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Men who have sex with men, infectious syphilis and HIV coinfection in inner Sydney: results of enhanced surveillance

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Abstract

Background: The resurgence of infectious syphilis in men who have sex with men (MSM) has been documented worldwide; however, HIV coinfection and syphilis reinfections in MSM in inner Sydney have not been published.

Methods: For all laboratory syphilis notifications assessed as a newly notified case or reinfection, a questionnaire was sent to the requesting physician seeking demographic data and disease classification. Sex of partner and HIV status were collected for all infectious syphilis notifications in men received from 1 April 2006 to March 2011.

Results: From April 2001 to March 2011, 3664 new notifications were received, 2278 (62%) were classified as infectious syphilis. Infectious syphilis notifications increased 12-fold from 25 to 303 in the first and last year respectively, and almost all notifications were in men (2220, 97.5%). During April 2006 to March 2011, 1562 infectious syphilis notifications in males were received and 765 (49%) of these men were HIV-positive and 1351 (86%) reported a male sex partner. Reinfections increased over time from 17 (9%) to 56 (19%) in the last year of the study and were significantly more likely to be in HIV-positive individuals ($\chi^2 = 140.92$, degrees of freedom = 1, $P = <0.001$).

Conclusion: Inner Sydney is experiencing an epidemic of infectious syphilis in MSM and about half of these cases are in HIV-positive patients. Reinfections are increasing and occur predominantly in HIV-positive men. Accurate surveillance information is needed to inform effective prevention programs, and community and clinician education needs to continue until a sustained reduction is achieved.

Keywords

coinfection, men, hiv, who, have, sex, syphilis, enhanced, surveillance, results, sydney, inner, infectious

Disciplines

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Key Words

Syphilis, surveillance, gay men, HIV/AIDS, public health

Abstract

Background

The resurgence of infectious syphilis in men who have sex with men has been documented worldwide; however, HIV co-infection and syphilis re-infections in men who have sex with men in inner Sydney have not been published.

Methods

For all laboratory syphilis notifications assessed as a newly notified case or re-infection, a questionnaire was sent to the requesting physician seeking demographic data, and disease classification. Sex of partner and HIV status was collected for all male infectious syphilis notifications received from 1 April 2006 to March 2011.

Results

From April 2001 to March 2011, 3664 new notifications were received, 2278 (62%) were classified as infectious syphilis. Infectious syphilis notifications increased 12-fold from 25 to 303 in the first and last year respectively and almost all notifications were male (2220, 97.5%). During April 2006 to March 2011, 1562 infectious syphilis notifications in males were received, 765 (49%) were HIV positive and 1351 (86%) reported a male sex partner. Re-infections increased over time from 17 (9%) to 56 (19%) in the last year of the study and were significantly more likely to be HIV positive ($\chi^2 = 140.92$, DF=1, $P < 0.001$).

Discussion

Inner Sydney is experiencing an epidemic of infectious syphilis in men who have sex with men and about half of these cases are HIV positive. Re-infections are increasing and occur predominantly in HIV positive men. Accurate surveillance information is needed to inform effective prevention programs and community and clinician education needs to continue until a sustained reduction is achieved.

Background

The resurgence of infectious syphilis in the major cities of industrialised countries has frustrated public health experts and policy makers for the last decade.(1) Most of the epidemics are attributed to men who have sex with men (MSM) (2-3) and men with human immunodeficiency virus (HIV) infection are disproportionately affected.(4-5)

Australia has not been spared and increases in male infectious syphilis notifications first seen in New South Wales (NSW) in 1999 have now been reported in most Australian states. Australian rates increased markedly from 5.2 in 2005 to 12.1 per 100,000 population and then declined slowly to 8.9 in 2010 (6), a decrease that has been insufficient to interrupt the epidemic.

