Temporal trends in HIV-1 incidence and risk behaviours in men who have sex with men in Bangkok, Thailand, 2006–13: an observational study

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Summary

Background HIV-1 incidence in men who have sex with men (MSM) is often difficult to estimate. We therefore assessed temporal trends in HIV-1 incidence and behavioural risk factors in MSM in Bangkok, Thailand, from 2006 to 2013.

Methods In this observational study, we used data for clients attending the Silom Community Clinic for voluntary counselling and testing (VCT) services and from the Bangkok MSM Cohort Study (BMCS) to investigate trends in HIV incidence per 100 person-years per quarter in both cohorts. During VCT, basic demographic data were gathered at registration. However, no behavioural risk data were gathered. In the BMCS, we gathered demographic and behavioural data at baseline and at regular study visits using audio computer-assisted self-interviewing. Questions were included about potential risk factors such as drug use, sexual practices, and how often condoms were used. We also analysed behavioural risk factors in the BMCS cohort, using a restricted cubic spline function for time.

Findings From 2006 to 2013, 8176 MSM came for VCT; 1999 (24%) clients were initially seronegative and returned for another test. 235 (12%) individuals seroconverted. The overall HIV-1 incidence was 5·5 per 100 person-years (95% CI 4·8–6·3), with an increasing trend (adjusted p=0·02). In the BMCS, 1372 people were seronegative at baseline; 1259 (92%) had more than one follow-up test and 238 (17%) seroconverted. The overall HIV-1 incidence was 5·3 per 100 person-years (95% CI 4·7–6·1), with an increase and then a decline (inverted U-shaped curve, p=0·0001). Individuals aged 21 years and younger were at significantly higher risk of HIV infection than were those aged 30 years and older in the in the VCT (rate ratio 2·29, 95% CI 1·88–2·78, p<0·0001) and BMCS cohorts (1·99, 1·50–2·65, p<0·0001). Overall, drug use (p=0·03), drug use to enhance sex (p=0·0006), use of drugs for erectile dysfunction (p<0·0001), and 100% condom use (p<0·0001) increased over time, whereas the proportion of individuals reporting receptive anal intercourse decreased (p=0·004).

Interpretation With a sustained high HIV-1 incidence and increasing drug use in MSM in Bangkok, we urgently need innovative and acceptable HIV prevention interventions, especially for young MSM.

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Introduction

After successful control of the HIV-1 epidemic in the heterosexual population in Thailand by the late 1990s,[1,2] concern remained about the continued spread of HIV in other high-risk groups, particularly men who have sex with men (MSM). During April to May, 2003, the first cross-sectional MSM HIV prevalence survey assessment was done in Bangkok, Thailand.[3] Results of the survey showed a largely unrecognised epidemic of HIV in MSM, with a prevalence of 17·3%. The survey was repeated in 2005 and 2007,[4] and was incorporated into the Thai Ministry of Public Health surveillance system with additional assessments in 2009, 2010, and 2012. By 2005, HIV prevalence in MSM had risen to 28·3%, and has remained stable between 25–31% in the subsequent years.[5,6]

Despite surveillance, estimation of the incidence of HIV-1 infection is not easy in the MSM population. In cross-sectional studies, HIV incidence can be estimated for some populations, but not the pattern of the epidemic over time. Cohort studies provide the best estimates of incidence, allow follow-up, and can provide the means to assess the potential effects of prevention and intervention in a population.

The temporal trends in HIV incidence and behavioural risk factors, with the prevalence surveys done since 2003, provide an opportunity to assess the response to the HIV epidemic in MSM in the past decade in Bangkok. We therefore assessed the temporal trends in HIV-1 incidence and key behavioural risk factors, including drug use, receptive anal intercourse, and condom use, from 2006 to 2013 in MSM attending the Silom Community Clinic in Bangkok. We compared data obtained from clients using anonymous voluntary counselling and testing (VCT) clinical services with data from the closed Bangkok Men Who Have Sex With Men Cohort Study (BMCS) research cohort, which was specifically established to study the incidence of HIV and other sexually transmitted infections.

