FACTORS ASSOCIATED WITH CONDOM BREAKAGE AMONG MEN IN KANCHANABURI DEMOGRAPHIC SURVEILLANCE SYSTEM

DONLACHAI HAWANGCHU

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS
(POPULATION AND REPRODUCTIVE HEALTH RESEARCH)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2008

Thesis
entitled

FACTORS ASSOCIATED WITH CONDOM BREAKAGE AMONG MEN IN KANCHANABURI DEMOGRAPHIC SURVEILLIANCE SYSTEM

……
Mr. Donlachai Hawangchu
Candidate

……
Emeritus Prof. Aphichat Chamratrithirong, Ph.D.
Major - Advisor

……
Assoc. Prof. Philip Guest, Ph.D.
Co – Advisor

……
Prof. Banchong Mahaisavariya, M.D.
Dean
Faculty of Graduate Studies

……
Asst. Prof. Panee Vong-ek, Ph.D.
Chair
Master of Arts Programme in Population and Reproductive Health Research
Institute for Population and Social Research

Thesis
entitled

FACTORS ASSOCIATED WITH CONDOM BREAKAGE AMONG MEN IN KANCHANABURI DEMOGRAPHIC SURVEILLIANCE SYSTEM, THAILAND

was submitted to the Faculty of Graduate Studies, Mahidol University for the degree of Master of Arts (Population and Reproductive Health Research) on

August 26, 2008

……
Mr. Donlachai Hawangchu
Candidate

……
Kerry Richter, Ph.D, M.S.
Chair

……
Assoc. Prof. Philip Guest, Ph.D.
Member

……
Emeritus Prof. Aphichat Chamratrithirong, Ph.D.
Member

……
Rutt Chuachoowong, M.D., Dr.P.H.
Member

……
Prof. Banchong Mahaisavariya, M.D.
Dean
Faculty of Graduate Studies
Mahidol University

……
Assoc. Prof. Sureeporn Punpuing, Ph.D.
Director
Institute for Population and Social Research
Mahidol University

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and deep appreciation to my major advisor Emeritus Prof. Dr. Aphichat Chamratrithirong, my co-advisor Asst. Prof. Dr. Philip Guest and to my external advisor Dr.P.H. Rutt Chuachoowong for their guidance, invaluable advice, supervision, constructive comments and encouragement throughout. Their kindness and support has been much appreciated.

I wish to thank the IPSR Library staff, Computer staff and especially Mrs. Dusita Phuengsamran and Mr. Punya Tongui for their co-operation and generous assistance.

I also wish to thank the Ph.D., and Master program students for their support and encouragement, particularly Pee Nucharee, Nong James, Nong Karn, Pee Pao, Pee Noon, Pee Khom, Pee Ton, Karen and Pui. I will never forget their kind and friendly cooperation and encouragement.

Thanks also to The Wellcome Trust, UK. who provided me with the means to undertake the course and to Population Service International, my previous employer for providing me with the experience to meet the IPSR's requirements. I also express my appreciation to Miss Luxana who provided invaluable administrative assistance from my enrollment to my graduation.

Finally, I would like to thank all my dear friends and fellow students for their collective support for the duration of the course requirement, especially to Anantalia for her encouragement and mental support.

Donlachai Hawangchu

FACTORS ASSOCIATED WITH CONDOM BREAKAGE AMONG MEN IN KANCHANABURI DEMOGRAPHIC SURVEILLANCE SYSTEM.

DONLACHAI HAWANGCHU 5038603 PRRH/M

M.A. (POPULATION AND REPRODUCTIVE HEALTH RESEARCH)

THESIS ADVISORS: APHICHAT CHAMRATRITHIRONG, Emeritus Prof. Dr., PHILIP GUEST, Assoc. Prof. Dr.

ABSTRACT

The objectives of the study are 1) to explore condom breakage experience among men in Kanchanaburi in 2004, 2) to obtain an understanding of social and behavioral factors associated with condom breakage and 3) to explain whether the diffusion in quality of condom or factors associated with condom users contributed to condom breakage. It was found that men who have less than 12 years of schooling have a high percentage of condom breaks. Men who had multiple partners experienced condom breakage more frequently than those with a single partner. Bivariate analysis showed that those who had a regular partner or temporary partner who was not a sex worker had a higher percentage of condom breakage than those who had a partner who was a sex worker. Source of condoms was not significantly different in the rate of condom breakage. However, behavioral factors and experience in condom use, such as the percentage of condom use were factors associated with condom breakage, as well as heavy consumption of energy drinks. By using logistic regression, it was shown that the major factors associated with condom breakage were a lower frequency of sexual intercourse with a condom, inconsistent use and heavy consumption of energy drinks.

KEY WORDS: CONDOM BREAKAGE/ KANCHANABURI / CONDOM / SEX WORKER / ENERGY DRINK

43 pp.

ปัจจัยที่สัมพันธ์กับประสบการณ์ถุงยางอนามัยฉีกขาดของชายในโครงการเฝ้าระวังทางประชากรกาญจนบุรี

(FACTORS ASSOCIATED WITH CONDOM BREAKAGE AMONG MEN IN KANCHANABURI DEMOGRAPHIC SURVEILLANCE SYSTEM)

ดลชัย ฮะวังจู 5038603 PRRH/M

ศศ.ม. (วิจัยประชากร และอนามัยเจริญพันธ์)

คณะกรรมการควบคุมวิทยานิพันธ์: ศาสตราจารย์เกียรติคุณ ดร.อภิชาติ จำรัสฤทธิรงค์, รศ.ดร.ฟิลิป เกสต์

บทคัดย่อ

วัตถุประสงค์ของการศึกษาครั้งนี้คือ 1) อธิบายประสบการณ์ถุงยางอนามัยฉีกขาดของกลุ่มผู้ชายในในโครงการเฝ้าระวังทางประชากรกาญจนบุรี ปี 2547, 2) ความเข้าใจต่อพฤติกรรมที่มีความสัมพันธ์กับถุงยางอนามัยฉีกขาดและ 3) อธิบายถึงสาเหตุของการบอกต่อและความเข้าใจในคุณภาพของถุงยางหรือพฤติกรรมของผู้ใช้ที่นำไปสู่ถุงยางอนามัยฉีกขาด

การศึกษานี้พบว่าชายที่มีระดับการศึกษาต่ำกว่า12 ปีมีอัตราของถุงยางอนามัยฉีกขาดในระดับสูง และชายที่มีคู่นอนหลายคนมีประสบการณ์ของถุงยางอนามัยฉีกขาดสูงกว่าชายที่มีคู่นอนเพียงคนเดียว จากการวิเคราะห์ตัวแปรคู่ (bivariate analysis) ชี้ให้เห็นว่าชายที่มีคู่นอนประจำหรือคู่นอนชั่วคราวที่ไม่ใช้หญิงบริการมีอัตราของถุงยางอนามัยฉีกขาดมากกว่าชายที่มีคู่นอนเป็นหญิงบริการ แหล่งให้บริการถุงยางอนามัยไม่มีความสัมพันธ์ทางสถิติซึ่งถุงยางอนามัยจากร้านสะดวกซื้อและสถานบริการด้านสุขภาพมีอัตราของการฉีกขาดใกล้เคียงกัน อย่างไรก็ตามปัจจัยด้านพฤติกรรมและประสบการณ์ในการใช้ถุงยางอนามัยคือปัจจัยที่สัมพันธ์กับถุงยางอนามัยฉีกขาดอาทิเช่น อัตราการใช้ถุงยางอนามัยเมื่อมีเพศสัมพันธ์ เช่นเดียวกับการดื่มเครื่องดื่มชูกำลังอย่างหนัก

จากการวิเคราะห์ข้อมูลด้วยการวิเคราะห์การถดถอยโลจิสติก (logistic regression)ชี้ให้เห็นว่าปัจจัยหลักที่สัมพันธ์กับถุงยางอนามัยฉีกขาดคือความไม่ต่อเนื่องและไม่สม่ำเสมอในการใช้ถุงยางอนามัยเมื่อมีเพศสัมพันธ์ รวมถึงการบริโภคเครื่องดื่มชูกำลังอย่างหนัก

43 หน้า

CONTENTS

CONTENTS (cont.)

