

Drug Use and Risk of HIV and Other Sexually Transmitted Infections (STIs) Among Thai Adolescents and Young Adults – A Review

Shamsudeen YAU, MSc Archin Songthap, PhD*

Faculty of Public Health, Naresuan University, 65000 Muang District Phitsanulok, Thailand

Email of corresponding author: ar_song@yahoo.com

Abstract

Drug use in Thailand and its accompanying consequences, which are most injurious to adolescents and young adults, are uncharacteristically high. The Office of the Narcotics Control Board estimated that the number of people using methamphetamine had dramatically increased by close to thirteen folds from 1993 to 2002; one of the alarming figures that stimulated the government to initiate laws to fight drug use, starting with the war on drugs in 2003. Methamphetamine is the most commonly used drug which is mostly taken orally rather than intravenously. Other drugs such *yaa baa* (a combined mixture of caffeine and methamphetamine), amphetamine, heroin and midazolam, are also widely used either smoked or orally. Of the various consequences of adolescents involvement in drug use, the government has particularly paid due attention to the inarguably increased risk of HIV/STIs among this population. The risk of HIV among injecting drug users ranges from six to eleven times more than in non-injecting drug users. Other sexually transmitted infections, such as Chlamydia, Gonorrhoea, Syphilis, HIV, Hepatitis B Virus (HBV), Herpes Simplex Virus (HSV), are also prevalent among both injecting and non-injecting drug users; Chlamydia was the most prevalent while HIV was the least. However, HSV and Chlamydia were more predominant among women while HBV was more among men. While the incidence of HIV infection is not associated with the type of drug injected, the risk of HIV is higher in methamphetamine users among whom sharing injecting equipment is characteristically higher than in users of other types of drug. Drug injecting history, in addition to chained smoking and being a binge drinker or a former drinker were behavioural factors linked to HIV prevalence. Furthermore, the frequency of injection and injection equipment sharing, history of sexual abuse, and selling sex were also risk factors for incidence of HIV among users. The aim of this paper, therefore, is to provide a detailed summary of the hitherto risk of HIV/STIs among Thai adolescents and young adults who use drugs and to further provide constructive suggestions to mitigate the increasing vulnerability of this population to HIV/STIs.

Keywords: Drug Use, HIV, Sexually Transmitted Infections, Adolescents, Young Adults.

1. Introduction

Historically, illicit drug use has not received as much attention as communicable diseases like HIV/AIDS and non-communicable diseases like cancer and CVD have continued to enjoy. However, the problem had begun to draw the world's attention when reports from world health giants, such as the United Nations Health Organizations, had consistently reported the increasingly alarming number of adolescents and young adults involved in drug use; which is, for the most part, particularly disturbing because it complicates and undermines the global campaign to protect and preserve the sexual and reproductive health (SRH) of this teeming population as they embark on one of the life's most important transitions – childhood to adulthood.

Even in Thai societies, drug use and its accompanying consequences, which are most injurious to adolescents and young adults, are uncharacteristically high. The Office of the Narcotics Control Board estimated that the number of people using methamphetamine had dramatically increased by close to thirteen folds from 1993 to 2002; one of the alarming figures that stimulated the government to initiate laws to fight drug use, starting with the war on drugs in 2003. Despite these decades-long stringent laws and policies on illicit drugs in Thailand, drug use especially among adolescents and young adults, like most parts of the world, has continued to astronomically grow in the recent past. While adolescence (aged 14 - 18) and young adulthood (aged 19 - 24) represent nearly a quarter of the global population (Das Gupta et al. 2014), they make up about a fifth of Thai total population¹; never in history has the world ever had such a staggering number of youths. As the adolescent population multiplies, so are the problems that implicatively affects their health outcomes more especially their SRH. This growing number of youths might pose additional difficulties into the fight against drug use in Thai societies and make it even more complicated than ever before.