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Methods

Study design and population

In 2005, the Thailand Ministry of Public Health and the US Centers for Disease Control and Prevention (CDC) Collaboration established the Silom Community Clinic in a central Bangkok hospital, near to a large number of MSM entertainment venues. The clinic has an MSM-friendly environment and staff, and provides free, rapid, private, and anonymous clinical testing for HIV and other sexually transmitted infections. HIV-infected clients are offered a free CD4-positive T-lymphocyte count to assess their eligibility for antiretroviral treatment and are referred to the Thai health-care system for treatment.

Clients attend the clinic for HIV VCT, hepatitis vaccination, and clinical diagnosis and treatment of sexually transmitted infections; these services are provided free of charge and irrespective of nationality. Provision of VCT services at the Silom Community Clinic started in the second half of 2005. The cohort for incidence analysis consisted of all clients who came in for at least two HIV tests and were HIV-uninfected at the first test[7] during 2006–13.

In 2006, we began the BMCS at the Silom Community Clinic to estimate the incidence and prevalence of HIV-1 and other sexually transmitted diseases in a closed cohort population. For the BMCS, we recruited eligible men who were aged 18 years and older, were Thai nationals residing in the Bangkok metropolitan area, had male-to-male penetrative anal intercourse or oral sex in the past 6 months, and were available for follow-up visits every 4 months for up to 3 years, which was later extended to 5 years. We recruited men from HIV testing service providers, entertainment venues, the internet, and by word of mouth.[8] Individuals were enrolled during two periods: from April, 2006, to January, 2008, we recruited 1002 HIV-uninfected participants, and from September, 2009, to December, 2010, we recruited 370 HIV-uninfected participants. The reason for having the second enrolment period was to continue cohort activities for planned clinical trials of pre-exposure prophylaxis for HIV infection in Bangkok MSM.

The operation of the research clinic and VCT services was determined to be non-human subject research by the Office of the Associate Director of Science, CDC. The BMCS was reviewed and approved by the institutional review board at the CDC and the Thai Ministry of Public Health Ethical Review Committee for Research in Human Subjects.

During VCT, basic demographic data were gathered at registration. However, no behavioural risk data were gathered.[7] In the BMCS, we gathered demographic and behavioural data at baseline and at regular study visits using audio computer-assisted self-interviewing. Questions were included about potential risk factors such as drug use, sexual practices, and how often condoms were used.

Clients were screened during VCT for the presence of HIV-1 antibodies in blood with three consecutive rapid tests for the virus in accordance with the Thai National Guidelines for rapid HIV testing (Determine, Abbott, Abbott Park, IL, USA; DoubleCheck, Orgenics, Yavne, Israel, or SD Bioline, Standard Diagnostics, Kyonggi-do, Korea; and Capillus HIV-1/2, Trinity Biotech, Carlsbad CA, USA, or HIV1/2 Core, Core Diagnostic, Birmingham, UK). From 2009, clients with non-reactive screening tests were offered nucleic acid amplification testing (Aptima Genprobe, Gen-Probe, San Diego, CA, USA) and fourth generation enzyme immunoassay (AxSYM-HIV Ag/AB, Abbott Laboratories, Abbott Park, IL, USA, or Cobas Core HIV Combi, Roche Diagnostics, Mannheim, Germany) to exclude acute HIV infection. In the BMCS,[8] participants were screened for HIV infection at baseline and every 4 months with OraQuick HIV-1/2 Rapid Test (OraSure Technologies, Bethlehem, PA, USA). Reactive tests were further confirmed with three rapid tests in blood as described for VCT clients. Starting in early 2010, BMCS participants with non-reactive OraQuick also underwent further blood screening with enzyme immunoassay and nucleic acid amplification testing.[8]

Statistical analysis

We used descriptive statistics to summarise data for both BMCS and VCT cohort populations, Wilcoxon non-parametric tests to compare continuous variables, and χ^2 tests to compare categorical variables. Exact Poisson 95% CIs were calculated for HIV incidence per 100 person-years. We used α 0·05 for significance testing, and 95% CIs were constructed for measures of effect.

