ACCESS

The Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections (STIs) and Blood Borne Viruses (BBVs)

NSW HIV report 2007 – 2013

Submitted to NSW Ministry of Health

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Executive Summary

Introduction

In the fight against HIV, early detection and treatment have emerged as key components for controlling the epidemic. 'Treatment as Prevention' (TasP) involves frequent HIV testing of at-risk populations and early treatment among those diagnosed with the virus. Mathematical modelling shows the potential efficacy of this approach, predicting that increasing HIV treatment coverage to 70% among people with HIV while decreasing the time from infection to diagnosis by 30% would reduce HIV incidence by 32%[1]. In NSW, the HIV strategy has adopted specific targets in this domain: increasing the proportion of people with HIV on treatment to 90% and reducing the average time between infection and diagnosis to 1.5 years[2].

There has been a concerted effort over the past few years to make testing more accessible and convenient, and increase the uptake of treatment. Models that have been implemented include 'express' services for sexual health clinics (SHCs), SMS testing reminders, community-based HIV testing, availability of rapid HIV testing, social marketing campaigns, regulatory changes enabling pharmaceutical subsidies for patients with CD4 counts >500 cells/mm^3, promotion and updates of clinical guidelines, forums with clinicians, and more. Understanding the impact of these initiatives requires monitoring of a comprehensive series of indicators on testing and treatment but also measurement of indicators to evaluate whether there has been any decline in HIV infection levels.

Methods

ACCESS is a national surveillance network established in 2007, originally with a focus on chlamydia testing and positivity. In 2013, the project was expanded through funding from select state health departments to include HIV and other sexually transmissible infections (STIs) beyond chlamydia. Today, ACCESS involves 77 sites spanning four networks of clinics and laboratories.

This report includes data from 33 SHCs representing 14 services in NSW and 8 general practice (GP) clinics, of which 2 see a high caseload of gay, bisexual and other men who have sex with men (GBM). From each clinic, de-identified line-data on all consultations, tests, results and treatments were electronically extracted, and where possible have been used to report annual trends from 2007 – 2013. Indicators relating to attendance, HIV testing, HIV test positivity, and the treatment and management of HIV are stratified in this report on the basis of sex, HIV status, GBM status, age, and sexual risk behaviours. These indicators are also stratified by other priority populations, including people who inject drugs (PWID), those identified as Aboriginal or Torres Strait Islander, and female sex workers (FSWs).

The data extraction process is unique to each SHC and it was, therefore, not possible to monitor patient movement between services. Indicators relevant to HIV re-testing and HIV treatment only report on activities within each individual clinic.

HIV incidence was calculated among GBM using repeat testing methods. Patient data were included if there were at least 2 tests for HIV during the study period. The person years that a patient contributed were calculated as the time between the first and last tests for HIV, or the first test for HIV and a positive result. Because of the timeframes associated with this analysis, data for 2007 and 2013 do not allow

[1] Jansson J, Kerr CC, Wilson DP. Predicting the population impact of increased HIV testing and treatment in Australia. *Sexual Health*. 2014.
[2] NSW Ministry of Health. *NSW HIV Strategy 2012 - 2015: A New Era*. 2012. Sydney, NSW.

sufficient opportunity for future or past testing. For example, a person tested in 2013 may have gone onto have another test in 2014 but this would not be captured in this dataset and as a result would confound the calculations. A similar issue arises in 2007, as patients may have been tested in 2006 or earlier but this information would not be properly captured. To correct for this imbalance, imputations that assumed an individual maintained a similar testing patterns as previous years were therefore applied. The time to infection was calculated as the average time between the most recent negative test and a positive result.

Results

Attendance

SHCs

Overall, the total *number of people attending SHCs* in NSW increased by 12%, from 29,895 in 2007 to 33,706 in 2013. Across priority populations, the most prominent increase was observed among GBM, with a 75% increase in attendance in 2013 compared with 2007.

HIV testing

SHCs

Overall, the *total number of HIV tests* conducted at SHCs in NSW increased by 70% from 12,825 in 2007 to 21,835 in 2013. Across priority populations, the largest increase was observed among GBM, with a 165% increase in total HIV tests from 4,121 in 2007 to 10,918 in 2013. The number of *individual GBM tested* increased by 116% from 3,143 in 2007 to 6,777 in 2013, equating to an average of 1.3 HIV tests per GBM in 2007 and 1.6 tests in 2013.

The greatest increases in total tests and individuals tested were observed in 'high risk' GBM (indicated by self-reported risk behaviour or an STI diagnosis in the last 2 years) with a 130% increase in total HIV tests in high risk GBM from 1,435 in 2009 to 3,304 in 2013, and the number of individual high risk men tested for HIV increasing from 916 in 2009 to 1,685 in 2013 (relative increase of 84%). This increase equates to an average of 1.5 tests per high risk GBM in 2007 to an average of 1.9 tests in 2013 (**see Figures 14 and 15**). To understand why there was an increase in total HIV tests and individual GBM tested, this report considers additional HIV testing indicators, namely uptake and repeat HIV testing.