Similarly, adolescent drug use is a multifaceted problem with several facilitating factors at play to explain the youths' vulnerability to drugs and subsequently HIV/STIs. For example, social influence, personality influence and environmental influence are background forces that influence adolescent's use of drugs, of which social influence is by far the most predisposing factor to drug use (Orlin Todorov, Elena Psederska 2016). In

¹ http://www.indexmundi.com/thailand/demographics_profile.html

addition, poor knowledge of STIs (Svensson 2013) coupled with the alarming risky sexual behaviors (Tipwareerom et al. 2011) and high tendencies for juvenile delinquency and crime (Murphey et al. 2013; Gardner & Anderson 2011) that adolescents are generally known to exhibit, place them at a much greater risk of HIV/STIs than any other age groups. Moreover, many side effects linked to use of drugs, such as osteoporosis, anxiety, depression, erectile dysfunction, libido loss, fatigue, infertility, loss of muscle mass and strength, menstrual and lactation irregularities, symptoms of narcotic-induced hypogonadism, endocrine disruption, cognitive impairment, and immune system compromise, have been documented (Barclay et al. 2016; Bates 2015; Barth 2011). Bad academic behaviours such as low attendance, poor academic performance, and a greater likelihood of dropping out or being expelled are highly associated with students using illicit drugs (Murphey et al. 2013; Gardner & Anderson 2011).

Along with other consequences of adolescents involvement in drug use, the Thai government has particularly paid due attention to the inarguably high risk of HIV/STIs because of the consistent evidence that has repeatedly linked drug use to risk of contracting HIV, hepatitis, and other diseases (Barth 2011; Murphey et al. 2013). Additionally, adolescence is a period that characteristically poses an increased vulnerability for substance abuse (Murphey et al. 2013) due to rapid physical and psychological changes; they also enjoy greater freewill, with lesser adults' supervision, to make their own decisions and choices (Ford & Watkins 2012). Sadly, drug users have a reduced life expectancy than non-drug users due to the increased risk of injuries (such as those resulting from car crashes), suicide, homicide, and illnesses (Murphey et al. 2013). While the risk of HIV/STIs is evidently high among adolescents and young adults who use drugs (Couture et al. 2011), it is even more so among injecting drug users; risky behaviours, predominantly sharing injecting equipment among users, are vastly responsible for the heightened risk. Even though behaviour modification interventions to prevent HIV/STIs among the adolescent's population across the entire Southeast Asia have been promising, the key populations such as Drug Users (DU) have been consistently left out (Badalà et al. 2008). Perhaps this explains why injecting drug use poses the greatest threat to Thailand's longstanding and unrelenting fight against HIV/AIDS infections (Windle 2015).

The aim of this paper, therefore, is to provide a detailed summary of the hitherto risk of HIV/STIs among Thai adolescents and young adults who use drugs and to further provide constructive suggestions to mitigate the increasing vulnerability of this population to HIV/STIs.

2. Drug Use and Socioeconomic Status

It is a well-established fact that "*wealth is health*"! Therefore, hardly can one talk about drug use and its increased risk of HIV/STIs as a consequence without bringing into the spotlight the gigantic influence of socioeconomic status. Apparently, the financial strength and social status of an individual inevitably determine their life opportunities – such as occupation – and life choices – such as health and education services – and is, whether directly or indirectly, reflective of their health outcomes. Comparable to global societies, there exist some strata of social classes in Thailand and, unlike some few lucky nations, the gap between the upper class and the lower class is becoming quite glaring. These limited life choices among the lower and, to some extent, the middle class of the Thai societies, is one of the forces driving adolescents and young adults from the lower income groups into drug use (Murphey et al. 2013; Ford & Watkins 2012). This is because it is inarguably more likely to find adolescents from a low socioeconomic status in an occupation characterized by hard labour and hence they engage in using drugs that, as most of them proclaim, complement their strength while carrying out their assignments (Sherman et al. 2009).