We calculated incidence per quarter (3 months), assuming a uniform probability distribution throughout the seroconversion interval between the last negative and first positive HIV tests.[9] We assessed temporal trends in HIV incidence in the VCT and BMCS data by quarter, using a restricted cubic spline function for time with 3 knots[10,11] in a Poisson regression with robust SE. The restricted cubic spline function provides flexible fitting of curves for continuous predictors in regression models, and allows assessment of linearity and graphical characterisation of the association between the outcome and the predictor. The number of knots chosen was based on the recommendation that 3–5 knots are sufficient.[10] We also assessed temporal clustering of HIV infections per quarter using a scan statistic.[12] The scan statistic is used to detect event clusters in space or time, or both; the procedure is used to identify the most likely cluster location, and if the p value is significant we can conclude that the most likely identified location of clustering was unlikely under the test assumptions.

For BMCS, we used a generalised estimating equation logistic regression to model the temporal trend per quarter of participants' drug use (marijuana, ecstasy, crystal methamphetamine, ketamine, sedatives, poppers,

cocaine, γ hydroxybutyric acid, or γ butyrolactone), use of drugs to enhance pleasure of sex, use of sildenafil (Viagra, Pfizer, New York, NY, USA) or similar drugs for erectile dysfunction, receptive anal intercourse, and 100% condom use in the past 4 months. The time trend was modelled with a restricted cubic spline function with 3 knots or 4 knots. We used Stata (version 12.1) and SaTSCAN software for all statistical analyses.

Role of the funding source

The funder of the study had no role in study design, data gathering, analysis, or interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

Median age of participants in the VCT cohort at first registration was 27 years (IQR 23–33) and 11% were non-Thai nationals (26% east Asians, 68% from western countries, and 6% other nationalities); median age of individuals at enrolment in the BMCS was 26 years (22–30 years). The age distributions at enrolment between the cohorts were significantly different (p<0·0001).

From 2006 to 2013, 8176 MSM came for VCT; 1999 (24%) participants had initially tested seronegative and voluntarily returned for another test, for a total of 4242 person-years of follow-up. The median interval for testing was 200 days (IQR 112–378). We detected 235 seroconversions, with a median time between last negative and first positive HIV test of 361 days (184–750). The overall HIV incidence was 5·5 per 100 person-years (95% CI 4·8–6·3). Incidence fluctuated between 2–6 cases per 100 person-years per quarter. Poisson regression modelling of the time trend with a restricted cubic spline function showed linear (p=0·054) and non-linear effects (p=0·164; table 1). The estimated overall trend was of increasing HIV incidence until 2011, then stabilisation from 2011 throughout 2013 (figure 1). After adjustment for age, the linear effect was significant (adjusted p=0·02), with the participants aged 21 years and younger at significantly higher risk of HIV infection (p<0·0001; table 1). The scan statistic identified quarter 2 of 2009 to quarter 1 of 2013 as the most likely, but not significant, time cluster (p=0·96).

Of the 1744 BMCS participants followed up from 2006–13, 1372 (79%) were HIV negative at baseline and 1259 (92%) of these had more than one follow-up test for a total of 4461 person-years, with a median follow-up time of 36 months (IQR 20–60). Retention at 36 months was 918 (67%) of 1369 patients and at 60 months was 625 (62%) of 1002 patients. Demographic characteristics of the cohort have been reported previously.[8] 238 individuals seroconverted, with an overall HIV incidence of 5·3 per 100 person-years (95% CI 4·7–6·1).