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF ABBREVIATIONS

DDC	Department of Disease Control
DMS	Department of Medical Sciences
FDA	Food and Drug Association
HIV	Human Immunodeficiency Virus
ISO	International Organization for Standardization
KAP	Knowledge Attitude and Practice
KDSS	The Kanchanaburi Demographic Surveillance System
MOPH	Ministry Of Public Health
MSM	Men who have Sex with Men
NSBS	National Sexual Behavior Survey of Thailand
PAK	Practice Attitude Knowledge
PPHO	Provincial Public Health Office
RCDC	Regional Office of Communicable Disease Control
STD	Sexually Transmitted Disease
SW	Sex Worker
THO	Thai Health Organization
TISI	Thai Industrial Standard Institute
UNAIDS	United Nations Program on HIV/AIDS
UNFPA	United Nations Population Fund

CHAPTER I

INTRODUCTION

1.1 Background

The HIV virus or “AIDS” was first identified in 1980. After that, in 1984, the discovery of the first HIV patient in Thailand made people aware of the importance of condom use to protect themselves from the then untreatable disease. Thailand has been promoting condom use for more than 20 years, initially for family planning purposes, and then after the beginning of the HIV/AIDS epidemic, an intensive self protection campaign was initiated. Then, the Ministry of Public Health (MOPH) promoted condom use for prevention and focused on sex workers and men who had sex with men (MSM) , as at that time it was considered that these two groups were the major causes of the spread of HIV. However, since the HIV epidemic has spread to the general population, condom use is now considered as a prophylactic method for sexually transmitted infection, especially for HIV/AIDS, as well as a contraceptive method in family planning programs (Manoke: 2007).

Moreover, evidence of the effectiveness of the 100% condom policy at the National level shows that from 1985 to 1996 STDs have declined by over 90% (UNAIDS : 2000). An April 2008 report from the Department of Disease Control (DDC) Thailand noted that there were 333,336 AIDS patients, 94.53 % of whom were in the labor force and between the ages 15-59, and 83.83% of whom had been infected through sexual intercourse (DDC : 2008). Table: 1.1 illustrates the status of HIV and progress with the 100% condom program.

Table 1.1: HIV situation and progress with the 100% condom program

1980	HIV virus or "AIDS" was identified
1984	Discover of first HIV patient in Thailand
Mid1989	A national sentinel sero surveillance system had been established First round of testing in 14 provinces conducted
June1989	High infection levels among FSW (3.1 %)
June1990	System expanded to include all provinces. HIV prevalence among FSW risen from 3.1 % to 9.3% at national level
Jun1991	HIV had risen to 15.2%. Among conscripted– from 0.5 per cent in November 1989 to 3.0 per cent in November 1991.
Moving the 100% Condom Program to the national level	
Aug1991	National AIDS Committee implements the 100% Condom on a national policy.
Mid1992	All provinces reported that the 100% Condom Program was in place.
MOPH began providing approximately 60 million condoms a year free of charge	

Source: Evaluation of the 100% Condom Program in Thailand (UNAIDS, 2000)

1.2 Condom availability

The National Sexual Behavior Survey of Thailand (NSBS) states that 30% of Thai males knew where to get low cost condoms from condom vending machines in their community or workplace. However, less than 10% of respondents knew about such vending machines in their own community or workplace, and only 5% reported had actually purchased from them. The majority of customers of these machines were made up of young males. Moreover, 36% of young adult males knew more about the vending machines as against 33% of older adult males (Chamratrithirong : 2006). The 100% condom use program in Thailand made condoms more available and accessible in health sectors, such as in STD/AIDS centers, pharmacy sections, regional/ provincial/ community hospitals and district public health offices (UNAIDS , 2000).

Retail shops open 24 hours a day are perhaps the most efficient outlets, and most men make their purchases there (95% by men, compared with 5% of purchases made by women), with the peak time of condom purchasing at night. Older men

generally have no qualms about purchasing condoms, while young adolescents feel shy and may wait until the shop has fewer customers before making their purchase. (Manager online, 2003)

The use of the Internet for online purchase of condoms is increasing rapidly, and provides an alternate to other existing outlets. Condoms obtained through web sites such as www.condomsanook.com also serve users who may feel embarrassed to make their purchases in public.

1.3 Condom quality

Condom production in Thailand has been regulated by the Thai Industrial Standards Institute (TISI) since 1985, and condom companies must meet strict quality production standards in order to pass ISO 4074:1996, 2002. Additionally, in 1989 the MOPH announced that a condom was a medical device, thus requiring producers to indicate the expiry date. Condoms produced prior to 1989 and already on the open market were subsequently recalled for destruction. Between 2003 and 2006, the Department of Medical Sciences (DMS) also conducted condom quality testing at the national level. In 2007, the United Nations Population Fund (UNFPA) released a report on the status of condom pre-qualification from around the world. The three major condom producers in Thailand, SSL Manufacturing, Suretex -Ansell and Thai Nippon Rubber, were then required to have their products undergo exhaustive Food and Drug Association (FDA) testing and screening procedures prior to distribution .to local and foreign markets. The production of condoms that meet FDA standards shows a high level of corporate responsibility and raises the confidence of both local and foreign markets. (K-Econ Analysis, 2004; DMS, 2003-2006; UNFPA, 2007; FDA, 2007).Table: 1.2 lists pre and post-qualification test requirements.

Table 1.2: Condom Test Requirements

Laboratory (Pre-qualification)	Marketing (Post-qualification)
100% electronic pin hole test Airburst test Tensile test Water leakage test Physical appearance test	Seal Packaging Label and brand

As mention above, condoms are produced under various standards with three kinds of condoms available, latex, polyurethane and synthetic (Hollander, 2001). Condom sizes range between 44mm and 56 mm in diameter, with thicknesses of 0.05mm to 0.08 mm and an approximate length of 200mm. Generally, in Thailand condoms with diameters of 49 and 52 mm are the most popular. In the past Thai men often used 49mm size condoms however, are now more likely to fit with 52 mm size. (Condom size, http://203.172.184.9/wbi1/w4.htm) If a condom is either too loose or too tight, it may lead to slippage and or breakage as well as generating a lack of confidence in the use by the user. Thus, choosing the right size condoms can reduce condom failure and improve confidence in their effectiveness.

While improved production and inspection standards have improved the quality of condoms distributed in Thailand, there are still concerns whether the quality of condoms deteriorate within the various distribution outlets such as hospitals, community clinics, drugstores, retail shops, or other means such as vending machines. An example of such concern was found at community website (http://pha.narak.com/topic.php?No=20700) where a man posted a question asking how to buy condoms at a 24 hour convenience shop because " My friend suggest that I not use free condoms given by doctors from hospital" , the inference being that hospital provided condoms were of a poorer quality.

1.4 Justification

The Kanchanaburi Demographic Surveillance System (KDSS) project is a demographic surveillance system, which records on population changes in

demographic, social, economic and health areas with a study size of 100 villages/ census blocks. KDSS data employed in this study is the fifth round of census that collected data from 42,923 participants (20,396 male and 22,542 female).

The 8 September 2007 annual report from the Kanchanaburi Provincial Health Office (KPHO) indicated that within the Province and since 2004, HIV infection increased by 34.03% (1,343 to 1,800 cases) and AIDS patients increased by 45.87% (1,016 to 1,482 cases). In 2004 a KDSS survey reported a relatively high condom breakage rate of 7.2%. Condom breakage information is at Table 1.3

Table 1.3: Study on Condom Breakage

Can Condom Users Likely to Experience Condom Failure Be Identified (Steiner, 1993)	177couples who each used 11 condoms (1,947 acts)found that 103 condoms (5.3%) broke before or during intercourse
Breakage and Acceptability of a Polyurethane Condom: A Randomized, Controlled Study (Institute., 1994)	It shows that 360 couple with 2,059 condoms use has 3% of experience on condom breakage.
Condom Breaks and Slips Occur More Often among Less Experienced Users. (Institute., 1994)	Study among 540 case with 3,754 acts and condoms broke on 209 acts nearly 6%
Survey of Sexual and RH of Sex worker in Thailand(Philip,2007)	815 cases of FSW from 4 provinces: 12.5% Report having had condom breakage experienced during past week.

Although both male and female respondents reported experiencing condom breakage, it is rare that “condom breakage” is a component of studies concerning condom use behavior in Thailand. Table 1.4 details three studies on condom use whose findings resulted in further research and educational programs.

Table 1.4: Advantages from study on condom use

Prospects for Increased Condom Use within Marriage in Thailand (Knodel,1996)	-Considered to be a prophylactic for use with FSW. -Need to be promoted directly as a prophylactic. -Promote condoms use during extramarital sex.
Sexual Activity Among Never-Married Men in Northern Thailand (VanLandingham, 1993)	-Condom use with FSW varies among the samples. -Men whose partners are both FSW and non-FSW do not use condoms with any type of partners. -Implicate to result for AIDS epidemic in Thailand partners.
Two Views of Risky Sexual Practices Among Northern Thai Males (VanLandingham, 1995)	-Many young Thai men are quite concerned about losing their friends to such a preventable disease. -Two aspects of AIDS knowledge are predictive of consistent condom use.