Syphilis rates fell substantially among MSM from the mid-1980s as sexual behaviour changed with the developing HIV epidemic.(7) However, the introduction of antiretroviral therapy in 1996 improved survival and sexual wellbeing of people with HIV and this coincided with an increase in sexually transmissible infections (STIs).(8) Higher rates of syphilis are seen in HIV positive men and this has been attributed to higher rates of unprotected anal sex with casual partners, HIV 'serosorting' and oral sex.(7) Other risk factors include the use of sex enhancing and recreational drugs and online social media to seek sexual partners.(9) Syphilis appears to promote the acquisition and transmission of HIV raising concerns that some behaviours and factors contributing to these outbreaks may also lead to increases in HIV infections.(9)

In NSW, doctors, hospitals and laboratories are required to report syphilis cases to local public health units (PHUs) under the Public Health Act 1991. Although doctors are required to notify new cases of syphilis most notifications are received only from laboratories. New infections are generally unable to be separated from past infections

based on the limited serological results provided with notifications. In order to facilitate case classification and to determine if the outbreaks occurring among MSM reported overseas were occurring in inner Sydney, which was to host the Gay Games in 2002, syphilis surveillance was strengthened. This began in the two inner Sydney PHUs in 1999 and 2001.

This paper will describe the epidemiology of syphilis in inner Sydney for the 10-year period 1 April 2001 – 31 March 2011 and focus on an enhanced set of data collected for infectious syphilis notifications in males received from 1 April 2006 to 31 March 2011 when the sex of the case's partner(s) in the last 12 months and HIV status were collected. Surveillance methods and the difficulties faced by health professionals in collecting risk factor data to allow for targeted intervention will also be discussed.

Methods

The dataset included all new laboratory syphilis notifications received from 1 April 2001 to 31 March 2011 by the PHUs, for people living in the inner Sydney local government areas (LGAs) shown in Figure 1. The estimated midyear residential population of this area was 1.39 million in 2011 which was 35% of the Sydney region and 19% of the NSW population.⁽¹⁰⁾ Laboratory notifications were assessed by PHU surveillance personnel as either a newly notified case or possible re-infection of a previously notified case. The laboratory results were compared to any previously reported results and a re-infection was suspected if there was a 4-fold increase in Rapid Plasma Reagin (RPR), detection of *Treponema pallidum* by nucleic acid testing or symptoms suggestive of infectious syphilis were provided on the laboratory request form. A questionnaire was sent to the physician requesting the pathology test to ascertain the classification of the disease. Disease classification was determined by the clinician on laboratory results, past history of treatment, clinical examination and sexual history. If the surveillance form was returned

as infectious syphilis in a previously notified case this would be classified as a re-infection. All re-infections were accepted irrespective of when they were previously reported. The demographic data requested included Aboriginality, country of birth and language spoken. The data collected over the study period evolved in response to surveillance needs and data on presenting symptoms, stage of infection and place of acquisition; Australia or overseas, was only collected consistently since 2003. A reminder letter was sent if the completed questionnaire was not returned within a month and another in three months.

With the support of general practitioners (GPs) and community organisations representing gay and other MSM (the AIDS Council of NSW - ACON and people with HIV - Positive Life NSW) ethical approval was obtained from the Human Research Ethics Committee – Northern Hospitals Network, South Eastern Sydney Illawarra Area Health Service and the Sydney South West, Royal Prince Alfred Hospital Ethics Review Committee for the respective PHUs to collect sex of partners and HIV status. The separation of HIV status and sex of partner from other routine identified surveillance information was requested by the ethics committee. Data collection for the additional information for this study began in April 2006.

Statistical analyses

NSW syphilis notification and population data were obtained for the 10-year period 2001-2011 from the Health Outcomes and Information Statistical Toolkit (HOIST), maintained by the NSW Ministry of Health.⁽¹⁰⁾ Datasets used were from the Notifiable Conditions Information Management System (NCIMS) and the Australian Bureau of Statistics population dataset. Data analyses were conducted using SPSS version 19 and SAS version 9.2. The Chi-square test (χ^2) was used to test for differences in the proportions of re-infections, disease stage, symptom presence and types, sex of partner, age group and

residential location by HIV and re-infection status for male infectious syphilis notifications between April 2006 and March 2011. Trends in the proportions of HIV-infected, proportion with male sex partner, and proportion re-infected were tested using the Mantel-Haenszel Chi-square test for linear trend.