HIV incidence in BMCS peaked at 7·8 per 100 person-years in quarter 2 of 2008, and fell to 3·2 per 100 person-years in quarter 4 of 2013 (figure 2). Poisson regression

	Rate ratio (95% CI)	p value	p value, adjusted*
VCT cohort			
Time			
Overall	..	0·07	0·02
Restricted cubic spline†, linear	..	0·054	0·02
Restricted cubic spline†, non-linear	..	0·164	0·10
Age (years)			
≥30	1·0	..	..
22–29	1·89 (1·60–2·24)	..	..
≤21	2·29 (1·88–2·78)	..	<0·0001
BMCS cohort			
Time			
Overall	..	<0·0001	<0·0001
Restricted cubic spline†, linear	..	0·343	0·256
Restricted cubic spline†, non-linear	..	0·001	0·0004
Age (years)			
≥30	1·0	..	..
22–29	1·52 (1·25–1·86)	..	..
≤21	1·99 (1·50–2·65)	..	<0·0001

VCT=voluntary counselling and testing. BMCS=Bangkok men who have sex with men cohort study. *From a model including time represented by restricted cubic spline and age. †No estimates are given for the restricted cubic spline function because they are not directly interpretable.

Table 1: Temporal trend for HIV incidence, in the VCT and BMCS cohorts of men who have sex with men in Bangkok, Thailand, from 2006 to 2013
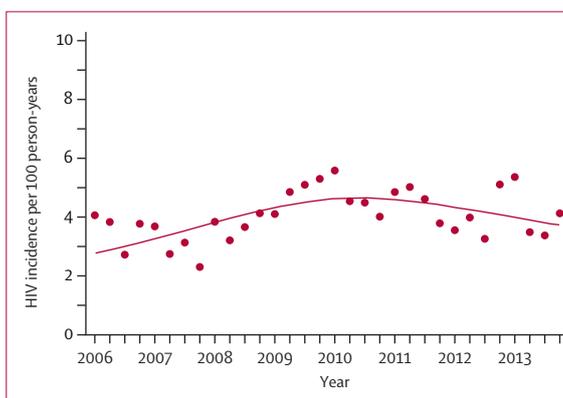

Figure 1: Quarterly HIV incidence, restricted cubic spline curve, in the VCT cohort of men who have sex with men in Bangkok, Thailand, from 2006 to 2013
VCT=voluntary counselling and testing.

For the **SaTSCAN software** see http://www.satscan.org

modelling of the time trend with a restricted cubic spline function showed a significant non-linear effect (p=0·001; table 1). The estimated temporal trend was an inverted U-shape curve (figure 2). A similar effect was noted after adjustment for age, with participants aged 21 years and younger at significantly greater risk for HIV seroconversion than were the other age groups (p<0·0001; table 1). To investigate the inverted U-shape trend in HIV infection with calendar time, we looked at the time trend by age group and time on study, compared the age distribution of the two enrolment waves, and used a scan statistic to assess temporal clustering of HIV infections.

In all three age groups, there was an inverted U-shape trend, although it was most evident in the participants aged 21 years old and younger: in the first half of 2007, the HIV incidence was greater than 15 per 100 person-years and then declined. These participants (non-seroconverters) were also more likely to be lost to follow-up than were participants aged 30 years and older (median time on study 32 months, IQR 16–32, *vs* 48 months, 32–60, respectively; p=0·001), and the participants in the second enrolment period were significantly older than those in the first period (median age 27 years (23–32) *vs* 25 years (22–30), respectively; p=0·0005).

We investigated whether the inverted U-shape trend in HIV incidence with calendar time resulted from a cohort effect of being a study participant by looking at the incidence by time on study. HIV incidence decreased with time on study, but was not significant (p=0·07). The scan statistic for temporal HIV clustering identified quarter 2 of 2007 to quarter 1 of 2010 as the most likely cluster (p=0·003).

Since the start of screening for acute infection in 2009, 52 clients from VCT and 52 individuals from BMCS were identified as acutely HIV-1 infected by use of nucleic acid amplification testing or fourth-generation enzyme immunoassay.

The overall HIV-1 incidences in BMCS and VCT were not significantly different (rate ratio [RR] 1·04, 95% CI 0·9–1·2; p=0·7). However, the trends between 2006 and 2013 were different, with an increase and then a reduction in HIV incidence (inverted U-shape curve) in the BMCS, whereas in the VCT the incidence increased until 2011 and then stabilised until 2013 (figures 1 and 2).

