

# Drug Use, Increasing Incarceration Rates, and Prison-Associated HIV Risks in Thailand

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**Background:** Incarceration is a known risk for HIV infection in Thai drug users. Through the 1990s, incarceration rates for drug-related offenses rose sharply, whereas HIV prevention and drug treatment in prisons remained limited. **Methods:** We assessed HIV and incarceration risks for injection drug users (IDU) and non-IDU in a large treatment center cohort in northern Thailand to investigate HIV and prison risks in this period. We used Thai Bureau of Corrections data to assess incarceration and prevention funds in prisons, 1992–2000. **Results:** Among 1,865 drug user in the treatment cohort, 503 (27.0%) had ever been jailed. Men (OR 3.3, 95% CI 2.1, 5.2), IDU (OR 6.3, 95% CI 5.1, 7.9), and men who have sex with men (MSM) (OR 3.4, 95% CI 1.8, 6.3) were more likely to have been jailed. Among male IDU who had ever been jailed ( $N = 272$ ), 15.8% had used drugs in prison. In a multivariate model, incarceration and ever IDU remained independently associated with HIV infection; IDU, MSM behaviors, and harmful traditional practices remained independently associated with having been jailed. From 1992 to 2000, overall alleged narcotics offenses increased from 117,000 to 276,000/year. The number of persons incarcerated for narcotics offenses increased fivefold from 1992 to 1999, from 12,860 to 67,440. For FY 2000, narcotics treatment accounted for 0.06% of the Thai corrections budget, whereas HIV programs in prisons were 0.017%. **Conclusions:** Incarceration rates for narcotics offenses have increased sharply in Thailand, whereas prevention has lagged. Having been jailed is an important independent risk for HIV infection among Thai male drug users, especially IDU and MSM. HIV prevention and drug treatment are urgently needed in Thai prisons.

**KEY WORDS:** Incarceration; HIV risks; injecting drug users; Thailand.

## INTRODUCTION

Thailand's response to the HIV/AIDS epidemic has often been cited as a model of success in HIV pre-

vention, multisectorial collaboration, and evidence-based decision making. However, the response has had some important limitations (Ainsworth *et al.*, 2000). HIV infection rates among Thai sentinel populations including soldiers, pregnant women, and sexually transmitted disease (STD) clinic attendees, have fallen significantly since 1995–1996. (Ministry of Public Health, Thailand, 2000). Among Thai injecting drug users (IDU), however, HIV rates have not shown similar declines (Figure 1). HIV incidence densities in prospective cohorts in Bangkok and Chiang Mai have remained high and steady through 2001, in the range of 4–10/100 person years. (Celentano *et al.*, 1999; Vanichseni *et al.*, 2001) HIV prevention for IDU

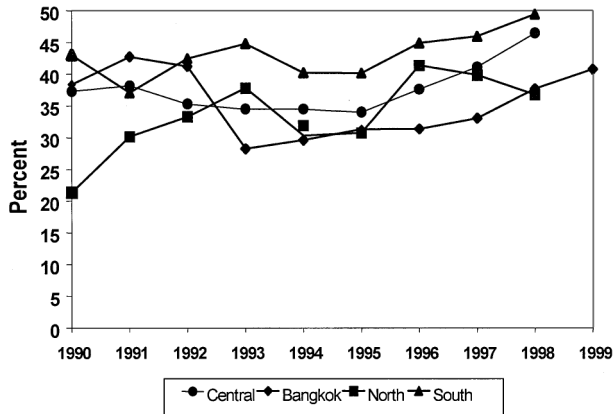
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**Fig. 1.** Percentage of injecting drug users (IDU) infected with HIV by region, 1990–1999.

and drug treatment programs generally have been limited by Thai policy and law (Crofts *et al.*, 1998) It is this arena where evidence-based decision making has been infrequently used. HIV prevention programs for IDU appear to have remained even more limited in the Thai prison system.

Incarceration has been known to be a risk factor for HIV infection among injecting drug users in Thailand for over a decade, (Choopanya *et al.*, 1991, 2002; Kitayaporn *et al.*, 1998). Indeed, the first epidemic outbreak of HIV in the country likely began among IDU in the Bangkok prison system in 1988 (Wright *et al.*, 1994). The first risk assessment, reported by Choopanya and colleagues, among a large cohort of Bangkok IDU found only two risk factors to be independently associated with HIV infection: having shared needles with two or more individuals in the previous 6 months and having been in prison (Choopanya *et al.*, 1991). Controlling for all other risks, Bangkok IDU with a history of prison were about twice as likely to be HIV-infected as those who had never been jailed ( $p < .001$ ) In terms of absolute risks, 70% of all IDU in this study had been incarcerated at least once, and 80% of all those with HIV infection had ever been jailed. (Choopanya *et al.*, 1991). Later studies by other groups have confirmed this ongoing association, including one recent report of HIV infection rates *during* incarceration, measured at 35/100 person-years at risk (95% CI 21.2, 55.2) among jailed Bangkok IDU (Choopanya *et al.*, 2002). This is strong evidence of a causal relationship between incident HIV infection and incarceration.