Results

All syphilis notifications

In the 10-year period from 1 April 2001 to 31 March 2011, 3664 laboratory notifications were classified as new notifications. Of these 2278 (62%) were infectious syphilis, 1381 (38%) syphilis more than two years or unknown duration and five congenital syphilis. Infectious syphilis notifications increased 12-fold from 25 in 2001 to 303 in 2011. A marked increase in notifications was first noted in 2002, then again in 2004 and 2007 and has slowly declined since 2009. Almost all notifications were in men (2220, 97.5%) (Figure 2) and the male-to-female ratio increased from 12:1 to 75:1 from 2001 to 2011. Syphilis case classification and reporting of Aboriginality has improved over time; in the last five years 95% of notifications have been classified and Aboriginality reported for 92% of infectious syphilis notifications. Thirty-two (1%) infectious syphilis cases identified as Aboriginal. Demographic characteristics of infectious syphilis notifications are shown in Table 1.

Infectious syphilis notifications in males April 2006 to March 2011 – enhanced surveillance

During this 5-year study period, 1562 infectious syphilis notifications in males were received. Of these 974 (62%) lived in the City of Sydney LGA. Most (1241, 79%) acquired syphilis in Australia; acquisition was overseas for 183 (12%) and unknown for 138 (9%). The majority (1323, 85%) were seen by HIV treatment prescribers experienced in syphilis management. These include doctors from several high MSM caseload general

practices in the Sydney suburb of Darlinghurst (45%), a sexual health (21%) or specialist (19%) service. The proportion notified with infectious syphilis who were HIV positive did not change in the 5-year period ($\chi^2=0.47$, DF =4, p=0.976), and there was no change in the proportion reporting a male sex partner ($\chi^2 = 4.35$, DF=4, p=0.360).

The frequency of notifications by stage of syphilis changed over time ($\chi^2=22.55$, DF=8, P=0.004): secondary cases were more frequently notified than primary and early latent cases initially, while the reverse was observed at the end of the study period (Figure 3). HIV positive cases were significantly more likely to be diagnosed with secondary or early latent syphilis, whereas HIV negative cases were more likely to be diagnosed with primary syphilis ($\chi^2=28.43$, DF=2, P=<0.001) (Table 2).

Symptoms were reported in 926 (59%) cases and this proportion did not change significantly over the five years ($\chi^2=7.87$, DF=4, P=0.097). Neurological symptoms were present in 51 (3%) cases; and although uveitis was reported in four cases, the nature of these neurological symptoms was generally not reported. HIV positive men (32) were significantly more likely to report neurological symptoms than HIV negative men (15) ($\chi^2=4.62$, DF=1, P=0.032). There was no association between HIV status and presence of symptoms overall ($\chi^2=3.35$, DF=1, p=0.067) (Table 2).

During the 5-year period, there was a significant increase in the proportion of notifications that were re-infections from 17 (9%) in 2006 to 56 (19%) in 2011 ($\chi^2=16.72$, DF=1, P=0.002) (Figure 4). Among the re-infections, 227 men had two syphilis notifications, 18 had three syphilis notifications and five men had four notifications. HIV co-infection was reported for most re-infections (87%) and all but one case had only male sexual partners. Re-infected men were significantly more likely to be HIV positive ($\chi^2=140.92$, DF=1,

P=<0.001), be over 39 years ($\chi^2=21.38$, DF= 1, P= <0.001), live in the City of Sydney LGA ($\chi^2=8.21$, DF=1, P= 0.004), be less likely to report symptoms ($\chi^2=9.73$, DF=1, P=0.002); and to report having sex with men ($\chi^2=6.94$, DF=1, P=0.008) than men with one notification (Table 2). Of the re-infections 159 (64%) were born in Australia and one identified as Aboriginal.

Discussion

Syphilis surveillance has shown that inner Sydney has experienced a resurgence of infectious syphilis in men. An increase noted firstly in 2002 and suspected to be in MSM (11) was confirmed from 2006 onwards when sex of partner and HIV status was collected. About half of the cases were HIV positive. These findings are similar to epidemics occurring in other cities with large gay male populations overseas and in Australia.(4-5,12) The data collected represents 74% and 26% of infectious syphilis notifications in NSW and Australia respectively.(10,13) The epidemic has not spread to the heterosexual population; female cases of infectious syphilis and congenital syphilis have remained few. Early identification of any changes in sex, reported sex of partner, and HIV status are essential to ensure appropriate prevention programs are developed.

