., program officer of the Project “Preventing HIV in Vietnam”. In order to evaluate individual knowledge of HIV, I would like you give some information as questions of this questionnaire. Your name is not mentioned in public. We hope that your information is very necessary for our endeavour improving knowledge of HIV of every ones. This interview may last for 30 minutes.

I would like to thanks for your cooperation!

| Code | Questions                              | Answer coding                                                                                   |
|------|----------------------------------------|-------------------------------------------------------------------------------------------------|
| I.   | General individual information         |                                                                                                 |
| C73  | Gender                                 | Male 1<br>Female 2                                                                              |
| C74  | How old are you?                       | <input type="checkbox"/> <input type="checkbox"/>                                               |
| C75  | Which is your highest education level? | Illiteracy 1<br>Primary school 2<br>Secondary school 3<br>High school 4<br>Higher high school 5 |
| C76  | What is your marital status?           | Single 1<br>Married 2<br>Divorced 3<br>Separated 4<br>Widowed 5                                 |
| C77  | What is your job?                      | Employee 1<br>Self employee 2<br>Student 3<br>Unemployment 4                                    |

| Code | Questions                                                                             | Answer coding                                                                                                                                                                                                                                   |
|------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| II.  | Knowledge of HIV                                                                      |                                                                                                                                                                                                                                                 |
| C39  | How do you know a person who is HIV positive?                                         | By looking outside his/her body 1<br>HIV testing 2<br>Based on their lifestyle 3<br>Do not know 4                                                                                                                                               |
| C40  | Which ways HIV transmitted from a person who is HIV positive to other ones?           | Blood contaminated HIV 1<br>Having casual sexual intercourse 2<br>Woman HIV positive to her children 3<br>Do not know 4                                                                                                                         |
| C41  | Do you agree?                                                                         |                                                                                                                                                                                                                                                 |
|      | a. Faithfulness can reduce risk of HIV infection                                      | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
|      | b. Person may be infected HIV if they share toilet with someone who is HIV-positive   | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
|      | c. Use condom correctly can prevent HIV transmission from virginal sexual intercourse | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
|      | d. HIV can be transmitted through mosquito or insect biting                           | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
|      | e. Syringe sharing increase risk of HIV infection                                     | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
|      | f. Cleaning contaminated syringe by water can reduce risk of HIV infection            | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
|      | g. Abstinent from having sexual intercourse can prevent HIV infection                 | <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Do not know                                                                                                                                           |
| III. | Perception of HIV infection                                                           |                                                                                                                                                                                                                                                 |
| C42  | How do you think about your risk of HIV infection?                                    | High risk 1<br>No risk 2<br>Do not know/answer 3                                                                                                                                                                                                |
| C44  | Why do you think that you are not at risk of HIV infection?                           | I am faithful 1<br>I always use condom 2<br>I do not share syringe 3<br>I believe that my sex partner has not infection disease 4<br>I do not do anal sexual intercourse 5<br>I have never received blood transfusion 6<br>Do not know/answer 7 |
| IV.  | Drug use behavior                                                                     |                                                                                                                                                                                                                                                 |
| C1   | When did you begin to inject drug?                                                    | Year: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/><br>Do not remember 9999                                                                                                                               |

| Code | Questions                                                                                 | Answer coding                                                                                                                                                                                                                                         |     |    |        |
|------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--------|
| C5   | During last 6 months, have you ever shared syringe with some ones?                        | Yes 1<br>No 2                                                                                                                                                                                                                                         |     |    |        |
| V.   | Receive harm reduction services                                                           |                                                                                                                                                                                                                                                       |     |    |        |
| C52  | During last 6 months, have you ever heard about safe sex information for last 6 months?   | Yes 1<br>No 2                                                                                                                                                                                                                                         |     |    |        |
| C53  | Did you receive safe sex information from whom/where for last 6 months?                   | Peer educator 1<br>Collaborator of harm reduction education 2<br>Health officer 3<br>Peer 4<br>VCT 5<br>Club for health education 6<br>Wife/husband/lover 7<br>Friend/family member 8<br>TV, radio, book, newspaper 9<br>Leaflet 10<br>Others..... 11 |     |    |        |
| C61  | During last 6 months, did you receive any free condom?                                    | Yes 1<br>No 2                                                                                                                                                                                                                                         |     |    |        |
| VI.  | Sexual behavior                                                                           |                                                                                                                                                                                                                                                       |     |    |        |
| C28  | During last 12 months, do you always use condom when having sexual intercourse with whom? | Sexual partner                                                                                                                                                                                                                                        | Yes | No | No sex |
|      |                                                                                           | Lover/spouse                                                                                                                                                                                                                                          | 1   | 2  | 3      |
|      |                                                                                           | Irregular sex partner                                                                                                                                                                                                                                 | 1   | 2  | 3      |
|      |                                                                                           | Commercial sex worker                                                                                                                                                                                                                                 | 1   | 2  | 3      |

## APENDIX B

### MAP OF PROVINCES OF THE SURVEY ENTITLED “FINAL EVALUATION OF PREVENTING HIV PROJECT IN VIETNAM”



**BIOGRAPHY**

|                              |                                                                                                                                                                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>                  | Vu Van Chieu                                                                                                                                                                                                                               |
| <b>DATE OF BIRTH</b>         | July 19, 1975                                                                                                                                                                                                                              |
| <b>PLACE OF BIRTH</b>        | Ha Nam, Vietnam                                                                                                                                                                                                                            |
| <b>INSTITUTIONS ATTENDED</b> | Hanoi Medical University, 1993-1999<br>General Medicine Doctor<br>Hanoi University of Foreign Language, 1998-2001<br>Bachelor of English language<br>Mahidol University, 2009-2010<br>Master of Arts (Population and Reproductive Health)  |
| <b>SCHOLARSHIP RECEIVED</b>  | Vietnam HIV/AIDS Prevention Project funded by World Bank                                                                                                                                                                                   |
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