Several factors may be important in the association of HIV, incarceration, and drug use in many countries where IDU is found, including Thailand. First,

there is some evidence that heroin and other illicit narcotics are available in some Thai correctional facilities (Choopanya *et al.*, 2002). Although drugs may be available, access to sterile injection equipment is extremely limited (Ainsworth *et al.*, 2000). In addition, drug treatment programs for jailed opiate-dependent drug users are limited, and long-term drug substitution therapy, with methadone or other noninjectables, has long been prohibited by Thai law (Vanichseni *et al.*, 1991). Methadone taper regimens are widely used, but these limit methadone provision to 45 days, which is inadequate for many opiate-addicted drug users (Juttiwitikarn *et al.*, 2000). Harm reduction, both for incarcerated IDU and for drug users outside the corrections system, has been limited to fewer than five demonstration projects in the country, and there has been only one documented attempt to establish a needle and syringe exchange program at the community level (Gray, 1995, 1998). Sexual risks involving male inmates and staff, or between female inmates and male staff, may also be HIV risks, and may be primary HIV risks for prisoners who do not inject. Condom availability is extremely limited in Thai correctional facilities (Ainsworth *et al.*, 2000). Traditional practices, including tattooing and insertion of penile implants (*Fang Muk* in Thai<sup>6</sup>) are common among Thai male prison populations and may increase HIV, hepatitis C virus, and hepatitis B virus acquisition and transmission risks.

Thailand has experienced a rapid increase in drug availability, use, and related social harms through the 1990s (Ainsworth *et al.*, 2000). Much of this increase has been attributable to an epidemic of methamphetamine use or use of amphetamine-type stimulants use, fueled by a sharp rise in ATS production in Burma (Khuenkaew, 1997). An estimated 2 million Thais were thought to use ATS with some frequency 1999, in a population of 60 million (Daorueng, 1999). Thai government responses to this rising drug use trend have varied, but increasing incarceration appears to have been among the most significant.

We analyzed three data sets to investigate the relationship of incarceration to the ongoing epidemic of HIV among Thai drug users. These include incarceration risks and HIV and incarceration associations among a large drug treatment center population in

<sup>6</sup>*Fang Muk*, penile implants, are a traditional practice in Thai culture. Small objects, commonly pearls, glass beads, or jade pieces, are inserted under the skin of the penis through small incisions, usually in the foreskin, which are then sutured closed. The implants are thought by Thais to enhance female sexual stimulation.

northern Thailand (the Opiate Users Research cohort study); data on incarceration for narcotics-related offenses, 1992–2000, from the Thai Bureau of Corrections; and expenditure data for drug treatment and HIV/AIDS programs in the Thai prison system in 1999–2000 from the National Economic and Social Development Board (NESDB) of the Office of the Prime Minister. Although risks for individual drug users have been previously described, this is the first report, to our knowledge, on the rapid rise in incarceration risks among Thai drug users and of risks for incarceration and HIV among IDU and non-IDU in this period.

## METHODS

### Cohort Study Data

From 1999 and 2000 we conducted a collaborative research project among injecting and non-injecting drugs users admitted for detoxification at a voluntary drug treatment center in Chiang Mai Province, northern Thailand. The collaboration included the Northern Drug Dependence Treatment Center (NDTC) of the Thailand Ministry of Public Health, the Research Institute for Health Sciences (RIHES) of Chiang Mai University, and the Johns Hopkins Bloomberg School of Public Health. The data used here were from the cross-sectional cohort phase of the study, done in preparation for a large preventive intervention trial now under development (HPTN 037; a network-based peer education intervention trial to reduce HIV infections among IDU). Informed consent was obtained from all participants and from guardians of participants under the age of 20 years. Demographic factors, drug use history, sexual history, history of incarceration, drug use in prison, and traditional practices were recorded through face-to-face interviews conducted by trained interviewers in six local languages. Participants provided a serum specimen that was tested for HIV antibody using commercially available reagents. HIV pre- and posttest counseling was provided to all participants.