Syphilis is effectively treated with penicillin and treatment failure is rare.(14) During the study period re-infections increased 3-fold. Re-infections may have been underestimated as questionnaires were not sent out for previously notified cases unless the laboratory report was suggestive of a re-infection and re-infections in coded notifications from sexual health clinics may have been missed. It is difficult to determine whether this increase in second and third infections is part of the evolution of the epidemic, reflects an increase in testing, or both. HIV co-infection was reported for most re-infections. Studies in Australia and overseas have also shown that HIV infection was associated with an increased risk of re-infection.(15-16) Several studies have identified

a high number of HIV positive patients with asymptomatic infectious syphilis when syphilis serology was performed as part of HIV monitoring.(17-18) In 2010, clinical care guidelines were amended and syphilis testing for HIV positive MSM patients as part of routine HIV monitoring was recommended.(19) Information on the reason for testing was not collected and the impact of any increase in routine screening of HIV positive men during the study period cannot be measured.

Although the stage of syphilis infection changes over the study period, the number of notifications within each category was in equal proportion. This differs to early reports from this local epidemic (11) and overseas (4) of relatively low proportions of early latent syphilis. Analysis of syphilis stage and HIV status showed that HIV positive men were more likely to be diagnosed with secondary or early latent syphilis whereas HIV negative men were more likely to have primary syphilis. More asymptomatic HIV positive men may be diagnosed with early latent syphilis through increased screening however, screening opportunities may still be missed. A recent Australian study reported that annual syphilis testing rates in gay men were relatively high. However, retesting rates are still lower than the recommended quarterly concurrent syphilis testing with immune function tests in men with HIV and 3-6 monthly in men with more than 10 partners in the last 6 months.(20) It is important that education continues to encourage those with symptoms to present early for treatment and promote syphilis testing at STI and HIV care visits.

The study has a number of limitations. HIV status, sex of sexual partner and stage of infection were only available for a 5-year period for this review, limiting the longitudinal analysis possible for these key fields. Information about the reason for testing and partner notification was not collected. We were unable to access sufficient laboratory testing data to assess the impact of changes in syphilis screening practices. Also our

study only collected sex of partner rather than sexual identity information. However, in inner Sydney a similar proportion of men report lifetime same sex experiences as identify as homosexual so the community response is not likely to have been altered substantially with this additional information.(21) Enhanced syphilis surveillance in Sydney has had to strike a balance between collecting detailed patient and clinical characteristics and clinician cooperation with completion of data collection forms. This balance restricted the amount of information that could reasonably be collected.

The health response to the resurgence of syphilis in gay men in inner Sydney has been led by the Sexually Transmissible Infections in Gay Men Action Group (STIGMA), a public health partnership formed in 2000 to provide a coordinated response to STIs in inner Sydney gay men. The PHUs provide six monthly surveillance reports to STIGMA and increases in syphilis notifications have triggered media alerts and health promotion initiatives. Community initiatives include the ‘WhyTest.org.au Campaign’ in 2004 and the ‘Join me in October Campaign’ in 2007 (22) while MSM STI testing and care guidelines have been developed and promoted to health care providers.(23) The WhyTest website was established to provide information on STIs and HIV and a partner notification and testing reminder service for MSM in Sydney. Both the reminder and partner notification features have proved popular.(24) Increased testing from these initiatives may have influenced infectious syphilis notification rates over the study period. However, a Melbourne study suggests increased transmission is a more likely cause for increased notifications than increased testing possibly during the early part of our study period.(25) Syphilis testing was introduced into a Sydney gay community self-report survey in 2009 and testing has remained stable.(26) In 2012, 78.7% of HIV positive men and 61% of HIV negative men stated they had been tested for syphilis in the prior 12 months.