3. Risks of HIV/STIs among Non-Injecting Drug Users

For decades, adolescents and young adults have been disproportionately bearing a significant percentage of the global burden of HIV/STIs. Even though HIV-related mortality in Thailand has decreased by more than half (Fallis 2013), such success is hardly a reflection of the HIV/AIDS situation among the country's adolescents population; according to WHO, from 2005 to 2013, the adolescent population is the only age group whose HIV-related mortality has not dropped (World Health Organisation 2014). While the current growing involvement of adolescents in the use of drugs (both licit and illicit) might signal the possibility of synergy that exacerbates the increasing sexually transmitted infections among this vulnerable population, the recent changing trends in drug use – from injecting to non-injecting drugs – might to a certain degree reduce the elevated risk of HIV/STIs pose by injecting drugs. Of the various drugs used by adolescent and young adults in Thailand, methamphetamine is the most commonly used drug (Lasco 2014; German D, Sherman SG, Latkin CA, Siroj B, Thomson N, Sutcliffe CG, Aramrattana A 2009; DiMiceli et al. 2016; Chomchai et al. 2016; Willard et al. 2015; Martin et al. 2010); which is mostly taken orally rather than intravenously. Other drugs such as *yaa baa* (a combined mixture of caffeine and methamphetamine) (Windle 2015), amphetamine (Melbye et al. 2002; Phupong & Darojn 2007), heroin and midazolam, are also widely used either smoked or orally (Srirak et al. 2005).

The prevalence of HIV/STIs even among the non-injecting drug users is unacceptably high. For instance, no

fewer than a quarter of adolescents and young adults, the majority of whom use methamphetamine, were tested positive for at least one laboratory-confirmed STI, which were generally more prevalent in women than in men; Herpes Simplex Virus (HSV) and Chlamydia were more prevalent among women while Hepatitis B Virus (HBV) was more common among men (Celentano et al. 2008). This is no surprise as the majority of adolescents and young people who engage in drugs do not, for the most part, have the basic knowledge to guide their life choices and safe-sex practice and, in most cases, they compromise their safety by negligently engaging in sexual risk practices. Furthermore, in a randomized behavioural intervention trial among adolescent and young adult, nearly an eighth of the participants acquired at least one STI over the twelve months follow up period; Chlamydia had the highest prevalence and HIV was the least prevalent (Kasner et al. 2013). Additionally, investigation of the influence of strategies at the community level to reduce substance use and risk behaviors for HIV/STIs among adolescents and young adults revealed that at baseline, the overall prevalence of HIV/STIs was 12.4%; when individual STIs were assessed, Chlamydia (10.0%) was the highest, followed by Gonorrhoea (1.9%) and HIV (1.1%); although this prevalence was uneven across the participating districts, many socioeconomic indicators could be the explanation for the observed variability (Latimore et al. 2014), highlighting the dynamics of the contributors to the increased risk of HIV/STIs among the adolescents population. Not only is it plausible, it is also apparently possible, to expect interactions between various STIs to better understand whether or not they interplay to escalate the effect of one another when infection occurs. However, literature evidence to support such claim in the context of Thailand is yet to emerge.

4. Risks of HIV/STIs among Injecting Drug Users

Like most parts of the world, the association between injecting drug use and the risk of HIV/STIs in Thailand is unprecedentedly high. Precisely, Thailand has the world's third highest HIV prevalence among injecting drug users (UNEP 2014). It is even more worrisome as the risk is more pronounced among adolescent and young adult users. Additionally, the emergence of the epidemic use of other types of injecting drugs (such as Heroin, Opioid, etc.) in Thailand, has significantly increased the vulnerability of the users to HIV and other STIs (Schleifer et al. 2008). In fact, injecting drug users are, to a large extent, the major drivers of the epidemic spread of HIV among adolescents and young adults in Thailand. Despite the 100% increase in the proportion of people who confided using clean injecting tools at last drug injection from 2009 – 2014, they still contribute a significant proportion to the overall national incidence of new HIV infections (Fallis 2013). Concisely, the prevalence of HIV among the injecting drug users is more than twice the prevalence in gay men and men who have sex with men (Unaid 2017), representing the highest threat to the nation's fight against HIV/AIDS epidemic. While drug use, whether injecting or non-injecting, poses disturbing risks of HIV/STIs, the risk difference is alarmingly higher among those who inject it.