The data were analyzed using chi-square, Mantel–Haenszel chi-square test for trends, and multiple logistic regression techniques to estimate the unadjusted and adjusted odds ratios (OR) and 95% confidence intervals (CI) associated with incarceration and with HIV risks for men and women. Since the number of women in the study was too small to detect

significant differences if they existed, the logistic regression models included only male participants. The study was reviewed and approved by the human subjects review committees of the Johns Hopkins University, Chiang Mai University, and the Royal Thai Ministry of Public Health.

### Incarceration Data and Expenditures

We analyzed the Thai National Bureau of Corrections data on incarceration from 1992 to 2000. These data were provided to our group by a Thai government official. The data include numbers of persons in detention, prisons, and jails, but not those in juvenile detention facilities. Periods of incarceration were not available, and the rates are presented as mid-year intervals. Injection status was not available. The category “possession” implies sentences for amounts too small to be considered drug trading or sales, and includes the bulk of persons jailed for drug use alone. In 1999–2001 the amount of ATS considered for “possession” only has fallen three times as narcotics laws have tightened, so this category has changed somewhat over the years for which data were analyzed. Budget data were provided by the National Economic and Social Development Board (NESDB) of Thailand and include data on prison expenditures in the health sector as well as overall corrections allocations. These data are released annually as part of the Thai National Budget. All prisons in Thailand are federal and financed by the central government.

## RESULTS

### Cohort Findings

A total of 2,149 drug users were found to be eligible for enrollment in the study. Of these, 1,865, or 87%, agreed to enroll. Of these, 1,665 were men and 200 were women (Table I.) Overall, 192, or 10.3%, of the 1,865 participants were HIV infected; the prevalence was 30.0% among 513 patients who gave a lifetime history of injection and 2.8% among 1,352 patients who reported never having injected drugs. The population was 55% Thai ethnicity and 45% ethnic minority individuals (commonly called hill tribes) from the Hmong, Karen, Akha, Shan, and other groups. Noninjectors were the majority, accounting for 72.5% of the total cohort, whereas 27.5% had a lifetime history of IDU behavior.

**Table I.** Sociodemographic Characteristics and Prison History Among All Participants Admitted to Northern Drug Dependence Treatment Center, Thailand, 1999–2000

	No. tested	No. ever in jail/prison (%)	OR (95% CI)
Total	1865	503 (27.0)	
Gender			
Male	1665	481 (28.9)	3.29 (2.08, 5.18)
Female	200	22 (11.0)	1.0
Age (years)			
<20	426	68 (16.0)	1.0
20–39	1017	333 (32.7)	2.56 (1.92, 3.43)
≥40	422	102 (24.2)	1.68 (1.19, 2.36)
Ethnicity			
Hill tribe	839	208 (24.8)	1.0
Thai	1026	295 (28.8)	1.22 (1.00, 1.51)
Injection drug use			
Ever	513	283 (55.2)	6.33 (5.05, 7.94)
Never	1352	220 (16.3)	1.0
MSM			
Ever	42	24 (57.1)	3.40 (1.83, 6.33)
Never	1623	457 (28.2)	1.0
Education			
None	638	144 (22.6)	1.0
≥Compulsory	1227	359 (29.3)	1.42 (1.14, 1.77)
Occupation			
Student	238	38 (16.0)	1.0
Farmer	767	189 (24.6)	1.72 (1.17, 2.53)
Laborer/hiring for general job	273	104 (38.1)	3.24 (2.12, 4.95)
Trader	99	36 (36.4)	3.01 (1.76, 5.14)
Unemployed	348	100 (28.7)	2.12 (1.40, 3.22)
Other	140	36 (25.7)	1.82 (1.09, 3.05)
Marital status			
Married	804	191 (23.8)	1.0
Never married	806	217 (26.9)	1.18 (0.94, 1.48)
Other	255	95 (37.3)	1.91 (1.41, 2.58)

### Factors Associated with Lifetime Incarceration History for Men

A lifetime history of incarceration was common, with 503 of 1,865 drug users, 27.0%, reporting ever having been jailed. Among the men, 481, or 28.9%, had a history of incarceration, whereas 22 women, 11%, had been in prison. Ethnic Thai participants were somewhat more likely than ethnic minority group members to report having been jailed, with 28.8% of Thais and 24.8% of minority participants reporting (OR 1.2, 95% CI 1.0, 1.5). This difference was likely confounded by injection status, which was much more common among Thai drug user (data not shown). Sociodemographic factors associated with incarceration included being male (OR 3.3, 95% CI 2.1, 5.2), having been an IDU (OR 6.3, 95% CI 5.1, 7.9), and reporting of any lifetime same-sex behavior among men (OR 3.4, 95% CI 1.8, 6.3). (Table I). Age

over 20 years and several low-paying occupations, including being a laborer and being unemployed, were also associated with a history of incarceration in univariate analyses.