Mathematical modelling undertaken for the Australian National Gay Men's Syphilis Action Plan (NGMSAP) has shown that increasing the frequency of testing and treatment of high risk groups including gay men who have group sex and those with more than 10 partners a year is needed to reduce the incidence of syphilis.(27) However, a recent study has shown that syphilis retesting rates in gay men in Australia are still lower than recommended.(20) Reminders to clinicians and patients have been shown to be effective at increasing STI retesting rates (28-29) and their more widespread use should be encouraged. Contact tracing was also explored in the NGMSAP and although it was acceptable, the high level needed to impact the epidemic was unfeasible.(27) Contact tracing remains a vital part of syphilis control efforts and health professionals need to refresh their techniques to incorporate the use of online and electronic technologies. These new approaches allow for contact to be made with known and 'anonymous' partners for whom online identities, mobile telephone numbers or email addresses are known.(30)

Complete and accurate surveillance information is needed for effective syphilis prevention programs. The NSW Public Health Act 1991 prevented disclosure of the identity of patients with HIV infection to third parties, and it was unclear about the legality of collecting additional risk factor information. As infectious syphilis notifications increased, high MSM caseload GPs provided anecdotal information that men with HIV were at the highest risk of new syphilis infection. The PHU had an established relationship with ACON and Positive Life NSW through their representation of the gay and MSM community at STIGMA. Both groups were supportive of the need to collect additional information to inform public health action. As a result of the experience, the NSW Public Health Act 2010 which came into force on 1 September 2012 has a clear provision for collection of risk factors on cases of notifiable STIs. Amendments to allow

collection of HIV status on identified cases under strict conditions when required to inform timely public health action, are currently being considered.

At the end of the study period, infectious syphilis appeared to be responding to control efforts in inner Sydney. Monthly notifications of infectious syphilis peaked in March 2009 and an 18% reduction was seen in March 2011. This reduction unfortunately has not continued and notifications have remained stable since then.(10) While sexual behaviours conducive to the transmission of STIs persist, (26) it is essential that surveillance personnel have the ability to routinely collect risk factor information that will inform health policy and prevention programs. This is especially relevant when outbreaks of other diseases such lymphogranuloma venereum and shigellosis occur in MSM.(31-32) Community and clinician education and service enhancements to implement these programs will also need to continue until a sustained reduction is achieved.

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Table 1: Demographic characteristics of persons notified with infectious syphilis 2001-2011

01 April 2001– 30 March 2011

(n=2278)

Sex		
	Male	2220
	Female	58
Median age (years) (range)		38.7 (15.3-79.9)
Aboriginal Status		
	Aboriginal or Torres Strait Islander	32 (1.4%)
	Not Aboriginal or Torres Strait Islander	2075 (91.1%)
	Unknown	171 (7.5%)
Country of birth		
	Australia N (%)	1283 (56.3%)
	Other N (%)	750 (32.9%)
	Unknown N (%)	245 (10.8%)
Language		
	English N (%)	1855 (81.4%)
	Other language N (%)	188 (8.3%)
	Unknown N (%)	235 (10.3%)
Local Government Area		
	City of Sydney	1444 (63.4%)
	Other Sydney	834 (36.6%)

Table 2: Selected variables for men notified with infectious syphilis in the study area April 2006 - March 2011 by HIV status and syphilis re-infection

		HIV Status			χ^2	p	Re-infection		χ^2	p	Total
		Positive n (%)	Negative n (%)	Unknown* n			First infection n (%)	Re-infection n (%)			
Re-infection	First infection	552 (72.2)	656 (95.5)	104	140.92	<0.001	-	-	-	-	1312
	Re-infection	213 (27.8)	31 (4.5)	6			-	-			-
Stage	Primary	214 (28)	278 (40.5)	45	28.43	<0.001	465 (35.4)	72 (28.8)	5.32	0.070	537
	Secondary	289 (37.8)	204 (29.7)	28			437 (33.3)	84 (33.6)			521
	Latent	262 (34.2)	205 (29.8)	37			410 (31.3)	94 (37.6)			504
Presence of symptoms	Any symptom	436 (57)	424 (61.7)	66	3.35	0.067	800 (61)	126 (50.4)	9.73	0.002	926
	No symptom	329 (43)	263 (38.3)	44			512 (39)	124 (49.6)			636
Sex of partner	Male	727 (95)	596 (86.8)	28	38.43	<0.001	1114 (84.9)	237 (94.8)	6.94	0.008	1351
	Female	2 (0.3)	38 (5.5)	4			43 (3.3)	1 (0.4)			44
	Male and female	4 (0.5)	11 (1.6)	2			16 (1.2)	1 (0.4)			17
	Unknown	32 (4.2)	42 (6.1)	76			139 (10.6)	11 (4.4)			150
Age group	< 40 years	320 (41.8)	429 (62.4)	60	60.77	<0.001	713 (54.3)	96 (38.4)	21.38	<0.001	809
	≥40 years	445 (58.2)	258 (37.6)	50			599 (45.7)	154 (61.6)			753
Local Government Area	City of Sydney LGA	503 (65.8)	411 (59.8)	60	5.45	0.020	798 (60.8)	176 (70.4)	8.21	0.004	974
	Other Sydney LGA	262 (34.2)	276 (40.2)	50			514 (39.2)	74 (29.6)			588
Total		765 (52.7)	687 (47.3)	110			1312 (84)	250 (16)			1562