Mounting evidence highlighting the magnitude of HIV risks associated with injecting drugs has been reported over the recent past. A study of exclusively female participants (who use both injecting and non-injecting drugs), for instance, showed that the risk of HIV is six times more among injecting drug users than non-injecting drug users (Srirak et al. 2005); a similar study reported an astronomical HIV risk of eleven folds higher among injecting drug users than in non-injecting drug users (Razak et al. 2003). Furthermore, the lowest rate of condom use in Thailand is among injecting drug users (Fallis 2013) which could avoidably increase their odds of infections further. Therefore, the highest risk, burden and an increased vulnerability to HIV/STIs seen among this category of drug users are evidently driven by multiple factors. However, along with other health risk behaviours, HIV transmission is largely driven by sharing contaminated injecting tools among users. While the incidence of HIV infection is not associated with the type of drug injected, the risk of HIV is higher in methamphetamine users among whom sharing injecting equipment is characteristically more common than among other types of drug users (Martin et al. 2010). Drug injecting history, in addition to chained smoking and being a binge drinker or a former drinker were behavioural factors linked to HIV prevalence (Razak et al. 2003; Srirak et al. 2005). Along with the frequency of injection and injection equipment sharing (Martin et al. 2010), history of sexual abuse, and selling sex (Srirak et al. 2005) were also risk factors for incidence of HIV among users.

5. Risks of HIV/STIs and Alcohol

The social acceptance of alcohol consumption among the general Thai population is reasonably high. It is a common practice to serve alcohol at social functions, such as wedding ceremonies, where adolescents and young adults can drink with no fear of adults' reproof. This, along with its fairly cheap cost and availability at almost every grocery stores and other types of shops, makes the psychoactive drink easily accessible by the majority of adolescents and young adults. Parental socioeconomic status, such as education, religiosity, occupation, etc., are highly linked to substance use among both the parents and their offspring. Adolescents of alcoholic parents are more likely to drink than their counterparts of non-alcoholic parents (Ainette 2010). Despite its association with sexual risk behaviour, alcohol represents the most consumed substance across all age groups in Thailand,

including the adolescents and young adults (Lee & Oberdorfer 2009).

Furthermore, evidence has strongly shown an association between alcohol use and other illicit substance use, which further exacerbates the prevalence of sexual risk behaviours among adolescents and young adults. While data from both Thailand national household surveys and school-based surveys showed that the prevalence of alcohol use in the male is more than twice the prevalence in female (Assanangkornchai et al. 2010; Pengpid & Peltzer 2012), an independent cross-sectional survey among high school and vocational college adolescents reported similar findings (Assanangkornchai et al. 2009). This high prevalence indicates that the sexual risk behaviours are more pervasive in male than female adolescents, thereby increasing their odds of infection. However, in spite of the underlined risk in men than in women, alcohol arguably protects men, who are more likely to engage in sex when drunk, against STI but increases the odds of infection for women (Latimore et al. 2014). Such evidence is subject to further investigations as it contradicts the majority of evidence in alcohol-related studies.