### Factors Associated with Lifetime Incarceration History for Women

A total of 200 women drug users participated in the study, of whom 14, or 7%, were HIV infected, and 186 were HIV-negative. Among these 200 women, 22 reported a lifetime history of incarceration. Among the 178 who had never been incarcerated, 9, or 5.1%, were HIV-positive, whereas among the 22 who had been jailed, 5, or 22.7%, were HIV-positive, a significantly higher rate (OR 5.5, 95% CI 1.7, 18.4). The majority of these women drug users, 86%, were non-IDU. For both women IDU and women non-IDU, the association between prison history and HIV appeared to persist, but did attain statistical significance, largely due to sample size.

### Traditional Practices and Incarceration

Several practices with potential blood exposures were strongly associated with a history of incarceration among the men in the study. These included having had a tattoo (OR 2.6, 95% CI 2.1, 3.3), having donated or sold blood (OR 1.7, 95% CI 1.3, 2.2) and having had a penile implant, *Fang Muk* (OR 5.6, 95% CI 3.6, 8.7). Among men incarcerated in the year before enrollment, tattoos (OR 7.6, 95% CI 4.6, 12.4) and *Fang Muk* (OR 6.7, 95% CI 2.6, 17.7) were even more strongly associated with prison. Overall, 94 men reported having a penile implant, and of these, 63, or 67%, had a prison history (Table II).

### Risks Among Incarcerated IDU

Among men who had been incarcerated, stratified by injection history (ever injected any drug versus never injected), demographic variables associated with incarceration did not differ by injection status, except that IDU were more likely to report same-sex behavior than were non-IDU. Traditional practices were much more common among IDU than non-IDU, with 13.6% of male IDU having *Fang Muk* and only 2.4% of non-IDU reporting these implants, but they remained strongly associated with incarceration in both groups.

**Table II.** History of Tattoos, Fang Muk, or Blood Donation and History of Incarceration Among All Males Admitted to the Northern Drug Dependence Treatment Center, Thailand, 1999–2000

Characteristics	No. tested (column %)	Ever incarcerated		OR (95% CI)
		No <i>n</i>	Yes <i>n</i> (row%)	
Ever tattooed in lifetime				
No	1221 (73.3)	937	284 (23.3)	1
Yes	444 (26.7)	247	197 (44.4)	2.63 (2.09, 3.31)
Ever Fang Muk in lifetime				
No	1571 (94.4)	1153	418 (26.6)	1
Yes	94 (5.6)	31	63 (67.0)	5.61 (3.59, 8.74)
Ever donated blood in lifetime				
No	1363 (81.9)	997	366 (26.9)	1
Yes	302 (18.1)	187	115 (38.1)	1.68 (1.29, 2.18)
		Incarcerated past year		
	No. tested (column %)	No <i>n</i>	Yes <i>n</i> (row%)	OR (95% CI)
Tattooed in past year				
No	1589 (95.4)	1469	120 (7.6)	1
Yes	76 (4.6)	47	29 (38.2)	7.55 (4.59, 12.44)
Fang Muk in past year				
No	1647 (98.9)	1505	142 (8.6)	1
Yes	18 (1.1)	11	7 (38.9)	6.74 (2.57, 17.67)
Donated blood in past year				
No	1626 (97.7)	1481	145 (8.9)	1
Yes	39 (2.3)	35	4 (10.3)	1.17 (0.41, 3.33)

Since male IDU appeared to be at greatest risk for both incarceration and HIV infection, we did a subset analysis of the 485 men with an IDU history, of whom 272, or 56%, had ever been jailed (Table III). Among these men incarceration was strongly associated with HIV infection; 104, or 38.2%, of IDU who had been in jail were HIV-infected, whereas 43, or 20.2%, of those who had never been jailed were infected (OR 2.5, 95% CI 1.6, 3.7). Of the 272 who had

been jailed, 43, or 15.8%, reported having used drugs while in prison, and 48.8% of these men had HIV infection (Table III). A lifetime history of having used drugs in prison was associated with HIV infection, OR 1.68, but due to small sample size this did not achieve statistical significance.

For all men, IDU and non-IDU, there were 178 HIV-infected participants, of whom 111, or 62.4%, had a positive incarceration history.