Once people make a decision and determine to use condoms for prophylactic purposes to protect either themselves or their partners, they need to know what factors may have a negative impact on their decision. Condom breakage is one such factor. Therefore, this research will be a study on factors associated with condom breakage in Thailand and hopefully resulting in creating increased interest in the topic and possibly leading to further research.

1.5 Research questions

The following questions will be addressed:

a. Do condom breakage rates differ between distribution outlets?

b. Do condom breakage rates differ among users with different characteristics?

1.6 Objectives

General objective

To explore condom breakage experiences among men in Kanchanaburi Province during 2004.

Specific objectives

The specific objectives of this study are to:

a. Ascertain correlation between condom outlets and condom breakage.

b. Ascertain correlation between user characteristics and condom breakage.

c. Consider other factors contributing to condom breakage.

CHAPTER II

LITERATURE REVIEW

2.1 Cause of condom breakage

A Guttmacher Institute study at four New Zealand Family Planning Association (NZFPA) clinics on condom breakage and slippage indicated that this situation occurred more often among less experienced users. This is explained in the following table (2.1).

Table 2.1: Factors contributed to condom breakage

4 factors from user	4 factors predict increasing risk of breakage
1. Incorrect way of putting on a condom. 2. Use oil based lubricant. 3. Reuse of condom. (after putting on with wrong side) 4. Duration or intensive intercourse.	1. No condom experience. 2. Condom breaks in previous year. 3. Not living with only one partner. 4. Having had 12 years or lower of schooling.

Condoms broke 3.9 times more often among respondents who had a recent history of condom breakage, than among those who did not. Improperly used and non-use of are explanations why actual breakage rates are higher than those are conducted in a laboratory environment. Marital status and cohabitation greatly lowered the probability of condom use at last intercourse. (Guttmacher Institute, 1994)

Oil based lubricants including baby oil, petroleum jelly, face, hand and body lotions or creams, massage or aromatherapy oils can compromise the structural integrity of the condom. The wrong sort of lubricant may also cause genital irritation. Condom manufacturers also recommend that condoms should be stored in a cool and dry place away from direct sunlight.

The overall failure rate for the group that had not used condoms during the previous year was nearly double than the group with no reported condom breakage during that period by13.9% vs. 25% (Steiner, 1993)

2.2 Types of condom breakages

Condom breakages, which occur during intercourse or on withdrawal, are defined as clinical breaks while non-clinical breaks are those, which occur before intercourse is, attempted (e.g. a tear while opening the condom foil package). (Steiner, 1994)

2.3 Determinants of condom breakage

Age

A study titled “Condom breaks and slips occur more often among less experienced users” conducted in NZFPA clinics, used a sample size of 540 respondents who between them reported of 3,754 acts of intercourse. The study indicated that 11% (410 acts) had problems and younger respondents were more likely than older respondents to have experienced a problem. Respondents aged 30 years and below accounted for 72% of all reported breakages. (Guttmacher Institute, 1994)

Education

Educational underachievement was significantly associated with multiple condom breaks. Young men who were two or more years behind in school or had dropped out were almost three times as likely to report multiple breaks as compared with those who had a higher level of education (Lindberg, 1997). Among couples who reported condom breakage, couples aged 30 years or older recorded the lowest rates and /or who had more than 12 years of education (Williams, 1993).

Experience in condom use

An experimental study on condom use among clients in a family planning program showed that couples, who had 5 or more years experience in the use of condoms had a breakage rate of 2% (8 from 424 acts), while those with less than 5 years experience had a failure rate of 7% (102 from 1332 acts).(Guttmacher Institute: 1994).

Consistency of use

An explanation of inconsistent use among married respondents is from some women who said that using a condom can be seen as looking down on their partner, and from husbands who said that they felt like they were treating their spouse as a prostitute and not like a wife (Knodel:1996). A survey into the sexual and reproductive health of sex workers in Thailand found similar attitudes. For example, Tip aged 39, who worked in bar beer in Pattaya said, "I always use a condom except for some regular clients. I always use a condom for the first few times. However, I stop using it with regular clients when we become close. It shows that I trust him and he trusts me". It was also found that of sex workers who had a partner, less than 22% used a condom when having sex with their partner. The high occurrence of non-condom use (72%) with regular partners is attributed to trust and confidence in the safety of the partner, and is consistent with most surveys of condom use around the world for the past twenty years (Chamratrithirong et.al: 2006). In 2007, 12.5% of FSW experienced condom failure (Guest, 2007).

The results of a study of women who preferred the use of condoms can be used to illustrate the other side of the non-use of condoms position. Factors that predispose the long-term use of condoms and decline in condoms usage with the main partner explain by following table (2.2) (Santelli, 1996).

Table 2.2: Factors predispose the long-term and decline in condoms usage

Long-term use of condoms	Decline in condoms use
Emotional closeness and partner support	Increase in the length of the relationship
Cohabitation	Increasing age of the users
The belief that condom use builds trust	
Having a regular or main partner was strongly associated with intentions to use condoms with other partners	

The study on "Condom Characteristics: The Perceptions and Preferences of Men in the United States" provides information on both advantages and disadvantages of condoms regarding psychological and device-related dimension (William, 1993) the result of this study showed in the following table (2.3).

Table 2.3: The Perceptions of men condom users

The advantages	The disadvantages
Prevention of HIV and other STDs	Embarrassment in purchasing or using
Reduction of unintended pregnancies	Making partner think you may have a STD
	Inferring your partner may have a STD
	Fear of breakage

Reduced sensation and allergic reactions are also negative influences in the decline and inconsistency of condom use that is another factor associated condom breakage.

2.4 Type and number of Partners

There are three types of relationships generally accepted in Thai culture:

a. Spouse: A relationship by marriage and or permanent co-habitation (e.g. de-facto or common law marriage).

b. Regular: A relationship conducted concurrently to a permanent relationship on a regular basis with a girl/boy friend or with a sex worker.

c. Temporary: A relationship of opportunity, e.g. “a one night stand” or irregular contact with a sex worker.

The number of sexual partners is the major factor to predict condom use among men. Those, who have had more than four partners in the last year, were less likely to use condoms than were those who had fewer partners (Edwards, 1992). Condom use was less likely when the relationship continued. Even couples who use condoms at the beginning tend to decline later and decline significantly with age and with the longevity of their relationship (Guttmacher Institute, 1994). Couples who were not living together had significantly higher failure rates. The lowest failure rates were for couples aged 30 or older who were living as a couple for more than 12 years **(**Joanis, 1993). The Global Sex Survey in 2004, which collected data from 41 countries indicated that people around the world had an average of 10.5 sexual partners per year, while Thais had 8.5 sexual partners in the same year, increasing to

10.6 in 2005 (Durex, 2005). Also, the NSBST illustrated a pattern of sexual culture continued to influence males aged 25-59.That group had an expectation of having more than one regular partner in their lifetime either serially or simultaneously. There are 31% of men in urban areas and 28% of men in rural areas had two or more regular partners. (Chamratrithirong et.al, 2006) Men in a duel relationship who did not use a condom with their regular partner were more likely to use a condom with their temporary partner. Adolescents who have regular and temporary partners are more likely to seek additional regular partners than those who have no regular partner; they also more strongly intended to have a temporary partner than those who have had only a regular partner. (Rosengard, 2005)

2.5 Tobacco, Alcohol and Sexual Activity

A 2004 Thai Health Organization (THO) survey found that there was correlation between tobacco and alcohol usage and sexual activity. It found that of 100 smokers, 88 will be drinkers and 67 people had sexual experience. The NSBS 2006 also explained that almost 9% of male respondents reported having sex after the last time they consumed three drinks. Condom use subsequent to drinking was low, except for males aged 18-24 reporting more than 10% to 12% usage when having sex after the last time they had consumed three or more drinks. In addition, 83% of married or cohabiting couples have had sex after drinking. The corresponding percentage for single men, who used a condom after drinking was much higher, but still less than one-half at 44.4%.

2.6 Condom quality

Storage

“The Evaluation of the 100% Condom Program in Thailand” found that condom supplies in health sectors such as in STD/AIDS centers, pharmacy sections, regional, provincial, community hospitals and district public health offices were stored under appropriate conditions. Health providers at both the Regional Office of Communicable Disease Control (RCDC) and the Provincial Public Health Office (PPHO) levels were well educated in the requirements for condom storage to ensure

quality. Where possible, condoms were stored in air-conditioned warehouses on shelves raised above the floor to avoid humidity. If the storage facility had no air conditioning, condom supplies would placed in warehouses away from the walls in raised low stacks avoiding sunlight and humidity and providing good air circulation. However, the primary measure to ensure quality is to match supply with demand so that the condom storage is kept to a minimum. Health staff referred to this as the "fresh in and fresh out" policy (UNAIDS, 2000).