Uptake of HIV testing (proportion of attendees who received at least one test for HIV in that year) in HIV negative GBM patients attending SHCs increased 17% from 76% in 2007 to 93% in 2013 (relative increase of 22%), with the greatest increase in GBM aged 40 years and older.

Repeat testing also increased in GBM. Sexual health testing guidelines for sexually-active GBM recommend a minimum of 12-monthly HIV testing[3]. For GBM tested for HIV, the proportion who returned within 13 months at the same service (allows 1 extra month) and had a subsequent HIV test increased 11% from 41% in 2007 to 52% in 2013 (relative increase of 26%). It is also recommended that high risk men should be tested for HIV every 3 – 6 months; among high risk men there was a 17% increase in those who returned within 6 months (plus 1 month grace period) for a follow-up test, from 37% in the first half of 2009 to 54% in the last half of 2013 (relative increase of 46%).

HIV testing among GBM was also assessed as part of a 'testing cascade' (**see Figure 23**). In 2007, of the 4,112 HIV negative GBM who attended SHCs in NSW, 3,142 (76%) were tested for HIV and 1,167 (28%) had

[3] Templeton DJ, Read P, Varma R, Bourne C. Australian sexually transmissible infection and HIV testing guidelines for asymptomatic men who have sex with men 2014: a review of the evidence. *Sexual Health*. 2014;11(3):217-29.

a re-test at the same clinic within 13 months. By comparison, of the 7,306 GBM who attended in 2013, 93% were tested for HIV and 43% had an initial test followed by a re-test at the same clinic within 13 months.

GP clinics

Data from GP clinics was available from 2011 onwards. At GP clinics with a high caseload of GBM there was a 10% increase in GBM *attending the clinics* (from 4,494 in 2011 to 4,947 in 2013) and 11% increase in *total tests* among GBM between 2011 and 2013, from 2,034 to 2,253 (in the same time period at SHCs there was 53% increase in total HIV tests among GBM.) There was no increase in the *uptake of testing* in those attending (proportion of attendees receiving at least 1 test for HIV in that year) (~49% each year) and the proportion of patients re-tested within 13 months of an initial test also remained relatively stable at around 24% per year.

In the 6 other 'general' GP clinics (no high caseload of GBM) a very small proportion of male and female patients were tested for HIV between 2009 and 2013, but the proportion doubled from 0.9% in 2009 to 1.8% in 2013.

HIV positivity

SHCs

The proportion of unique *individuals who tested positive* (any positive test in an individual) for HIV at services in NSW remained stable overall. In 2007, 0.6% of individual male patients tested for HIV had positive results and this increased to 0.8% in 2013. Among individual female patients, positivity rose from <0.01% in 2007 to 0.2% in 2013. Positivity in individuals was higher among GBM, at 1.2% in 2007 then dropping in 2010 to 0.9% before rising again to 1.5% in 2011 and 2012 then falling to 1.1% in 2013 (**see Figure 27**).

The proportion of *total tests (i.e., non-unique patients) that were positive* was lower than the proportion of individuals who tested positive, which is because this measure of positivity includes multiple tests for the same person in a year. Among GBM, 0.9% of HIV tests in 2007 were positive, which rose to 1.0% in 2009 before falling to 0.7% in 2013.

HIV incidence

SHCs

Using the repeat testing methods described above, annual estimates of HIV incidence per 100 person years (PY) at SHCs in NSW were calculated for GBM. For new HIV infections (indicated by a negative HIV test followed by a positive HIV test), we took the midpoint as the time of infection and person years involved the time period between repeat tests. For 2013, we assumed GBM undertook repeat testing at a similar rate to previous years. In 2007 and 2008, HIV incidence was calculated at around 0.8/100PY, which rose sharply in 2009 to 2.18/100PY before falling slightly and remaining stable until 2013. In 2013, HIV incidence among GBM was highest among men aged 30 – 39 years (2.72/100PY).

When comparing incidence, positivity and notifications a clear pattern emerged. Among GBM, positivity and HIV notifications annually reflected each other quite closely. Incidence, however, peaked in 2009, which was followed by a rise in notifications in 2011 and 2012[4] (**see Figure 31**). A delay between incidence

[4] New South Wales Ministry of Health (MoH). *NSW HIV Strategy 2013 Annual Data Report*. Sydney, NSW: NSW MoH

and notifications has been observed in a previous analysis, which found a lag of 2 – 3 years between incidence and subsequent notification[5].