**Table III.** Prison History and HIV Seroprevalence Among Male Injectors Admitted to the Northern Drug Dependence Treatment Center, Thailand, 1999–2000<sup>a</sup>

	No. tested	No. HIV+ (%)	OR (95% CI)
<i>Among all male IDU (N = 485)</i>			
Jail/prison in lifetime			
Ever	272	104 (38.2)	2.45 (1.62, 3.70)
Never	213	43 (20.2)	1.0
Jail/prison in past year			
Yes	78	29 (37.2)	1.45 (0.87, 2.41)
No	407	118 (29.0)	1.0
<i>Among male IDU ever incarcerated (N = 272)</i>			
Used drugs in jail/prison in lifetime			
Ever	43	21 (48.8)	1.68 (0.87, 3.24)
Never	229	83 (36.2)	1.0
Used drugs in jail/prison in past year			
Yes	12	4 (33.3)	0.80 (0.23, 2.73)
No	260	100 (38.5)	1.0

<sup>a</sup>Injectors = person reports ever having injected drugs in his lifetime.

Drug users with no history of injection were the majority in our study, with most reporting ATS use, opium or heroin smoking/ingestion, or inhalant use. Among this large and diverse group of 1,352 men and women, 220, or 16.3%, reported an incarceration history. The overall HIV prevalence in this group was low compared to IDU. HIV infections were more common among those who had been jailed, 3.6% versus 2.3% among those never jailed, but the difference was not statistically significant.

### Multivariate Risks for Incarceration

In a multivariate model among male drug users, controlling for age, occupation, ethnicity, drug history, and same-sex behavior, a history of injecting, same-sex behavior, and harmful traditional practices remained independently associated with having been jailed (Table IV).

### Multivariate Risks for HIV Infection

In a multivariate model among male drug users controlling for age, injection status, occupation, ethnicity, and same-sex behavior, a history of incarceration and ever having been an IDU remained independently associated with HIV infection (Table V). Traditional practices did not remain independently associated with HIV infection in this model.

**Table IV.** Adjusted Odds Ratios for Ever Being Incarcerated Among 1,665 Males Admitted to the Northern Drug Dependence Treatment Center, Thailand, 1999–2000<sup>a</sup>

Characteristics	Adjusted	OR (95% CI)
<b>Ever IDU</b>	<b>4.33</b>	<b>(3.34, 5.62)</b>
<b>Ever MSM</b>	<b>2.43</b>	<b>(1.18, 5.00)</b>
<b>Ever Fang Muk in lifetime</b>	<b>2.49</b>	<b>(1.52, 4.09)</b>
<b>Ever tattooed in lifetime</b>	<b>1.77</b>	<b>(1.35, 2.31)</b>
Ever donated blood in lifetime	1.32	(0.96, 1.81)
Ethnicity: Thai citizen	0.82	(0.55, 1.23)
Age 20–39 years	1.19	(0.78, 1.83)
Age ≥40 years	1.13	(0.67, 1.91)
Compulsory education	0.93	(0.62, 1.38)
Never married	1.16	(0.84, 1.61)
<b>Previously married</b>	<b>1.46</b>	<b>(1.01, 2.11)</b>
Farmer	0.99	(0.56, 1.75)
Laborer/hiring for general job	1.50	(0.84, 2.66)
Trader	1.06	(0.53, 2.09)
Unemployed	1.07	(0.65, 1.75)
Other occupation	0.71	(0.37, 1.35)

<sup>a</sup>Reference groups are: never injected drugs in lifetime; never had homosexual sex; never *Fang Muk*; never tattooed; never donated blood; ethnic minority (hill tribe); age < 20 years; no education; married; student.

**Table V.** Adjusted Odds Ratios for HIV Seroprevalence Among 1,665 Males Admitted to the Northern Drug Dependence Treatment Center, Thailand, 1999–2000<sup>a</sup>