*excluded unknown HIV status from analysis

Figure 1: Map showing the Local Government Areas of Sydney included in the study area

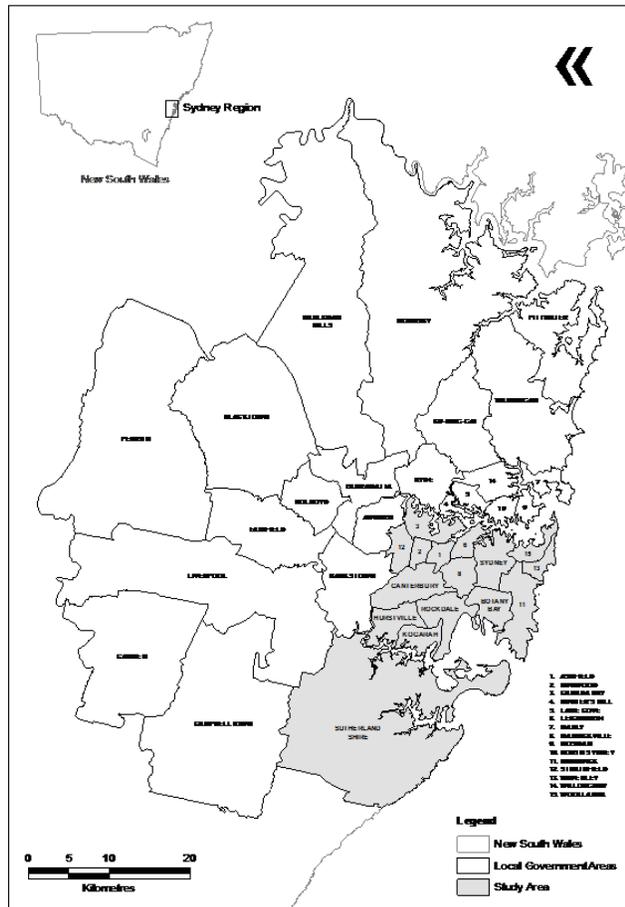


Figure 2: Infectious syphilis notifications in the study area, April 2001 – March 2011