Incidence was also compared to behavioural data collected from HIV negative men in Sydney[6]. This analysis suggests that the trends in condomless anal sex with casual partners reported each year mimic trends in HIV incidence in the same year (**see Figure 32**). This consistency is perhaps expected considering that risk behaviour would likely facilitate subsequent increases in HIV transmission.

HIV treatment & management

SHCs

Between 2007 and 2013, there was a 64% increase in patients with HIV attending SHCs, from 1,987 to 2,253. Overall, the majority of people with HIV who attended a SHC in NSW were recorded as receiving antiretroviral treatment (hereafter referred to as treatment) from that service. Treatment was identified through records of prescriptions for antiretroviral medications). The total number of patients on treatment rose by 75% from 1,503 in 2007 to 2,627 in 2013.

Proportionally, 76% of HIV positive patients who attended a SHC in 2007 had received some treatment from that service, which rose to 81% in 2013. Importantly, these data only identify patients who received treatment at the SHC and does not account for patients treated elsewhere.

In 2007, 59% of HIV positive patients had an undetectable viral load (last viral load test in year was <50 RNA copies/mm^3), which increased 19% to 79% in 2013 (relative increase of 32%). Among HIV positive patients on treatment, the proportion with an undetectable viral load increased 8% from 80% in 2007 to 88% in 2013 (relative increase of 10%). In 2013, 10% of patients with HIV had viral loads greater than 10,000 RNA copies/mm^3 of blood, which was lower than the 19% in 2007 (9% decrease, relative decrease of 47%). Overall, the proportion of HIV positive patients with CD4 cell counts of 500 or more cells/mm^3 increased from 46% in 2007 to 64% in 2013 (18% increase, relative increase of 39%).

Regarding treatment, patients with HIV were organised into a 'care cascade' (**see Figure 40**). In the 2 years prior to 2013, 2,119 GBM with HIV attended a SHC at least once. Of those, 1,922 (91%) had a consultation in 2013, 1,653 (78%) received treatment for HIV from the clinic, and 1,570 (74%) achieved an undetectable viral load at their last test for the year.

Conclusions

The indicators relating to HIV testing show that the total number of tests increased annually, particularly at SHCs, with the greatest increase among GBM. This increase appears to be due to a number of factors: (i) more individual GBM patients being seen at services (expanded access); (ii) an increase in the proportion of attending patients offered testing (increased uptake) and (iii) the number of patients returning for a repeat test. These three indicators are likely to reflect the impact of different initiatives. Testing appears to be well targeted, with the greatest increases in testing in high risk GBM and the 0.9% of GBM testing positive in 2013.

At GP clinics with a high caseload of GBM, there was a smaller increase in HIV testing in GBM which appears to be due to more individual GBM being seen at clinics, with no change in the uptake of testing (only 49% of

[5] Zablotska I, Prestage GP, Middleton M, Wilson D, Grulich AE. Contemporary trends in HIV diagnoses in Australia can be predicted by trends in unprotected anal intercourse among gay men. 2010. *AIDS*, 24, 1955-1966.
[6] Centre for Social Research in Health. *Sydney Gay Community Periodic Survey, 2007-2014*. 2014. Sydney, NSW: UNSW Australia.

GBM clients had a test in 2013) and no change in repeat testing. Further strategies to increase the uptake of testing among GBM already attending the clinics are warranted (see *The eTEST Project: Final Report*[7]).

Regarding HIV treatment, the number and proportion of patients overall receiving treatment for HIV increased from 2007. HIV positive GBM were less likely than other patients to receive treatment from a sexual health centre, which may be because they are receiving treatment from other services, such as their GP or hospital-based clinics. The proportion of HIV positive patients with undetectable viral loads and CD4 cell counts greater than 500 cells per mm^3 of blood increased between 2007 and 2013. Overall 13% of HIV positive patients attending the SHCs in 2013 had viral loads of >10,000 RNA copies/mm^3 (11% among GBM). High viral load levels increase the risk of HIV transmission during condomless sex[8].

Finally, HIV incidence peaked in 2009 (3 years prior to the peak in HIV notifications), and then remained stable with an increase again in 2013. HIV incidence appears to reflect behavioural markers of condomless anal sex among GBM, highlighting their importance as early indicators of HIV transmission in the GBM community.

[7] Callander D, Bourne C, Pell C, Duck T, Roberts A, Cooper C, Stoové M, Hocking J, de Wit J, Kaldor J, Donovan B, Guy R. *The eTEST project: an initiative to enhance STI testing in gay men. Final Report*. 2014. Sydney, NSW: The Kirby Institute, UNSW Australia.

[8] Quinn TC, Wawer MJ, Sewankambo N, et al. Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group. *New England Journal of Medicine*. 2000;342(13):921-929.