Characteristics	Adjusted	OR (95% CI)
<b>Ever incarcerated and never used drugs in jail/prison in lifetime</b>	<b>1.77</b>	<b>(1.19, 2.64)</b>
<b>Ever incarcerated and ever used drugs in jail/prison in lifetime</b>	<b>2.68</b>	<b>(1.30, 5.51)</b>
<b>Ever IDU</b>	<b>8.17</b>	<b>(5.19, 12.86)</b>
Ever MSM	1.18	(0.49, 2.86)
Ever fang muk in lifetime	1.22	(0.71, 2.12)
Ever tattooed in lifetime	1.16	(0.78, 1.74)
Ever donated blood in lifetime	0.87	(0.56, 1.34)
Ethnicity: Thai citizen	0.96	(0.55, 1.67)
Age 20–39 years	2.20	(1.02, 4.75)
Age ≥40 years	0.87	(0.33, 2.28)
Compulsory education	2.21	(1.19, 4.11)
Never married	1.57	(0.98, 2.52)
Previously married	2.37	(1.42, 3.98)
Farmer	3.09	(0.96, 9.98)
Laborer/hiring for general job	5.66	(1.78, 18.05)
Trader	5.56	(1.63, 18.93)
Unemployed	1.98	(0.63, 6.20)
Other occupation	2.33	(0.68, 8.02)

<sup>a</sup>Reference groups are: never incarcerated; never injected drugs in lifetime; never had homosexual sex; never *Fang Muk*; never tattooed; never donated blood; ethnic minority (hill tribe); age < 20 years; no education; married; student.

### Incarceration Findings

Figure 2 shows the number of incarcerations in Thailand due to drug sales and drug possession offenses from 1992 to 2000. Overall narcotics charges rose from 116,728 in 1992 to 275,551 in 2000, an increase of over 100%. The number of persons jailed for drug possession and drug use only (not sales) also more than doubled in this time period.

Much of the increase in narcotics charges occurred in 1997–2000. Charges for possession alone more than doubled, from 47,500 to 101,300 from 1992 to 2000. Possession charges were much more common than charges for sale throughout this period; possession accounted for 95% of charges of 1992 and 88.5% of charges in 2000. The number of persons incarcerated for narcotics-related offenses in Thailand increased fivefold from 1992 to 1999, from 12,860 to 67,440 (Figure 3). The population doubled from 1997 to 1999, from 31,354 to 67,440. The year 2000 figures on the prison population were not available at this writing.

### Expenditures

The year 2000 national budget for corrections in Thailand was 5,632,446,933 Baht, roughly

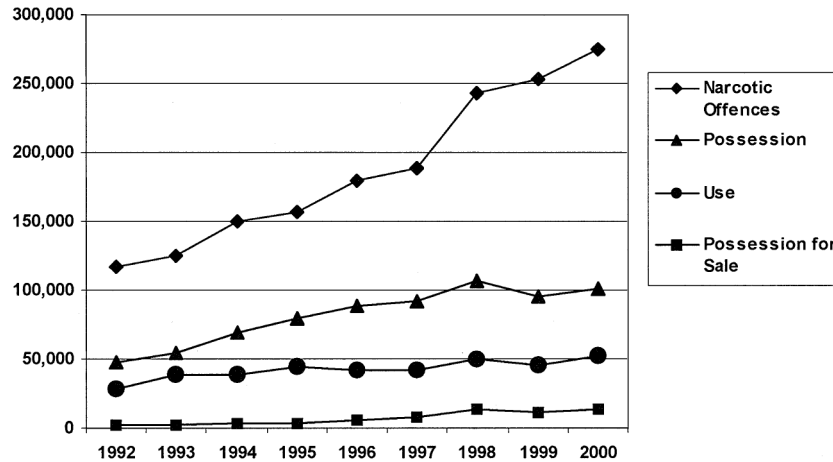


Fig. 2. Narcotics-related offenses in Thailand, 1992–2000.

156.5 million USD, a significant sum.<sup>7</sup> In 1999 and 2000 each, the Bureau of Corrections budget for its narcotics control program was 3,420,000 Baht (about 86,000 USD) and for its HIV/AIDS programs, 955,800 Baht (about 22,000 USD). For year 2000, narcotics treatment accounted for 0.06% of the corrections budget; HIV/AIDS prevention and care was 0.017% of expenditures. These funding levels did not increase from 1999 to 2000, despite the increase in the number of incarcerated drug users.

**DISCUSSION**

Our cohort findings reaffirm the association between incarceration and HIV infection among Thai male and female injecting drug users. Although causality is difficult to determine using cross-sectional methods, the finding that incarceration remained an independent risk for HIV among the men when controlling for sexual, drug use, behavioral, and demographic variables is compelling. That a history of being an injector is associated with being in prison is perhaps to be expected, so is the finding that male drug users who report same-sex behavior are also more likely to have been jailed. What is potentially important is the relative frequency with which injectors report having used drugs while in prison, and the very high rate of reporting of same-sex behavior among jailed male IDU (81.8%). Prison remains a very high risk environment for Thai drug users. The high correlation

with recent incarceration and practices including tattoos and penile implants suggests risks for acquisition for other bloodborne pathogens, including hepatitis C virus, may also be high.