Table 2 is the summary of the modelling results with the generalised estimating equation logistic regression for the five risk indicators in BMCS. Figure 3 shows the temporal trends for drug use and sexual risk factors. For receptive anal intercourse, there was a linear reduction from above 60% in 2006 to about 50% in 2012–13 (p=0·02), and individuals aged 21 years and younger were more likely to report receptive anal intercourse than
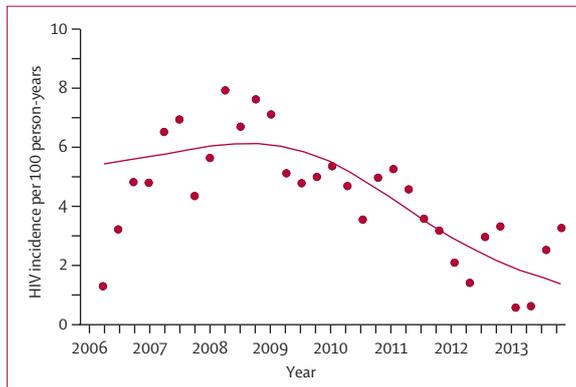

Figure 2: Quarterly HIV incidence, restricted cubic spline curve, in the BMCS cohort in Bangkok, Thailand, from 2006 to 2013
BMCS=Bangkok men who have sex with men cohort study.

	Odds ratio (95% CI)	p value*
Any drugs		
Time		
Overall	..	0·08
Restricted cubic spline†, linear	..	0·03
Restricted cubic spline†, non-linear	..	0·13
Age (years)		
≥30	1·0	..
22–29	1·29 (0·88–1·89)	..
≤21	1·89 (1·20–2·95)	0·02
Drugs to enhance sex		
Time		
Overall	..	0·0006
Restricted cubic spline†, linear	..	0·0004
Restricted cubic spline†, non-linear	..	0·016
Age (years)		
≥30	1·0	..
22–29	0·96 (0·63–1·46)	..
≤21	1·16 (0·68–1·95)	0·7
Drugs for erectile dysfunction		
Time		
Overall	..	<0·0001
Restricted cubic spline†, linear	..	<0·0001
Restricted cubic spline†, non-linear	..	0·001
Age (years)		
≥30	1·56 (1·03–2·40)	..
22–29	1·01 (0·67–1·50)	..
≤21	1·0	0·025
Receptive anal intercourse		
Time		
Overall	..	0·004
Restricted cubic spline†, linear	..	0·02
Restricted cubic spline†, non-linear	..	0·44
Age (years)		..
≥30	1·0	..
22–29	1·74 (1·41–2·15)	..
≤21	2·19 (1·65–2·93)	<0·0001
100% condom use		
Time		
Overall	..	<0·0001
Restricted cubic spline†, linear	..	<0·0001
Restricted cubic spline 1†, non-linear	..	<0·0001
Restricted cubic spline 2†, non-linear	..	<0·0001
Age (years)		
≥30	1·0	..
22–29	0·91 (0·76–1·10)	..
≤21	0·84 (0·67–1·05)	0·23

BMCS=Bangkok Men Who Have Sex With Men Cohort Study. *From a model including time represented by restricted cubic spline and age. †No estimates are given for the restricted cubic spline function because they are not directly interpretable.

Table 2: Temporal trend in behavioural risk factors in BMCS in Bangkok, Thailand, from 2006 to 2013

were older people (p<0·0001; table 2). 100% condom use increased substantially from about 45% in 2006 to about 60% in 2009 and then remained stable throughout 2013, with no significant age effect (p=0·23; table 2).