The results of a study from the Department of Medical Sciences (Thailand) on the monitoring of the quality of condoms distributed in Bangkok in 1988 and another study in 1997 that focused on whole country can be used to retrospectively determine condom quality. It was explained in 1988, which clinical tests found that only 48.4% of condoms met quality standards. After that, improvement in the quality of condoms from 1993 to 1996 pre and post marketing in both Central Thailand and nationally was illustrated in following table (2.4).

Table 2.4: Monitoring of quality of condom in Thailand

Location	**Test**	**1993**	**1994**	**1995**	**1996**
Central	Pre	99%	97%,	99.8%,	99.6%
Central	Post	84%,	87%,	96%,	93%
Nation	Post	86%	85%,	95%,	96%

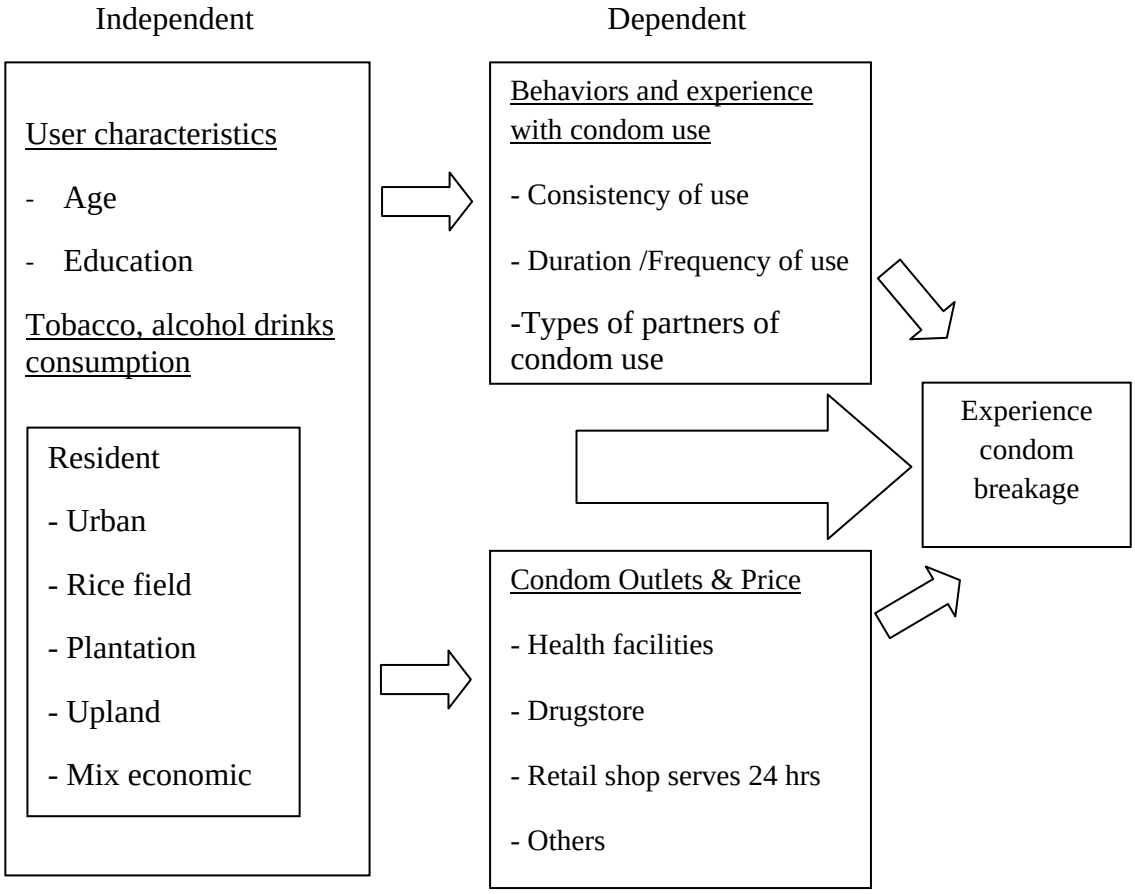
(Isaragool, 1988; Chongthamawat, 1997)

2.7 Condoms are not 100% effective

According to a meta-analysis by UNAIDS the use of condoms is 90% effective in preventing HIV transmission and it has been a key element in reduction of HIV and other STDs in many countries. For example, in Thailand where sexually transmitted infections have been primarily found within the commercial sex trade, condom promotion has been an especially effective method. However, an observational study found that the levels of disease transmission among condom users were actually much higher than that based on laboratory data. Misuse is an explanation why condoms provide less protection in real life than under laboratory conditions (Steiner, 1994).

From a study “Condom characteristics and usage” with 3210 respondents, 63.5% replied that they “must be careful or may break”. (Williams, 1993) The study does not make it clear as to what factors contributed to such a high response. In addition, the effectiveness of condoms in preventing disease transmission depends on the quality of the product and its correct use. Evidence from family planning programs over many years makes it abundantly clear that the condom is a safe and relatively effective method, but that compliance is difficult to achieve with consistency over extended periods (Sinding, 2005).

2.8 Conceptual framework



2.9 Hypothesis

a. Condoms from different outlets have different breakage rates.

b. Condom breakage rates are different among users with different characteristics.

CHAPTER III

METHODOLOGY AND DATA

3.1 Study design

This quantitative study is a cross-sectional design.

3.2 Study population

The population group of this study is men aged 15 to 59 who used condoms during 1 July 2003 until 28 August 2004

3.3 Source of data

Secondary data was obtained from "The Kanchanaburi Demographic Surveillance System 2004" (KDSS-2004). The KDSS-2004 was conducted by the Institute for Population and Social Research (IPSR) Mahidol University, which records population changes in a study area of 100 villages/ census blocks. The data stratified into five stratums and face-to-face interviews were used for data collection. The fifth round of the census was conducted between 1 July to 28 August 2004. The enumeration listed a population of 20,396 males and 22,542 females. As the study deals with factors associated with condom breakage among men, female respondents and males who had not used condoms are excluded from this study. The data was conducted as a census with no specific aim to either study the risk population or marginal groups. Data on condom use was stratified to general population in the area.

3.4 Definition of variables used in this study

All variables used in this study are based on the period 1 July 2003 to 28 August 2004 and are listed below:

Experience Condom breakage: In the KDSS, condom breakage is self-reported based on a question of "From 1 July 2003 until now, have you ever experience condom breakage".

Condom outlets: Based on the question of "where did you buy a condom for your last used". Categories include public and private hospitals, clinics, health centers, drug stores, 24 hours convenience and other retail stores, vending machines and other sources.

Condom user: Male respondents, who use condoms during the study period.

Frequency of use: Based on the question did they use a condom every time when having intercourse? If not what percentage of use?

Type of partners: Based of the question whom did you use condom during 1 July 2003 until August 28, 2004

Note: Variables that are not in the time frame are explained at Table 3.1

Table 3.1: Operational definition of variables

Variables	Description	Scale / Coding
Dependent Variable Condom breakage experienced	Q7.7 From 1 July 2003 until now, "Have you ever experience on condom breakage?"	Nominal scale 1.Yes 2.No
Independent Variables User characteristics Age	Q1.2 "How old are you?"	Interval scale (range from 15-59 years)
Marital status	Q1.8 "What is your marital status?"	Nominal scale 1. Married and ever married 2. Single
Occupation*	Q1.10 "Are you working?" Q.1.10.1 "What type of your work?" 1.Profession 2.Supervisor, Business 3. Administrative 4. Merchandise 5. Services staff 6. Farmer 7. Transportation 8. Production, labor 9. Other (Student/finding a job)	Nominal scale 1.Yes 2.No Recode in to 1. Managerial (1-3) 2. Sale and service (4-5) 3. Farmer (6) 4. Labor (7-8) 5. Not working (9)

Variables	Description	Scale / Coding
Education*	Q.1.9 "Are you studying?" 1. Yes 2. No, I completed level… Q.1.9.2a (Q1.9=2) "What is your highest education?" Then compute and recode variable into group level of education For those who studying I have to reduce the present education level for complete education level	Ordinal scale 0.No education 1.Primary level (0-6 years) 2.Early secondary level (7-9 years) 3.Late secondary level (10-12 years) 4.Bachelor and above (13-16 years above) 5.Informal education (3rd year in primary until complete late secondary level)
Resident		Nominal scale 1.Urban/Semi urban 2.Rice field 3.Plantation 4.Upland 5.Mix economy
<u>Behavior and experience on condom use</u> Duration of condom use*	Q 7.1a "How old when you used condom for the first time?" (Specific year) subtract by Q7.2 "When was the last time you use condom?"	Ordinal scale Specific year Specific D/M/Y

Variables	Description	Scale / Coding
Types of partners of condom use based on SW and Non SW *	Contribute from previous variable by using 'IF' command and recode (base one single partner)	Nominal scale Use condom only with…. 1.Spouse 2.Regular partner who was not a sex worker 3. Temporary partner who was not a sex worker 4.Regular or Temporary partner who was a sex worker 5. More than one type of partner
Frequency of condom use.	Q7.6 "Did you use condom every time when you have had intercourse?"	Nominal scale 1.Yes 2. No(Given percent of overall)
<u>Source of last condom outlet and price</u> Condom outlets	Q7.3 "Where did you buy the condom when you last used?" (Compute and recode to new variable based on staff characteristics at each outlets)	Nominal scale 1.Health facilities (Public, private hospital, clinic, health care center) 2.Drugstore 3.Commercial outlet (24 hrs and convenience store) 4. Other (Coin machine, hotel, friends, brothel, office)
Condom price	Q7.4 " how much did you pay for a piece of condom when you last use"	Ratio scale 0. Free of charge Specific price…..