6. Gender Difference and Risks of HIV/STIs among Drug Users

The risk of HIV/STI is not evenly distributed across gender because factors such as drug preference, routes of use and risky behaviours leading to infections are considerably different between both sexes. Inconsistent condom use and casual sex (Latimore et al. 2014; Sutcliffe & Sherman 2010) were more predominant among female adolescents, perhaps this partly explains why adolescent women are at five times greater risk of HIV infection than their male counterparts (UNAIDS/UNICEF 2015). Along with the higher number of multiple sexual partners, which is strongly linked to drug use (German et al. 2008; Sherman et al. 2009; Kasner et al. 2013) and a risk factor for Hepatitis B Virus (HBV) and HIV (Celentano et al. 2008), decreased age at first sexual debut, and accumulated years of sexual partners are more common among male (Latimore et al. 2014). Furthermore, the consequences of alcohol use are more impactful on female than male. For example, except for having sex and unprotected sex, a significant interaction between gender and drinking-smoking status affect all health risk behaviours. On one hand, alcohol and tobacco are strongly associated with illicit substance use in male than female, while, on the other hand, a stronger association with drinking-smoking and fighting, depression, and suicidal thoughts are more common in female than male (Saingam et al. 2012). Regardless of gender, being a binge drinker or a former drinker, in addition to chained smoking, is also linked to HIV risk.

Moreover, rarely are women the priority in drug-related surveys, which inadvertently leads to the dearth of evidence to comprehensively understand the pattern of drug use among them. Therefore, the trend of their injecting practices is still an area of untapped knowledge. However, only a handful of countries reported a 4% higher prevalence of HIV among injecting drug women than among injecting drug men of the same country (UNEP 2014). This shows that female adolescents might arguably be at a higher risk of drug use and consequently a greater risk of HIV/STI than their male counterpart due to a host of factors such as less frequent condom use when having sex with regular partners as earlier stated. Although the vast majority of evidence argue that male adolescents are at much greater risk (Ford & Watkins 2012; Murphey et al. 2013), females show a higher level of substance use in early adolescence, while males exhibit greater changes overtime and higher levels of use in mid-adolescence and early adulthood (Chen & Jacobson 2012).

As part of the government efforts to curbe the use of drugs in Thailand, incarceration has been used among other punishments for both users and dealers. However, incarceration and drunkenness (Latimore et al. 2014; Martin et al. 2010; Kasner et al. 2013) are associated with increased risk of HIV/STIs among male adolescents. It has recently become clear that drug use and sex working are not mutually exclusive. The interaction between them has increased the risks of both drug use and HIV infection among women. For instance, being an injecting drug woman increases the odds of sex work, and being a sex worker conversely increases the odds of injecting drugs. A female sex worker who injects drugs has a twenty times more odds of HIV than a sex worker who does not inject drugs (UNEP 2014). This underlines the increased risk of HIV/STIs associated with injecting and non-injecting drugs and having sex with female sex workers (Rangsin et al. 2015).

7. Conclusion

Overall, the burden of HIV/STI and the health risk behaviours that precede infections are to a large extent shouldered by adolescents and young adults, and thereby are the most affected population. As seen in the majority of the literature, several sexually transmitted infections, such as Chlamydia, Gonorrhoea, Syphilis, HIV, Hepatitis B Virus (HBV), Herpes Simplex Virus (HSV), were tested among both injecting and non-injecting drug users; of those, Chlamydia was the most prevalent while HIV was the least. However, HSV and Chlamydia were more predominant among women while HBV was more among men. This suggests, therefore, that while policymakers work on developing new policies that could eventually mitigate drug use among the adolescent and the general population, intervention treatment to the already affected citizens should also be strengthened so that further infections are averted. Worthy of note is the fact that the nature and type of infections differ between the sexes. Therefore, given that the number of people affected by one infection is higher in one sex than the other,

treatment directed at one sex might have a greater impact than the other.