In BMCS, any drug use rose from about 4% in quarter 3 of 2006 to about 11% in quarter 4 of 2009 and then fell slightly (p=0·08), but the linear increase was significant (p=0·03; table 2). Participants aged 21 years and younger were more likely to use drugs than were the other age groups (p=0·02; table 2). Use of drugs to enhance sex increased from about 1% in quarter 4 of 2006 to about 7% in quarter 4 of 2009, and then stabilised (p=0·0006), with no age effect (p=0·7; table 2). The use of drugs for erectile dysfunction increased from about 4% in quarter 3 of 2006 to about 10% in mid-2010 and then stabilised (p<0·0001), with participants aged 30 years and older consuming more drugs for erectile dysfunction (p=0·025; table 2).

Discussion

In two cohorts at an MSM clinic in Bangkok, we noted that the HIV incidence was 5–6 per 100 person-years during 2006–13, indicating a continuing epidemic of new HIV infections in this population. This rate is almost eight times higher than the HIV incidence in people who injected drugs in the placebo group of the tenofovir trial in Bangkok during 2005–11,[13] 18 times higher than in the general population of the Thailand eastern seaboard as represented in the placebo group of the RV144 trial during 2003–08 (52% of individuals self-reported as medium-high risk),[14] and 180 times higher than the estimated incidence of 0·03% in adults in Thailand during 2011.[15] The high burden of infection in MSM relative to other populations was also noted in a study of acute HIV infection at the Bangkok Thai Red Cross anonymous clinic during 2006–07, in which 60% of new infections were in MSM,[16] and in a study of VCT repeat testers at Chiang Mai, northern Thailand, with an incidence of 8·2 per 100 person-years during 2008–09.[17] This sustained high HIV incidence 10 years after the recognition of the epidemic in MSM is in complete contrast to the Thai heterosexual HIV epidemic in the late 1980s and early 1990s in northern Thailand, where after 5 years the rates of infection were brought under control by use of systematic interventions, such as the 100% condom campaign.[1]

The temporal trend in the VCT cohort shows that incidence was not only high but increased with time until 2011 and then stabilised thereafter. The results of an earlier report also showed increasing incidence until 2011.[7] However, the additional 2 years of data in our report show that the epidemic might be stabilising and show the importance of the VCT cohort for monitoring the epidemic in Thai MSM in future years. The VCT is an open cohort, providing a sentinel estimate of the incidence of HIV in MSM in Bangkok from 2006 to 2013. The HIV incidence trend in VCT fits the general pattern of persistently high infection rates in MSM worldwide.[18,19]
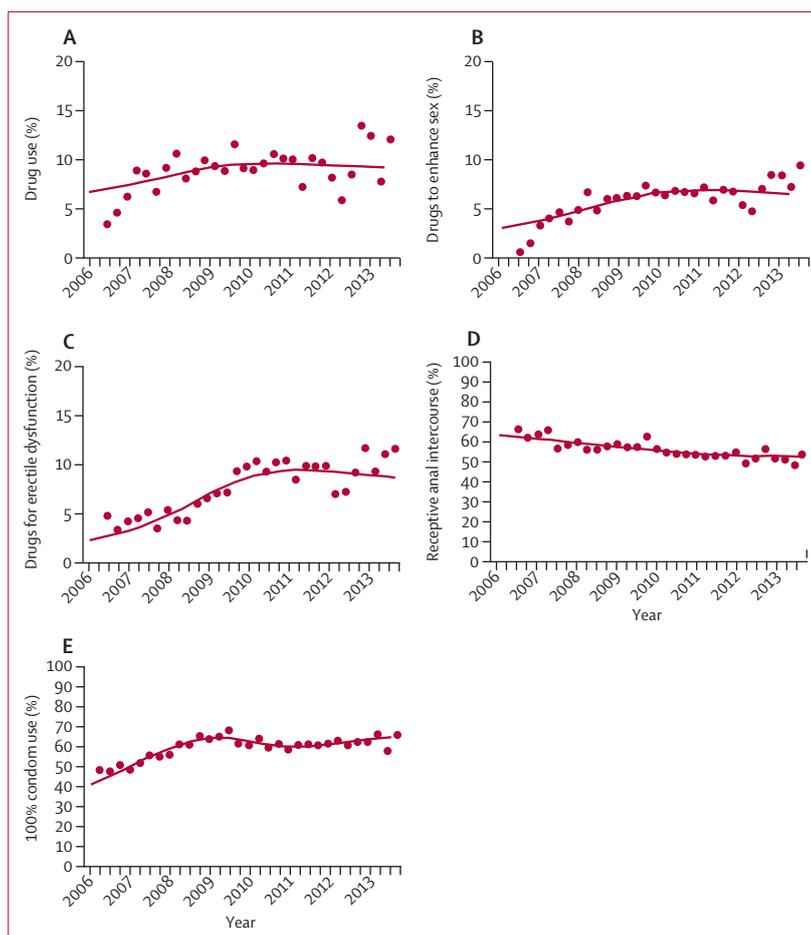