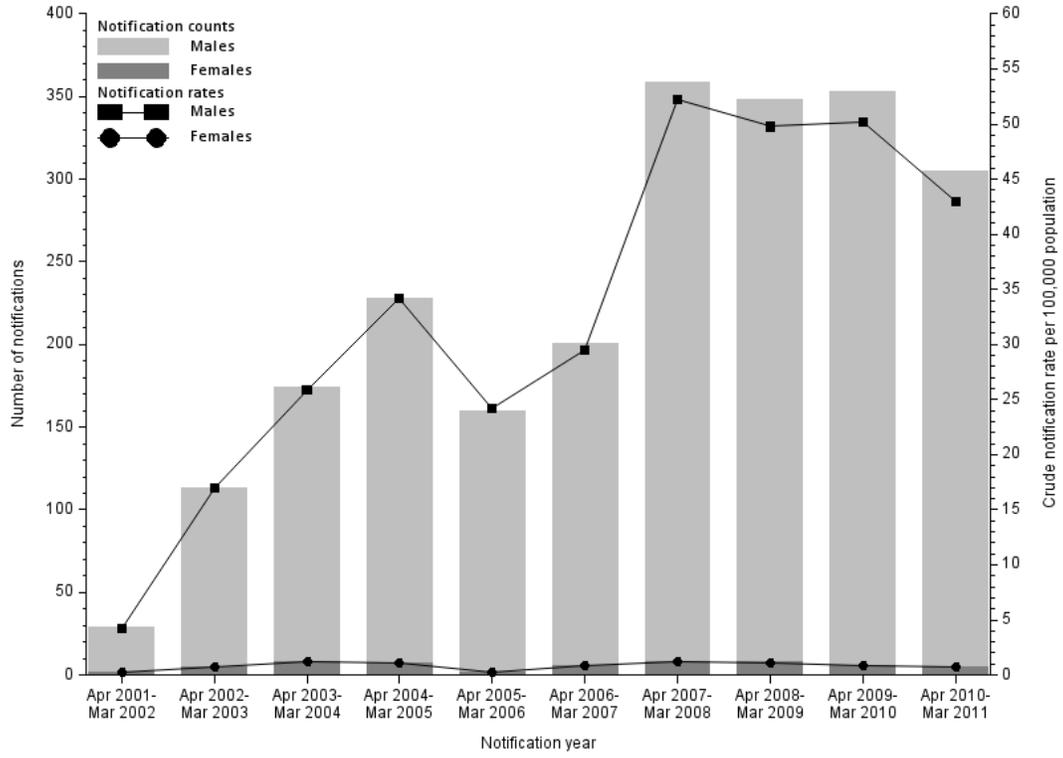


Figure 3: Infectious syphilis notifications in the study area by stage of infection April 2006 – March 2011

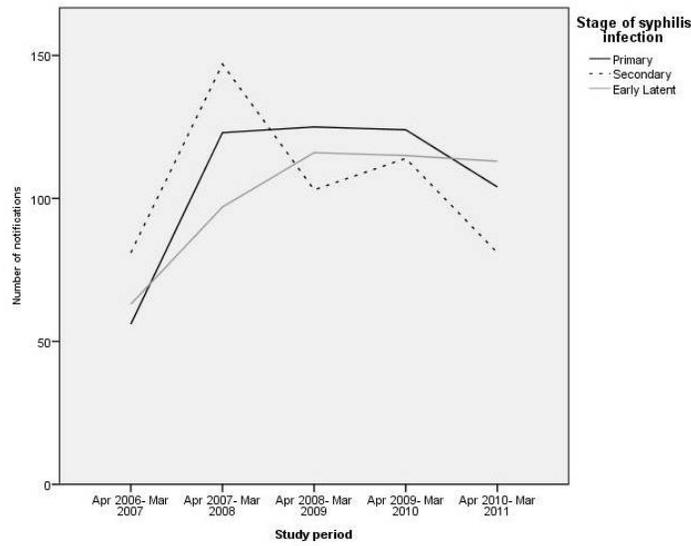
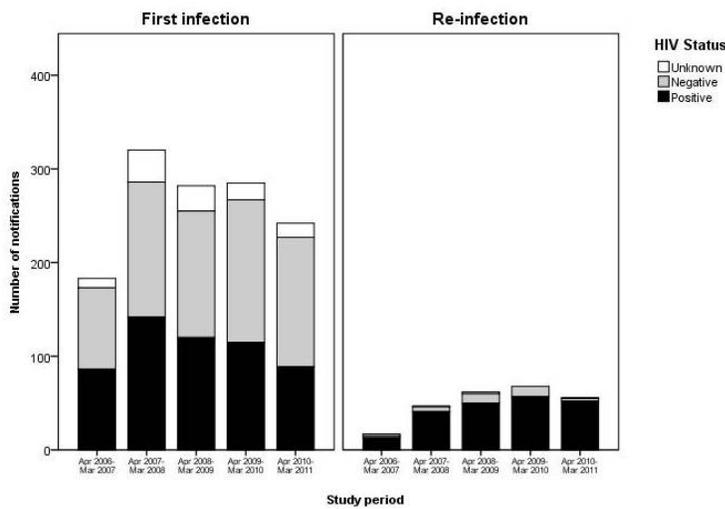


Figure 4: HIV status of new syphilis cases and re-infections in the study area April 2006 – March 2011



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