Variables	Description	Scale / Coding
Tobacco, alcohol drinks consumption *	Q4.7.2 "How often of consumption following items?" 1.Tobacco 2.Beer 3.Liquor 4.Wine 5.Sato (traditional Liquor) 6.Yadong (Traditional Pickle drug) 7. Energy drink Compute new variables based on 7 days consumption by grouping only alcoholic drinks all together.	Nominal scale 1.Once a week 2.Twice a week 3. Three days a week 4.Four days a week 5. Five days a week 6. Six days a week 7.Seven days a week 8 Once a week 9.Twice or three times a week 10.Seldom (occasion)

*Contribute from existing variables

3.5 Data Analysis

The Chi-square test was used to examine the relationship among independent variables and dependent variables. Logistic regression was employed to examine the association between user characteristics and condom outlets and the experience of condom breakage. As study on these issues were not widely examined and with a small study group, the Monte Carlo at significance level 90% or $p<0.10$ are applicable.

3.6 Limitation of the study

As there is no information on the quality of condoms in the KDSS, information on condom quality in Thailand from both industrial certification and laboratory tests from DMS, MOPH has been applied to describe condom quality. Generally, results of condom manufacturer or distributer sponsored surveys regarding consumer preferences are not made available to researchers, program planners and policy maker. (William, 1993)

CHAPTER IV

RESULTS

In this chapter, demographic characteristics of the study population will be summarized. In addition, the chapter will explore 1) the behavior and experience with condom use, 2) the outlets where condoms are obtained and, 3) tobacco and alcohol effects on condom use. As previously covered in the conceptual framework, these factors are associated with condom breakage experience. Therefore, analyses of these factors provide a useful stating point before the Logistic regression analysis that will be presented later in this chapter.

4.1 Characteristics of study population

The study population consisted of 608 male respondents aged 15 to 59 who reported using condoms during the study period. Some interesting points from table 4.1 on user characteristics information are: Men in the 30 to 39 aged brackets formed the largest age group at 25.8%, Most respondents lived in an urban setting (36%) followed by upland dwellers (20.1%). The proportion of single to married men was almost equal (47.2% to 46.4%). Agricultural workers were the largest employment group (30.4%) followed by labor and transport workers (25.2%). By the way, 28.9% of men had completed education to primary level, while 24.8% had a bachelor degree or above. The percentage of condom usage with a temporary partner, spouse and regular partner was fair evenly spread at 40.4%, 31.3% and 28.3% respectively. Respondents who only had sex with their spouse recorded the highest condom usage at 31.2% while those with multiple partners were the lowest at 3.6%. Condom usage by those whose partner was not a sex worker varied little with those whose partner was a sex worker, 23.8% against 22.2%. And 57.4% of respondents used a condom as a contraceptive with 38.5% using to prevent the transmission of STDs

Table 4.1: Percentage distribution on the characteristic of condom users during the period July 2003 to August 2004

Variables		Percentage
Age group		
Age 15-19		15.5
Age 20-24		16.6
Age 25-29		19.7
Age 30-39		25.8
Age 40-59		22.4
	Total	100.0
	N	(608)
Mean age	30.8 years	
Resident		
Urban/semi-urban		36.0
Rice field		14.3
Plantation		12.2
Uplands		20.1
Mixed economy		17.4
	Total	100.0
	N	(608)
Marital status		
Single		47.2
Married		46.4
Widow		0.7
Divorce		1.5
Separated		4.3
	Total	100.0
	N	(608)
Completed education level		
No education		0.7
Informal education		11.8
Primary		28.9
Early secondary level		16.3
Late secondary level		17.4
Bachelor degree and above		24.8
	Total	100.0
	N	(608)

Table 4.1: Percentage distribution on the characteristic of condom user (cont.)

Variables		Percentage
Occupation		
Professional and Managerial		14.0
Sale and services		16.4
Agriculture		30.4
Labor and transportation		25.2
Not working		14.0
	Total	100.0
	N	(608)
Type of partner of condom use		
Use condom with spouse		31.3
Use condom with regular partner		28.3
Use condom with temporary partner		40.4
	Total	100.0
	N	(608)
Types of partners of condom use		
Only with Spouse		31.2
Only with Regular partner who is not SW		23.8
Only with Temporary partner who is not SW		19.2
Only with Regular or Temporary partner who is SW		22.2
Use condom with more than one type of partner		3.6
	Total	100.0
	N	(589)
Reasons of condom use with any types of partner		
Prevent pregnancy		57.4
Prevent STD		38.5
Dual preventions		4.1
	Total	100.0
	N	(608)

4.2 Behavioral and experience with condom use.

Focusing on the total years of condom use, approximately 61.5% of the men had less than 10 years experience with the highest proportion (38.5%) in the 0 to 5 years group. The mean number years of condom usage among these men was 9.8 years. Most of men indicated that they used a condom within the month of interview or one month before (28.6% and 25.3%) However, approximately 81.4% of them used one during last 6 months. Looking at the consistency of condom use, it was found that

62.7% of men used a condom 100% of the time. On the other hand, 26.6% of men reported a condom usage rate of 50% or less. The mean percentage of condom usage among this group was 77%. (Table 4.2)

Table 4.2 :Percentage distribution of behavior and experience with condom use

Variables		Percentage
Five year groups of condom use experience		
0-5 years		38.5
6-10 years		22.4
11-15 years		15.6
16-20 years		9.4
21-25 years		8.2
26-30 years		4.3
31 years and above		1.6
	Total	100.0
	N	(608)
Mean years condom use	9.8 years	
Months of condom use before interview		
12 Months		1.0
11 Months		0.5
10 Months		1.6
9 Months		1.5
8 Months		1.6
7 Months		5.4
6 Months		6.9
5 Months		4.8
4 Months		5.1
3 Months		6.7
2 Months		10.9
1 Month		25.3
Within month of interview (July-Aug)		28.6
	Total	100.0
	N	(608)
Frequency of condom use during last year		
Within 6 months period		81.4
Longer than 6 months period		18.6
	Total	100.0
	N	(608)

Table 4.2 :Percentage distribution of behavior and experience with condom use

Variables		Percentage
Condom outlets categorized by characteristics of staff		
Health facilities		23.0
Drugstore		22.9
Retail shop (24-hour service)		40.1
Others		14.0
	Total	100.0
	N	608
Percentage of condom use during last year		
100%		62.7
51-99%		10.7
1-50%		26.6
	Total	100.0
Mean percentage of condom use 77.6%	N	(608)

4.3 Source of last condom and price

It was found that 40% of respondents made their last condom purchase at a 24-hour retail outlet. Health facilities and drugstores were the next most popular sources at 23.0%, and 22.9% respectively. Other sources such as friends, brothels, schools and vending machines accounted for the remaining 14%.

Almost one-third of the men received free condoms. Close to 40% paid between 11 and 20 Baht per condom with the bulk of the remaining paying 10 Baht or less per item. The mean price of a condom was 9 Baht. (Table 4.3)

Table 4.3 : Percentage distribution of last condom outlets and price

Variables		Percentage
Source of last condom		
Health facilities		23.0
Drugstores		22.9
24hours Retail Outlets		40.1
Others		14.0
	Total	100.0
	N	(608)
Condom outlets grouped by health and non health		
Health (Hospital , Clinic, Drugstore)		45.9
Non health		54.1
	Total	100.0
	N	(608)

Table 4.3 : Percentage distribution of last condom outlets and price (cont.)