The number of women enrolled in our cohort study ( $N = 200$ ) and who had been jailed ( $N = 11$ ) was too small to allow for detailed analysis of the risks we have investigated among men. Nevertheless, univariate analysis showed that women drug users who had been jailed were more than five times as likely to have HIV infection than women who had never been jailed. This was true for both women with a history of injection and for those who reported never having injected, although our numbers were too small to show significant differences for these subgroups of women. Further research with larger numbers of women into the risks associated with incarceration is thus an important priority.

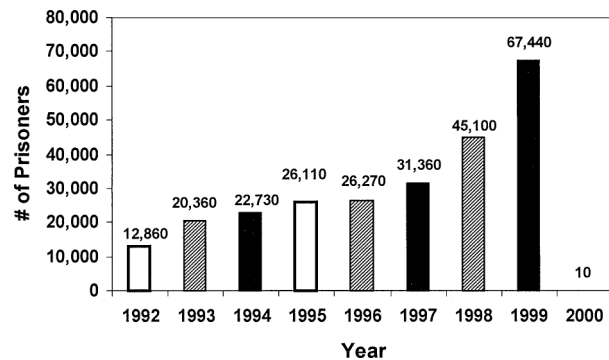


Fig. 3. Prisoners jailed for drug-related offenses in Thailand, 1992–1999.

<sup>7</sup>In 2000 the Thai Baht exchange rate was 40.1 to 1 USD.

The Thai incarceration data describe a decade-long increase in incarceration for narcotics-related offenses and a doubling of the prison narcotics population from 1997 to 1999. Whereas prison remains associated with HIV risk for drug users and the number of drug users in prisons has so markedly increased, the corrections budget for drug treatment and for HIV programs is extremely small. Thailand spent more than 150 million USD on its prison system in 2000, a significant sum for a developing country, but less than 25,000 USD on HIV/AIDS for the entire prison system. These funds were to support both HIV prevention and AIDS care programs for all prisoners, non drug users included. In terms of expenditures per incarcerated drug user, the funds have actually *fallen* as the population has increased.

In addition to funding constraints, Thai policy has also limited prevention and drug treatment programs. Thai jails and detention centers severely limit access to injecting equipment and needle exchange programs are not allowed to operate. This means incarcerated IDU who continue to use are highly likely to share and borrow injection equipment. Needle sterilization approaches, such as boiling and bleach, are also unavailable to these IDU. Our data suggest that drug use is not uncommon in many Thai detention settings, such that IDU can, and do, continue to use, albeit unsafely. Long-term substitution for opiate addiction is not available in the prison system or outside it, except in some research settings. Condom access to prevent sexual spread of HIV infection in prisons is very limited in Thai prisons, and this situation prevails in many settings, including the U.S. prison system. This may be a particular risk setting for young and adolescent drug users, who may be more likely to engage in unwilling and/or forced sex in prison settings. Although Thailand does not have laws against homosexuality, recognition of homosexual sex and the risks of unprotected anal intercourse appears to be limited among Thai prison authorities, and condom promotion efforts on the part of NGOs have met with resistance from corrections authorities.

We have compared data from several different sources: our 1999–2000 cohort study, conducted in northern Thailand; national data on incarceration for the period 1992–1999; and the Thai national budget for HIV and drug treatment in the prison system for 1999–2000. Thus a potential limitation is that it may be difficult to make direct comparisons between risks identified among members of our cohort and the incarceration data over a longer time frame. Nevertheless, since we asked about lifetime history of incar-

ceration, the longer time frame for the incarceration rate data likely does “capture” a significant proportion of relationships between prison policy and the experience of the drug users enrolled in our study. A further potential limitation is that we studied drugs users recruited through drug treatment and not from the unknown but presumably large population of drug users outside treatment. We could speculate that drug users out of treatment might be higher or lower HIV risks than those presenting to detoxification and might have differing incarceration histories. Such possible differences could limit the generalizability of our cohort findings.

One important change in Thai prison policy has been an outcome of the Thailand–VAXGEN HIV vaccine efficacy trial, which is currently being conducted among Bangkok IDU participants. The Thai prison authorities have cooperated in the trial and given investigators access to incarcerated IDU, allowing for continued follow-up and high ethical and medical standards of voluntary testing and counseling, confidentiality, and access to care (Frits van Griensven, personal communication, Bangkok, August 2000). This participation is a potentially important step for future prevention programs in the prisons.