In addition, the inability of most public health programs to incorporate this fragile population (Zaman & Frances 2009) could partly be responsible for the stability in the increase in new HIV/STI infections among adolescents globally over the recent past. This calls for further scale-up of public health programs reaching this key population. Injecting equipment such as sterile needles, for example, should be made not only available but also accessible to the injecting drug users. Often times the discriminatory comments the drug users receive from both health workers and other care-seeking individuals prohibit them from accessing healthcare facilities. What is more, is that it harms or entirely erode their confidence in the whole health system and the consequences are equivocal. The government should do more to achieve the zero tolerance for discrimination for HIV and it's like for better service delivery. New interventions to include adolescents and young adult drug users should be amplified and the current ones strengthened to further reduce the vulnerability of this teeming youth from HIV/STI and thereby improving their sexual and reproductive health.

Furthermore, the dearth of rehabilitation centres and the ineffectiveness of the few existing ones are to a great extent adding to the burning flame of drug use. Availability and adequacy of rehabilitation services for drug users are central to curtailing the menace. It, among other things, helps to reinstall in them their social values, regain their psychological balance, become more aware of their potentials, talents and skills, and ultimately attain a stable mental health status. This is essential for fostering quick reintegration into their communities so that they become more useful and productive to themselves, their families, and to a large extent, their immediate communities.

Conclusively, several effective ways that could help adolescent live a drug-free life have been suggested. For example, reducing access to substances such as tobacco and alcohol at home, strong positive connection with parents and other family members (Murphey et al. 2013), religious and school programs (Murphey et al. 2013; Miri et al. 2011; Surya & Husada 2013) would help reduce the burden of narcotics and other illicit drug use among adolescents.

REFERENCES

- Ainette, M.G., 2010. Role of family structure and process on adolescent substance use: A test of mediated effects. *Dissertation Abstracts International, B: Sciences and Engineering*, p.591. Available at: https://www.lib.uwo.ca/cgi-bin/ezpauthn.cgi?url=http://search.proquest.com/docview/1018352668?accountid=15115%5Cnhttp://vr2pk9sx9w.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rft_id=info:sid/Sociological+Abstracts&rft_val_f.
- Assanangkornchai, S. et al., 2010. Patterns of alcohol consumption in the Thai population: Results of the National Household Survey of 2007. *Alcohol and Alcoholism*, 45(3), pp.278–285.
- Assanangkornchai, S., Mukthong, A. & Intanont, T., 2009. Prevalence and patterns of alcohol consumption and health-risk behaviors among high school students in Thailand. *Alcoholism: Clinical and Experimental Research*, 33(12), pp.2037–2046.
- Badalà, F., Nouri-mahdavi, K. & Raouf, D.A., 2008. A Meta-Analysis of the Efficacy of HIV/AIDS Prevention Interventions in Asia, 1995–2009. *Computer*, 144(5), pp.724–732.
- Barclay, K. et al., 2016. Birth order and hospitalization for alcohol and narcotics use in Sweden. *Drug and Alcohol Dependence*, 167, pp.15–22. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0376871616301776>.
- Barth, R.J., 2011. Prescription Narcotics : An Obstacle to Maximum Medical Improvement. , (April).
- Bates, C.D., 2015. Harms or highs? Regulating narcotics, alcohol and nicotine. *Politique Internationale*, September(Special Issue: Public health and tax policy), pp.47–60. Available at: <http://clivebates.com/documents/HarmsOrHighsPI.pdf>.
- Celentano, D.D. et al., 2008. Associations of Substance Abuse and Sexual Risks with Self-Reported Depressive Symptoms in Young Adults in Northern Thailand. *Journal of Addiction Medicine*, 2(2), pp.66–73. Available at: http://content.wkhealth.com/linkback/openurl?sid=WKP_TLP:landingpage&an=01271255-200806000-00002.
- Chen, P. & Jacobson, K., 2012. Developmental trajectories of substance use from early adolescence to young adulthood: Gender and racial/ethnic differences. *Journal of Adolescent Health*, 50(2), pp.154–163.
- Chomchai, C., Chomchai, S. & Kitsommart, R., 2016. Transfer of methamphetamine (MA) into breast milk and urine of postpartum women who smoked MA tablets during pregnancy: implications for initiation of breastfeeding. *Journal of human lactation: official journal of International Lactation Consultant Association*, 32(2), pp.333–9. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/26452730>.
- Couture, M.-C. et al., 2011. Young Women Engaged in Sex Work in Phnom Penh, Cambodia, Have High Incidence of HIV and Sexually Transmitted Infections, and Amphetamine-Type Stimulant Use: New Challenges to HIV Prevention and Risk. *Sexually Transmitted Diseases*, 38(1), pp.33–39. Available at:

- <http://content.wkhealth.com/linkback/openurl?sid=WKPTLP:landingpage&an=00007435-201101000-00007>.
- DiMiceli, L.E. et al., 2016. Methamphetamine use is associated with high levels of depressive symptoms in adolescents and young adults in Rural Chiang Mai Province, Thailand. *BMC Public Health*, 16(1), p.168. Available at: <http://www.biomedcentral.com/1471-2458/16/168>.
- Fallis, A., 2013. Thailand Ending Aids. *Journal of Chemical Information and Modeling*, 53(9), pp.1689–1699.
- Ford, J. & Watkins, W., 2012. Adolescent Nonmedical Prescription Drug Use. *Prevention Researcher*, 19(February), pp.3–7.
- Gardner, T.J. & Anderson, T.M., 2011. Criminal Law. , 45, p.560.
- German, D. et al., 2008. Young Thai women who use methamphetamine: Intersection of sexual partnerships, drug use, and social networks. *International Journal of Drug Policy*, 19(2), pp.122–129.
- German D, Sherman SG, Latkin CA, Sirirojn B, Thomson N, Sutcliffe CG, Aramrattana A, C.D., 2009. Young Thai women who use methamphetamine: intersection of sexual partnerships, drug use, and social networks. *Int J Drug Policy*, 19(2), pp.122–129.
- Das Gupta, M. et al., 2014. State of World Population 2014 The Power of 1,8 billion Adolescents, Youth and the Transformation of the Future. *Unfpa*, p.136.
- Kasner, E. et al., 2013. NIH Public Access. , 70(4), pp.646–656.
- Lasco, G., 2014. Pampagilas: Methamphetamine in the everyday economic lives of underclass male youths in a Philippine port. *International Journal of Drug Policy*, 25(4), pp.783–788. Available at: <http://dx.doi.org/10.1016/j.drugpo.2014.06.011>.
- Latimore, A.D. et al., 2014. Specific Interventions. , 40(3), pp.216–220.
- Lee, B. & Oberdorfer, P., 2009. Risk-Taking Behaviors Among Vertically HIV-Infected Adolescents in Northern Thailand. *Journal of the International Association of Physicians in AIDS Care*, 8(4), pp.221–228. Available at: <http://journals.sagepub.com/doi/10.1177/1545109709341082>.
- Martin, M. et al., 2010. Drug use and the risk of HIV infection amongst injection drug users participating in an HIV vaccine trial in Bangkok, 1999-2003. *International Journal of Drug Policy*, 21(4), pp.296–301.
- Melbye, K. et al., 2002. Lifetime correlates associated with amphetamine use among northern Thai men attending STD and HIV anonymous test sites. *Drug and Alcohol Dependence*, 68(3), pp.245–253.
- Miri, M. et al., 2011. The relationship between religiosity and demography factors with narcotics abuse in university student. *Procedia - Social and Behavioral Sciences*, 15, pp.877–881. Available at: <http://dx.doi.org/10.1016/j.sbspro.2011.03.203>.
- Murphey, D. et al., 2013. Adolescent Health Highlight : Use of Illicit Drugs. , (September).
- Orlin Todorov, Elena Psederska, and A.M., 2016. Ten years of psychological research on heroin addiction and related problems at New Bulgarian University : an Overview. , (August).
- Pengpid, S. & Peltzer, K., 2012. Alcohol use and associated factors among adolescent students in Thailand. *The West Indian medical journal*, 61(9), pp.890–896.
- Phupong, V. & Darojn, D., 2007. Amphetamine abuse in pregnancy: The impact on obstetric outcome. *Archives of Gynecology and Obstetrics*, 276(2), pp.167–170.
- Rangsin, R. et al., 2015. Risk factors for HIV infection among young Thai men during 2005-2009. *PLoS ONE*, 10(8), pp.1–12.
- Razak, M.H. et al., 2003. HIV prevalence and risks among injection and noninjection drug users in northern Thailand: Need for comprehensive HIV prevention programs. *Journal of Acquired Immune Deficiency Syndromes*, 33(2), pp.259–266. Available at: <http://www.scopus.com/inward/record.url?eid=2-s2.0-0038417161&partnerID=40&md5=af59666456ec11216517dbced1672567>.
- Saingam, D., Assanangkornchai, S. & Geater, A.F., 2012. Drinking-smoking status and health risk behaviors among high school students in Thailand. *Journal of Drug Education*, 42(2), pp.177–193. Available at: <http://baywood.metapress.com/app/home/contribution.asp?referrer=parent&backto=issue,4,7%5Cjournal,1,166%5Cnlinkingpublicationresults,1:300320,1>.
- Schleifer, R., Kaplan, K. & Suwannawong, P., 2008. Deadly denial: barriers to HIV/AIDS treatment for people who use drugs in Thailand. *XVII International AIDS Conference. 3-8 August 2008, Mexico City, Mexico*, 19(17).
- Sherman, S.G. et al., 2009. Patterns of Risky Behaviors Associated with Methamphetamine Use Among Young Thai Adults: A Latent Class Analysis. *Journal of Adolescent Health*, 44(2), pp.169–175. Available at: <http://dx.doi.org/10.1016/j.jadohealth.2008.06.021>.
- Srirak, N. et al., 2005. HIV infection among female drug users in Northern Thailand. *Drug and Alcohol Dependence*, 78(2), pp.141–145.
- Surya, S. & Husada, M., 2013. Correlation Between Adolescents' Knowledge on Drugs Hazard and Their Behavior in Drug Abuse in Tulungagung. , (Fatia 2005).
- Sutcliffe, C. & Sherman, S.G., 2010. NIH Public Access. , 68(1), pp.69–79.