Figure 3: Quarterly reported drugs use (A), use of drugs to enhance sex (B), use of drugs for erectile dysfunction (C), receptive anal intercourse (D), and 100% condom use (E), restricted cubic spline curves adjusted for age, in the BMCS cohort in Bangkok, Thailand, from 2006 to 2013
BMCS=Bangkok men who have sex with men cohort study

The BMCS cohort had an overall incidence of 5·3 per 100 person-years. After an initial increase in HIV infections from 2006–09, however, the HIV incidence decreased, showing an inverted U-shape trend. Analysis of HIV incidence by time on study showed that the infection rates did not significantly decrease during 5 years of follow-up: there was no evidence of a cohort effect of participating in the study. The temporal trend with a peak in 2008 might have resulted from infection clusters from quarter 2 of 2007 to quarter 1 of 2010, especially in participants aged 21 years and younger in 2007. The clustering of HIV infections in MSM is one of the features of transmission in MSM populations,[18] and a similar temporal spike in incidence was noted in a cohort of people who injected drugs in Bangkok more than 15 years ago.[20] The subsequent reduction in incidence from 2009, which increased in the later years, was most likely because of ageing of the cohort because participants aged 21 years and younger were more likely to dropout early than the other age groups and participants from the

second enrolment were older than those in the first enrolment. However, the fall in HIV infection rates might also result from behavioural factors such as a decline in proportion of individuals reporting receptive anal intercourse. A causal link cannot be shown, but the trend in the data suggests an association. By contrast with the positive trend in sexual behavioural risk indicators, we noted that drug use in the BMCS increased from 2006 to 2013, especially drugs to enhance sexual experience or pleasure and drugs for erectile dysfunction. In the 2-yearly surveys between 2003–07, there was an increase in reported drug use and drug use during sex, whereas drugs for erectile dysfunction were used rarely.[4] We noted that drug use (especially for erectile dysfunction) has continued to increase in the subsequent 6 years. Drug use, particularly during sex, is widely known to impair judgment and to increase the risk of HIV transmission in

MSM, particularly if combined with drugs for erectile dysfunction.[21,22] This worrying trend in MSM in Bangkok must be addressed if the HIV epidemic is to be brought under control.

The reduction in the proportion of individuals reporting receptive anal intercourse, increase in the proportion reporting 100% condom use by calendar time, and significant decreases in other key risk factors including unprotected anal intercourse by time on study shown elsewhere[23] suggest that HIV prevention counselling and other services provided in an MSM-friendly environment, such as our research clinic have a positive effect on reducing risk factors for HIV. The need for MSM-friendly clinics is shown by the results of a survey in which 43% of health-care providers were hostile towards MSM and transgender women in Bangkok and Chiang Mai.[24] The HIV epidemic in western countries in the 1980s was primarily in MSM, and was addressed by targeted prevention programmes and health initiatives for this population. Current and new services for HIV prevention provided in a sensitive and friendly environment would be helpful to MSM in Thailand. Services might include the option of pre-exposure prophylaxis, which has been shown to be effective in MSM[25] and assessed as part of a tailored combination HIV prevention package for this population.[26,27]

Our study has limitations. The two cohorts are not representative of the general MSM population in Bangkok because they were drawn from a clinic located in the main gay nightclub or sex area in the Silom district, and comprised individuals voluntarily coming for testing or participation in a cohort study. The Bangkok metropolitan area covers more than 1500 km², and has a population of about 8 million and a large number of MSM, many of whom do not frequent the Silom district or avail themselves of VCT services. During the early phase of enrolment, HIV screening relied on rapid testing of oral fluids and might have missed some cases of acute infection. However, these cases would be expected to have been detected during follow-up.