Variables		Percentage
Last condom price (price group)		
Free		29.9
1-10 Baht		27.5
11-20 Baht		39.1
21 B above		3.5
	Total	100.0
Mean price of last condom (piece) 9 B	N	(608)

Note: 1 USD = approximately THB 34

4.4 Tobacco, Alcoholic and Energy Drinks Consumption

Results from a multi response question show that the two main preferences of alcoholic drinks for men were beer and liquor (82.1% and 80.7%), followed by energy drinks (59.9%) (e.g. Red Bull and Lipo). Over a 7 day period the questionnaire results indicated that almost half of the respondents were heavy smokers (44.6%), 18% were heavy alcohol drinkers and 11.3% were heavy consumers of energy drinks. (Table 4.4)

Table 4.4: Percentage distribution of tobacco, alcohol and energy drinks consumption

Variables		Percentage
Tobacco, alcohol and energy drinks consumption		**% of responses**
Tobacco		15.5
Beer		22.5
Liquor		22.1
Wine		3.5
Sato (traditional Liquor,Krachae)		3.8
Yadong (Traditional Pickle drug)		9.5
Energy drink		16.4
Coffee		6.7
	Total	100.0
	N	(2008)
Tobacco, alcohol and energy drinks consumption		**% of cases**
Tobacco		56.6
Beer		82.1
Liquor		80.7
Wine		12.8
Sato (traditional Liquor,Krachae)		14.0
Yadong (Traditional Pickle drug)		34.6
Energy drink		59.9
Coffee		25.0
	N	(549)

Table 4.4: Percentage distribution of tobacco, alcohol and energy drinks consumption (cont.)

Variables		Percentage
Heavy smoker (7 days per week)		
Everyday		44.6
No or average consumption		55.4
	Total	100.0
	N	(608)
Heavy alcohol consumer (7 days per week)		
Everyday		18.1
No or average consumption		81.9
	Total	100.0
	N	(608)
Heavy energy drinks consumer (7 days per week)		
Everyday		8.6
No or average consumption		91.4
	Total	100.0
	N	(608)
Heavy smoker -a determinant to consistency of multiple consumption		
Smoking lead into alcohol consumption		
No or not everyday		28.2
Everyday		71.8
	Total	100.0
	N	(608)
Smoking lead into energy drinks consumption		
No or not everyday		34.6
Everyday		65.4
	Total	100.0
	N	(608)

4.5 Condom breakage

Although only 7.2% of men in this study had experienced condom breakage, it is still a significant figure. Hence, as mentioned in the research objective, this issue is the proposed area of study. The factors associated with this phenomenon will be described in bivariate and multivariate analysis. (Table 4.5)

Table 4.5 : Percentage distribution of experienced condom breakage

Variables		Percentage
Condom breakage (during last year)		
Never		92.8
Yes		7.2
	Total	100.0
	N	(608)

4.6 Bivariate Analysis

This section proposes the bivariate analysis to describe the relationship between dependent and each independent and control variables. Table 4.6 shows the relationship between condom breakage and the age groups of men in this study. Men in the 40 to 59 and 20 to 24 age groups had the highest percentage of condom breakage (9.6% and 8.9%), while men age 25 to 29 had the lowest (3.3%)

Table 4.6 : Relationship between age and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Age group			4.256	1.37	0.374
Age 15-19	7.4	94			
Age 20-24	8.9	101			
Age 25-29	3.3	120			
Age 30-39	7.0	157			
Age 40-59	9.6	136			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

Table 4.7 displays the incidence of condom breakage by the area of residence. Men who resided in Upland areas had the highest proportion of condom breakage (11.5%) follow by men in rice field areas (10.3%) then men from plantation areas had lowest proportion of condom breakage (2.7%) with statistically significant.

Table 4.7 : Relationship between area of residence and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Resident area			8.018	1.54	0.091†
Urban	6.4	219			
Rice field	10.3	87			
Plantation	2.7	74			
Uplands	11.5	122			
Mix economy	4.7	106			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

The table 4.8 shows that low educated men had the highest percentage of condom breakage (25%) follow by informal educated men (11%) Although, this evidence is not statistically significant but it shows that, when education level increased decline on condom breakage.

Table 4.8 : Relationship between education level and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Complete education level			5.664	1.42	1.128
No education	25.0	1			
Informal education	11.1	8			
Primary	8.0	14			
Early secondary level	8.1	8			
Late secondary level	5.7	6			
Bachelor above	4.6	7			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

The table 4.9 indicates that men who worked in sales and services had the highest percentage of condom breakage (11.0%) followed by labor and transportation workers. Professionals and managers had the lowest percentage of condom breakage. This evidence is statistically significant among difference occupation sectors.

Table 4.9 : Relationship between occupation and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Occupation Sectors			8.142	1.23	0.087†
Professional and Managerial	1.2	85			
Sale and services	11.0	100			
Agriculture	8.1	185			
Labor and transportation	8.5	153			
Not working	4.7	85			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

Table 4.10 shows the association between the category of partner and condom breakage. Interestingly, the men who had intercourse with sex workers experienced a lower breakage rate (5.3%) than those who had sex with their spouse or a partner who is not a sex worker. Men with multiple sex partners had the highest breakage rate at 14.3%.

Table 4.10 : Relationship between category of partner of condom use during last year and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Category of partners			2.721	1.69	0.606
Only with Spouse	8.2	184			
Only with Reg. who is not SW	7.9	140			
Only with Tem. who is not SW	6.2	113			
Only with Reg. or Tem who is SW	5.3	131			
Multiple partners	14.3	21			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

From table 4.11 it can be seen that men who used condoms 50% of the time or less had the highest breakage rate at 12.3% as against 6.2% for those who used condoms 51% to 99% Those who used condoms 100% of the time had the lowest breakage at 5.2% This evidence is statistically significant with *p <0.05.

Table 4.11 : Relationship between consistency of condom use and condom breakage during study period.

Variables	Break %	Total N	X^2	S.D	sig
Percentage of condom use			8.654	0.874	0.013*
100%	5.2	381			
51-99%	6.2	65			
1-50%	12.3	162			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

Table 4.12 reports the relationship between condom outlets and condom breakage. Condoms bought from a drugstore had the highest breakage rate of 10.8% followed by those purchased from others source a 7.1%. Condoms obtained through health facilities also had a higher breakage rate (6.4%) than condoms from retail shops (5.7%). which has lowest percentage of breakage. There is no statistical difference in the percentage of breakage from these sources.

Table 4.12 : Relationship between condom outlets and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Outlets			3.573	0.99	0.313
Health facilities	6.4	140			
Drugstores	10.8	139			
Retail outlets	5.7	244			
Others	7.1	85			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

Table 4.13 shows that men who were heavy consumption of energy drinks, had almost four times more condom breakages (20.5%) compared to those with average or no consumption (7.6%). As this table may not logically explain whether this variable has accidentally met the criteria or correlate, Table 4.13.1 explains the association between heavy smoking and heavy drinking. All consumption statistics are associated with each other.

Table 4.13: Relationship between heavy tobacco, alcoholic and energy drinks consumption on a weekly basis and condom breakage

Variables	Break %	Total N	X^2	S.D	sig
Tobacco			0.015	0.99	0.903
Heavy consumption	7.4	44			
No or average consumption	7.1	546			
Alcohol drinks			0.00	0.38	0.987
Heavy consumption	18.2	44			
No or average consumption	18.1	564			
Energy drinks			8.591	1.11	0.003**
Heavy consumption	20.5	44			
No or average consumption	7.6	564			

Table 4.13.1: Relationship between Smoking, Alcohol and Energy drinks - a determinant to consistency of multiple consumption

Variables	Smoke %	Total N	X^2	S.D	sig
Alcohol drinks			40.353	0.39	0.000***
Not everyday	38.6	498			
Everyday	71.8	110			
Energy drinks			9.970	1.11	0.002**
Not everyday	42.6	556			
Everyday	65.4	52			

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

4.7 Multivariate analysis of factors associated with condom breakage among men in Kanchanaburi

In order to investigate which factors were associated with condom breakages, a series of ordered logistic regression models were employed. The four categories and factors considered in the logistic regression analysis are;

a. Relationship between condom breakage and characteristic of the user. Factors to examine are following;

(1). Age.

(2). Area of residence.

(3). Level of education that examine between 12 years of schooling and lower, based on evidence from literature review.

(4). Occupation which focuses between agriculture and not agriculture due to agriculture has highest proportion among each occupation; and

(5). Marital status.

b. Behavior and experience with condom usage during study period. Factors to examine are following;

(1). Types of partner based on a sex worker or was not a sex worker.

(2). Duration of condom use between less than and more than five years period.

(3). Frequency of condom use between within and more than six months period; and,

(4). Consistency of condom use when having intercourse.

c. Source of condom and price paid (if any). Factors to examine are following;

(1). Health and non – heath outlets; and

(2). Price range of condom among free, less than 10Baht and, more than 10 Baht of a condom.

d. The relationship between condom breakages and smoking and consumption of alcohol /energy drinks based on weekly basis.