- Svensson, L., 2013. Knowledge of and attitudes to sexually transmitted diseases among Thai university students.
- Tipwareerom, W. et al., 2011. Effectiveness of a model of risky sexual behavior prevention among adolescent boys in Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health*, 42(3), pp.726–736.
- Unaid, 2017. Unaid's Data 2017. Available at: http://www.unaids.org/sites/default/files/media_asset/20170720_Data_book_2017_en.pdf.
- UNAIDS/UNICEF, 2015. All In to #EndAdolescentAIDS. , p.95.
- UNEP, 2014. The Emissions Gap Report 2014: A UNEP synthesis Report. *Unep*, p.88. Available at: <http://www.unep.org/pdf/SEI.pdf>.
- Willard, N. et al., 2015. Coalition formation to address structural determinants of methamphetamine use in Thailand. *Health Promotion International*, 30(3), pp.782–792.
- Windle, J., 2015. Drugs and drug policy in Thailand. *Foreign Policy at Brookings*, pp.1–16.
- World Health Organisation, 2014. Global status report on alcohol and health 2014. *Global status report on alcohol*, pp.1–392. Available at: http://www.who.int/substance_abuse/publications/global_alcohol_report/msbgsruprofiles.pdf.
- Zaman, W. & Frances, M., 2009. *Improving Access of Young People to Education and Services for Sexual and Reproductive Health, HIV and Gender: Promising Practices in Indonesia, Thailand and Vietnam*, Available at: http://www.icomp.org.my/pub/improve_access.pdf.