With the high HIV prevalence according to the results of the Thai Ministry of Public Health surveillance surveys in MSM in Bangkok over the past decade, the sustained high incidence reinforces the view that there has been no alteration in the trajectory of the HIV epidemic in MSM. Greater HIV prevention efforts that address social-structural determinants of HIV risk that are not modifiable at the clinic, VCT, or behavioural level (eg, low investment)[19] and discrimination of MSM in health-care settings[24] are needed to reduce the spread of HIV infection in MSM in Thailand. Specific prevention efforts to target younger MSM are needed (panel), emphasising tailored interventions for substance use.

For the first time, in 2013, the Thai Ministry of Public Health issued national guidelines for implementation of HIV prevention in MSM and transgender women.[28]

Panel: Research in context

Systematic review

We searched PubMed on Nov 21, 2014, for reports about HIV incidence in men who have sex with men (MSM) in Thailand. We used combinations of the search terms "MSM", "HIV", "risk behaviors", "Bangkok", and "Thailand", and restricted our search to studies published since 2005, when the first cross-sectional study of HIV prevalence in MSM in Bangkok, Thailand, was published.[3] The results of the 2005 study showed a largely unrecognised epidemic of HIV in the MSM population. We found 63 publications, including three HIV incidence studies in MSM in Thailand, two of which were our previous reports[7,8] and a small study from Chiang Mai in northern Thailand done from 2008–09 in MSM and transgender women.[17] The results of another study[4] showed temporal trends in estimated HIV incidence in young MSM from cross-sectional surveys in 2003, 2005, and 2007, and trends in behavioural risk factors. We did not identify any longitudinal studies of temporal trends in behavioural risk factors in Thai MSM. The inadequacy of past HIV prevention efforts in MSM and insufficient investment in reduction of institutional or social barriers to address the epidemic in the past decade have been discussed in previous publications.[6,24,26]

Interpretation

Our results show temporal trends in HIV incidence and associated HIV risk factors from a clinical service cohort and a research cohort, both of which are the largest and longest running MSM cohorts in Thailand and to our knowledge possibly in south and southeast Asia. Similar to findings from smaller studies in the region, we have shown a significant and sustained HIV epidemic in MSM in Bangkok, with young individuals at highest risk. These findings add to the documentation of the increasing epidemic of HIV in MSM globally.[18] During structured observation in the population, we noted divergent HIV trends in the voluntary counselling and testing and in the Bangkok men who have sex with men cohort study cohorts. Clients returning for anonymous testing were likely to have a sustained and higher risk than were individuals participating in a longitudinal cohort whose self-reported risky sexual behavioural practices decreased, despite an increase in recreational drug use. This difference in HIV incidence trends suggests that regular clinical testing and follow-up in a friendly setting that provides a full range of prevention services for MSM might reduce their risk of HIV infection. These findings give the Thai Public Health authorities an idea of the trajectory of the epidemic from 2006 to 2013; the authorities can use these results to help predict the future direction of the epidemic and tailor HIV prevention efforts especially for young MSM. The inclusion of pre-exposure prophylaxis could mitigate the risk of infection in this key population with a drastically high HIV incidence.

The BMCS cohort will close in 2015. The VCT cohort remains a valuable and unique source of incidence data for the monitoring of new HIV infections in the MSM population in Bangkok. The VCT data along with ongoing 2-yearly HIV prevalence surveys will provide a rich information base to monitor the epidemic and control it through prevention efforts.

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