## CONCLUSIONS

HIV prevention and drug treatment programs for prisoners are controversial and difficult to implement. However, Thailand’s long-standing and ongoing epidemic of HIV among drug users and its burgeoning population of persons incarcerated for drug use and possession suggest that this is an important arena for expanding prevention. Intersectorial collaborations between the Ministry of Public Health, which has an impressive record of prevention success with hard-to-reach populations, and the Office of Narcotics Control Board and the Bureau of Corrections could be an important step in improving prison safety and health.

With incarceration and legal- and security-driven approaches in the forefront of Thai drug policy, harm reduction may be politically difficult for Thai decision makers to embrace. However, Thailand’s history of evidence-based decision making and pragmatic approaches to HIV infection are reasons for optimism. Success in HIV prevention for incarcerated IDU could have important implications for this vulnerable population in other countries.



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## REFERENCES

- Ainsworth, M., Soucat, A., and Beyrer, C. (2000). *Thailand's response to AIDS: Building on success, confronting the future. Thailand social monitor V*. Bangkok: World Bank, Thailand Office.
- Celentano, D. D., Hodge, M. J., Razak, M. H., Beyrer, C., Kawichai, S., Cegielski, J. P., Nelson, K. E., and Jittiwutikarn, J. (1999). HIV-1 incidence among opiate users in northern Thailand. *American Journal Epidemiology*, *149*, 558–564.
- Choopanya, K., Des Jarlais, D. C., Vanichseni, S., et al. (2002). Incarceration and risk for HIV infection among injection drug users in Bangkok. *Journal of AIDS*, *29*, 86–94.
- Choopanya, K., Vanichseni, S., Des Jarlais, D. C., Plangsringarm, K., Sonchai, W., Carballo, M., Friedmann, P., and Friedman, S. R. (1991). Risk factors and HIV seropositivity among injecting drug users in Bangkok. *AIDS*, *5*, 1509–1513.
- Crofts, N., Reid, G., and Deany, P. (1998). Injecting drug use and HIV infection in Asia. The Asian Harm Reduction Network. *AIDS*, *12*(Supplement B), S69–S78.
- Daorueng, P. (1999). 'Mad Drug' menace spreads in Thailand. Inter Press Service, November 11, [http://www.oneworld.org/ips2/june1998/08\\_53\\_033.html](http://www.oneworld.org/ips2/june1998/08_53_033.html)
- Gray, J. (1995). Operating needle exchange programmes in the hills of Thailand. *AIDS Care*, *7*, 489–499.
- Gray, J. (1998). Harm reduction in the hills of northern Thailand. *Substance Use and Misuse*, *33*, 1075–1091.
- Jittiwutikarn, J., Sawanpanyalert, P., Rangsiveroj, N., and Satitvipawee, P. (2002). HIV incidence rates among drug users in northern Thailand, 1993–7. *Epidemiology of Infections*, *125*, 153–158.
- Khuenkaew, S. (1997). Traffickers speed up inflow of amphetamine. *Bangkok Post*, November 9, 1997. <http://soros.org/burma/bd110997.html>.
- Kitayaporn, D., Vanichseni, S., Mastro, T. D., Raktham, S., Vaniyapongs, T., Des Jarlais, D. C., Wasi, C., Young, N. L., Sujarita, S., Heyward, W. L., and Esparza, J. (1998). Infection with HIV-1 subtypes B and E in injecting drug users screened for enrollment into a prospective cohort in Bangkok, Thailand. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*, *19*, 289–295.
- Ministry of Public Health, Thailand. (2000). *HIV/AIDS Sentinel Surveillance Report* Bangkok: Author.
- Vanichseni, S., Kitayaporn, D., Mastro, T. D., Mock, P. A., Raktham, S., Des Jarlais, D. C., Sujarita, S., Srisuwanvilai, L. O., Young, N. L., Wasi, C., Subbarao, S., Heyward, W. L., Esparza, L., and Choopanya, K. (2001). Continued high HIV-1 incidence in a vaccine trial preparatory cohort of injection drug users in Bangkok, Thailand. *AIDS*, *15*, 397–405.
- Vanichseni, S., Wondsuwan, B., et al. (1991). A controlled trial of methadone maintenance in a population of IDU in Bangkok: Implications for prevention of HIV. *International Journal of Addictions*, *26*, 1313–1320.
- Wright, N. H., Vanichseni, S., Akarasewi, P., Wasi, C., and Choopanya, K. (1994). Was the 1988 HIV epidemic among Bangkok's injecting drug users a common source outbreak? *AIDS*, *8*, 529–532.