Table 4.14 contains the statistical data on the above categories.

Table 4.14 The Odds of Logistic Regression for factors associated with condom breakage

Factors	Coefficient	Odds Ratio	Sig
Characteristics of condom user			
Age group			
Age 20-24	-.092	0.905	0.862
Age 25-29	-.469	0.365	0.163
Age 30-39	-.116	0.879	0.845
Age 40-59	.260	1.799	0.386
Age 15-19 (ref.)			
Area of residence			
Urban/semi-urban	-.319	0.565	0.204
Rice field	-.029	0.978	0.967
Plantation	-.709	0.231	0.076 †
Mixed economy	-.604	0.361	0.085 †
Uplands (ref.)			
Level of education			
≤12 years	.062	1.181	0.672
>12 years (ref.)			
Occupation			
Agriculture	-.014	0.990	0.980
Not Agriculture (ref.)			
Marital status			
Single	.114	1.21	0.723
Married and ever married (ref.)			
Behavior and Experienced with condom use during past year			
Type of partner of condom use during past year			
Spouse	.189	1.497	0.481
Regular partner who is not SW	.236	1.798	0.333
Temporary partner who is not SW	.154	1.455	0.552
Multiple partners	.704	4.478	0.073 †
Only with Reg. and Tem. partner who is SW (ref.)			
Duration of condom use			
> 5 years	-.247	0.556	0.129
≤ 5 years(ref.)			
Frequency of condom use during the study period			
Last condom use > 6 months period	.612	3.463	0.001***
Last condom use ≤ 6 months period (ref)			
Frequency of condom use during intercourse			
100% use	-.296	0.544	0.092 †
<100% use (ref.)			

Table 4.14 The Odds of Logistic Regression for factors associated with condom breakage

Factors	Coefficient	Odds Ratio	Sig
Last source and price of condoms			
Source			
Non-health outlets	.049	1.044	0.908
Health outlets (ref.)			
Last price paid			
Free condom	.364	1.879	0.152
> 10 B	-.320	0.512	0.107
≤10 B (ref.)			
Tobacco, Alcoholic and Energy drink consumption during study period			
Heavy Tobacco consumption	-.016	0.940	0.743
No or average consumption (ref.)			
Heavy alcoholic drinks consumption	-.208	0.721	0.478
No or average consumption (ref.)			
Heavy energy drinks consumption	.162	1.353	0.010**
No or average consumption (ref.)			
Log Likelihood		-132.36268	
Prob> (X^2)		0.0096	
Pseudo R^2		0.1401	

Note † p<0.10 *p<0.05; **p<0.01;***p<0.001

After all variables were applied in the model to explain what were the factors associated with condom breakage experienced among men in this study, it was found that age was not significantly associated with condom breakage. Men who lived in plantation and mixed economic areas had a lower percentage of condom breakage compared with those who lived in upland areas. Men who had more than one type of partner were 4.4 times more likely to have experienced condom breakage than those whose partner who was a sex worker. The frequency of condom use was a major factor in condom breakage. Men who had not used a condom for at least 6 months experienced 3.4 times more condom breakages than those who used a condom within the last 6 months of the study period. Additionally, 100% of condom use reduced the chance of condom breakage by 46% .There was no statistical difference between the source of the condoms and price paid and breakage rates. Table 4.13 also shows that men who were heavy energy drink consumers had a condom breakage rate 1.3 times more than those men were average or non consumers.

CHAPTER V

FINDING, DISCUSSION AND RECOMMENDATIONS

This study has explored the condom breakage experiences among men in Kanchanaburi Province (Thailand). The research was aimed at understanding the correlation between the sources of condoms, condom user characteristics and the factors contributing to condom breakage. The analysis includes both descriptive and bivariate analysis.

5.1 Finding

The study showed that men who lived in plantation and mix economy areas had a lower percentage of condom breakages. Men who had more than one type of partner had the highest percentage of condom breakage. Major factors associated with condom breakage were a low frequency of condom use, less than 100% of condom usage, and incidentally found that the heavy consumption of energy drinks also a correlate factor.

5.2 Discussions

Characteristic of condom users.

The men in this study had a mean age of 30.8 years and mostly lived in an urban setting (36%) followed by upland areas (21%). The proportion between single and married men was almost equal, 47.2 to 46.4 %. Those with a primary level education only represented 29% of the survey group, as against 25% who had a bachelor degree or higher qualification. Bivariate analysis showed that low educated men had the highest percentage of condom breakage (25%) follow by informal educated men (11%) but not statistically difference among each education level group. From this, it

can be inferred that reproductive health, sex education and STD prevention programs conducted at educational institutions contribute to correct condom usage. The programs are made available as a matter of Government policy and or by international and local NGOs. (Global Fund round 1-2, 2007) However, it cannot ignore by policy makers or program implementations to aim at these two groups.

During the study period, 40.4% of men stated that they had used a condom with a temporary partner, 31.3% reported condom use with their spouse and 28.3% of men used with a regular partner. Among men who had multiple partners, only 3.6% used condoms compared to 31.2% of those with their spouse. 57.4% of men used condoms for contraceptive purposes while 38.5% used them as a measure against STDs.

Bivariate analysis shows that men who live in upland areas may have difficulty in 1) accessing condom outlets, 2) experience reduced product quality by keeping and using condoms past their “use by date”, and 3) have little or no access to condom education programs.

Consideration should therefore be given by the government and NGOs to providing the appropriate programs to the upland areas.

Behavior and experience in condom use during the study period.

Approximately 61% of men had 10 or less year’s experience of condom use, with 38.5% with 5 or less years experience. The average years of condom, use among the study group was 9.8. Bivariate analysis shows that the 6 to 10 years group had the highest proportion of condom breakage although increased experience should lead to lower breakage figures. This can explain by NSBS 2006, where the average age for a Thai male the first sex experience was 17. It follows then, that if a 17 years old subsequently has 6 to 10 years of condom usage, he would fall into the 23 to 27 age group in the study. That group had approximately 8.9% of condom breakage. It could be assumed that the more familiar couples are with condom usage, the less likely they should experience breakages. In reality, after 5 years the group may not use condoms on a regular basis and become less familiar with their use and thereby contributing to a

higher breakage rate. Also on the balance of probabilities, higher usage rates would generate higher breakage rates.

Most of respondents were considered sexually active as 81.4% of them had indicated sexual activity during last 6 months of the study period. Men who had not had sex for at least 6 months were 3.4 times more likely to experience condom breakage than the more sexually active. It is assumed that those who used a condom within the last 6 months of the study period had a higher frequency of sex and with more than one partner.

For consistency of use, 62.7% of men used a condom every time they had sex, this was the largest proportion within the study group. Just over a quarter of the men (26.6%) used a condom less than 50% of the time. Men who used condom lower than 50% had the highest percentage of condom breakage (12.3%)

It is fair to assume that the men using condoms with only one partner, by virtue of sexual activity, have had more experience in the correct use of condoms thus incurring less breakage. Conversely, condom usage with a partner may also diminish as the relationship progresses. Therefore, less use would produce less reports of condom failure thereby affecting the percentage results of breakage. As for condoms themselves, those being used by men with multiple partners have the highest breakage rate. This can be for many reasons such as carriage in areas where the condom package can be easily damaged such a wallet or purse. Storage in areas of high temperature and or humidity can also lead to deterioration. Among those men with multiple partners, inconsistent use of condoms may cause one or more partners to have doubts about their STD status. The male partner may then decide not to use condoms to avert STD suspicions. The lower use leads to lower familiarity and thus to a higher breakage rate.

The above discussion explains why men who have single partner, regardless of the category, had lower percentage of condom breakage compared with those who had multiple partners.

Men who used a condom with a partner who was not a sex worker recorded more breakages than those whose partner was a sex worker. Although not statistically different, the finding could be attributed to condom promotion and education

campaigns directed at the sex worker industry. For example, “The 100% Condom Promotion Program in Thailand” was first developed and implemented in Thailand in 1991. The aim of the program was to “encourage men to consistency use condoms with sex workers”. It could be said, subsequently sex workers who have a proper knowledge of condom use through implemented programs from either governments or NGOs, then they pass that knowledge on to their male clients thus possibly lowering the risk of condom breakages.

Use of condom promotions and campaigns are highly effective for those men who have a single partner. For those who have multiple partners, the effectiveness may not be as great. Anecdotal evidence suggests that men who have multiple partners may wish to conceal their use of condoms from one or more of their partners. This may then lead to the improper storage and subsequent condom deterioration.

Sources of condoms and price paid

This section deals with the quality of condoms from different sources. Almost half of the study group (40%) acquired their condoms from 24-hour retail outlets. Most of the remainder obtained their condom supplies from health facilities (23%) and drug stores (22.9%). The results showed condoms purchased from drug stores had the highest failure rate at 10.8% with those obtained from “other sources” (e.g. vending machines) were in second place with 7.1% breakage. Condoms from health facilities and retail outlets had similar breakage rates at 6.6% and 5.7% respectively.

Although there is no statistical difference in the source and breakage rate of condoms, the actual figure differentials could be explained by the followed factors;
a. storage of the product; b. product turnover; and c. the type of supply outlet. Retail outlets had a high rate of product turnover due to the convenience of their opening hours and also offered an air conditioned storage environment. Health outlets offered similar storage facilities and although turnover may be lower due to client “embarrassment”, although potential users were more likely to be given advice on the correct use of condoms. The reason that drugstores had the highest percentage of breakages could be because; a). The community nature of most drugstores may deter locals from purchasing condoms because of the “embarrassment” factor. b). Many

drugstores, particularly in rural areas are not air condition thereby contributing to poor storage conditions and c). Low turnover because of alternate and more discrete sources.

There is a perception that the higher the price paid for a condom, the better the quality. Some people are wary of condoms provided free because of quality concerns. These concerns may have been justified prior to 1989 when there were no government or industry standards for Thai manufactured condoms. When condom use have been promoting either for family planning program (since 1970) or HIV prevention program (since 1991), government sector, MOPH was considered as key organization both implement and subsidized the cost either free or low cost, have had to take action for the programmes under these conditions without highly equip on knowledge of condom use to target group. By the way, DMS was conducted condom quality testing at national level during 2003-2006, which later than condom promotion had been implemented. Therefore, this can explained diffusion of quality of condom which still exist from past to present time.

It is assumed that higher condom prices relate in part to the provision of better quality storage conditions such as those of air conditioned 24 hour retail outlets.. Government and NGOs should therefore maintain the quality of their condom supplies by keeping them under the appropriate storage conditions. This may improve the image of condoms, which are distributed free of charge or at reduced costs.

Tobacco, alcoholic and energy drinks consumption

Through literature reviews, an incidental finding of this study was that men who were heavy smokers were most probably heavy drinkers of alcohol and energy beverages as well as having a high level of sexual activity. However, those habits had no significant affect on condom breakage figures although it was noted that those who preferred energy drinks were more likely to experience condom breakage.

5.3 Recommendation

Based on the study figures and findings, and to assist in lowering the level of condom breakage, the following recommendations are made;

a. Increase the level of condom education among lower educated groups.

b. Increase the level of condom education among men who have either a single or multiple partners.

c. Educate condom users to assess their risk factor for condom breakage.

d. Improve packaging to increase condom storage life under more adverse conditions.

e. Develop more discreet packaging to reduce the “embarrassment” factor when making a purchase.

f. Men considered as determinant of condom use in Thai social norm, then it should encourage women to use their negotiating skills to encourage the proper use of condoms with their partner.

5.4 Suggestion for further study

If more specific research into condom breakage is to be undertaken, then such research should;

a. use an increased study population to be clearly explained the pattern or trend in this phenomena.

b. focus directly on factors associated with condom breakage include energy drinks consumption.

c. assess and validate the effectiveness of KAP and PAK concepts for condom use education.

All above suggestions would be an advantage for condom user to assess their risk of condom breakage, and how to use it properly for consistency and validity on HIV/AIDS prevention that 100% use contributed to ultimately effective prevention.

REFERENCES

AIDS Division Bureau of AIDS, TB and STIs Department of Diseases Control. (2008).[WWW page]. http://www.aidsthai.org/aidsenglish/condom02.html

Chamratrithirong, A, et.al. (2006). National Sexual behavior survey of Thailand Institute for Population and Social Research, Mahidol University.

Condom size, (n.b) [WWW page].http://203.172.184.9/wbi1/w4.htm

Chongthamawat, Supawan. (1997). Monitoring of Condom Quality in Thailand. Division of Toxicology, Department of Medical Sciences, 39 (2), 67-74

Durex.(2005).Global sex survey 2005.[WWW page].www.durex.com/gss

Edwards, S. (1994). Most Adults in the United States Who Have Multiple Sexual Partners Do Not Use Condoms Consistently. *Family Planning Perspectives*, *26*(1), 42-43.

FDA. (2001). Monitoring of Condom Quality from Government in 2000 - 2001. [WWWpage].http://www.fda.moph.go.th/fda-net/html/product/doctor/condom-control.htm

FDA.(2007).Quality of condom 2003-2006. [WWW page]. http://www.fda.moph.go.th/www_fda/view_news.php?Submit=Clear&ID_Inf_Nw_Manager=0000000161

Hollander, D. (1996). Thai Program Increases Men's Use of Condoms With Sex Workers. *International Family Planning Perspectives, Vol. 22, No. 4. (Dec., 1996)*, 177-178.

Hollander, D. (2001). Users Give New Synthetic and Latex Condoms Similar Ratings on Most Features. *Family Planning Perspectives, Vol. 33, No. 1. (Jan. - Feb., 2001),*, p. 45.

How to buy condom from 24 hrs shop, (n.b) [WWW page]. http://pha.narak.com/topic.php?No=20700

Isarangool Prachuab. (1988). Monitoring of Condoms Quality Distributed in Bangkok. Division of Toxicology, Department of Medical Sciences, 30(3), 203-208

Guttmacher Institute. (1994). Condom Breaks and Slips Occur More Often among Less Experienced Users. *Family Planning Perspectives*, *26*(6), 283-284.

K-Econ Analysis. (2004).Thai Condom Export. *Kasikorn Bank Research Center*, [WWW page].http://www.kasikornbank.com/portal/site/KResearch/

Knodel, J., & Pramualratana, A. (1996). Prospects for Increased Condom Use Within Marriage in Thailand. *International Family Planning Perspectives, 22*(3), 97-102.

Lindberg, L. D. (1997). Young Men's Experience with Condom Breakage. *Family Planning Perspectives, 29*(3), 128-140.

Manok. (2007). How well do you know condom.[WWW.age].www.oknation.net/ blog/bigboom007/11/27/entry-1

MANGO-metro sexual guide.(2003).Thai men use condom more than 50 million per year. [WWW page]. http://www. mangomag.com/hboard/ hboardprint.php?cat=02&type=boa

Philip, (2007). Survey of Sexual and Reproductive Health of Sex Workers in Thailand (Report). 39-43

Pleck, J. (1993). Changes in Adolescent Males' Use of and Attitudes Toward Condoms, 1988-1991. *Family Planning Perspectives, 25*(3), 106-117.

Rosengard, C. (2005). Adolescent Partner-Type Experience: Psychosocial and Behavioral Differences. *Perspectives on Sexual and Reproductive Health, 37*(3), 141-147.

Sinding, S. W. (2005). Does 'CNN' (Condoms, Needles and Negotiation) Work Better than 'ABC'(Abstinence, Being Faithful and Condom Use) in Attacking the AIDS Epidemic? , *No. 1*(Vol. 31, . (Mar., 2005),), 38-40.

Santelli, J. S. (1996). Stage of Behavior Change for Condom Use: The Influence of Partner Type, Relationship and Pregnancy Factors. Family Planning Perspectives, Vol. 28, No. 3. (May - Jun., 1996), pp. 101-107.

Steiner, M. (1993). Can Condom Users Likely to Experience Condom Failure Be Identified. *Family Planning Perspectives, Vol. 25, No. 5. (Sep. - Oct., 1993), pp. 220-223+226.*

Steiner, M. (1994). *Condom Breakage and Slippage Rates Among Study Participants in Eight Countries*. International Family Planning Perspectives, *20*(2), 55-58.

UNFPA. (2007).Status of condom pre-qualification in 2007.Report

UNAIDS. (2000). Evaluation of the 100% Condom Programme in Thailand. 14,17-18,32-33.

Williams, (1993) .Condom Characteristics: The Perceptions and Preferences of Men in the United States. Family Planning Perspectives, 25(2), (Mar-Apr., 1993), 67-73

BIOGRAPHY

NAME	DONLACHAI HAWANGCHU
DATE OF BIRTH	November 28, 1979
PLACE OF BIRTH	Samutsakorn, THAILAND
INSTITUTION ATTEND	Bachelor degree of Art, 2001 Ramkhamhaeng University Thailand
	M.A. in Population and Reproductive Health, 2008 Institute for Population and Social Research Mahidol University, Thailand
FELLOWSHIP	Wellcome Trust, UK.
CONTACT	hawangchu@hotmail.com