Report notes

- The population group categories are not mutually exclusive. For example, a patient could be reported as both a GBM and also as an Aboriginal and/or Torres Strait Islander person.
- In 2009, one service changed their system of inputting pathology information and, for that year, reliable pathology data are not available. As such, the HIV testing data from that service have been excluded from this report but will be available in future iterations. All other sections (attendance; HIV management) include data from this service.
- Data relevant to GP clinics that see a high number of GBM (the "High caseload GP network") have been drawn from the surveillance arm of The eTEST Project. Data from eTEST extend back to 2011.

Overview of indicators and networks

Indicator	SHC Network	High caseload GP Network	GP Network
Unique patients attending	✔	✔	✔
Total HIV tests	✔	✔	✔
Unique patients tested for HIV	✔	✔	✔
Proportion tested for HIV (uptake)	✔	✔	✔
Re-testing for HIV among GBM	✔	✔	-
Biannual re-testing for HIV among high risk GBM	✔	-	-
HIV 'testing cascade'	✔	-	-
HIV positivity	✔	-	-
HIV incidence among GBM	✔	-	-
HIV positive patients on treatment	✔	-	-
HIV treatment and viral load	✔	-	-
HIV treatment and CD4 cell count	✔	-	-

Population	SHC Network	High caseload GP Network	GP Network
Overall by sex	✔	-	✔
Overall by age group	✔	✔	✔
GBM	✔	✔	-
Priority populations: **Aboriginal people** **People who inject drugs (PWID)** **Female sex workers (FSWs)**	✔	-	-

Definitions

Gay, bisexual and other men who have sex with men (GBM)	Male patients who report sex with another man or other men in the 12 months prior to consultation
High risk GBM[9]	Male patients who report more than 5 male sexual partners in the 3 months prior or more than 20 male sexual partners in the 12 months prior to consultation or who had a diagnosis of chlamydia, gonorrhoea or syphilis in the 24 months prior to and including consultation
Female sex worker (FSW)	Female patients who report selling sex in the 12 months prior to consultation
Aboriginal	Patients identified as Aboriginal, Torres Strait Islander, or both
People who inject drugs (PWID)	Patients who report injecting drugs in the 12 months prior to consultation

[9] 'High risk' defined in accordance with guidelines from the STI in Gay Men's Action Group, see: Templeton DJ, Read P, Varma R, Bourne C. Australian sexually transmissible infection and HIV testing guidelines for asymptomatic men who have sex with men 2014: a review of the evidence. *Sexual Health*. 2014;11(3):217-29.

Sexual health clinic network

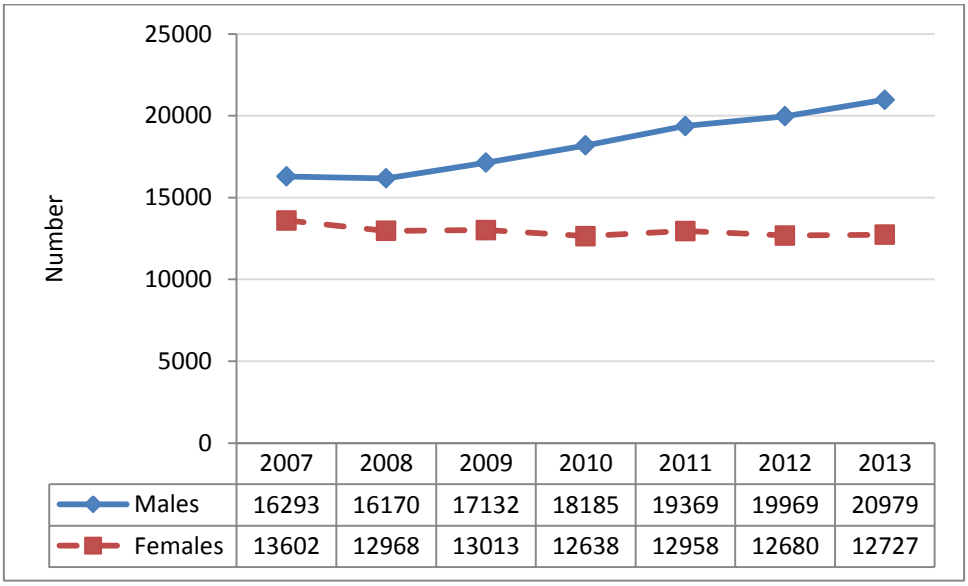
The data presented in this section of the report were drawn from the ACCESS SHC network, representing 14 services and 33 clinics in NSW (all services in the state except two). Where possible all data are presented in 12-month periods from 2007 to 2013 and stratified by sex, HIV status, age, GBM and among other priority populations. Indicators stratified by sexual risk behaviour are presented from 2009 given the availability of those data.

UNIQUE PATIENTS ATTENDING

These graphs represent the number of unique patients who attended a service at least in a year. Unique means a patient who is unique to a single clinic. Each clinic generates their own patient identiifier, which are not the same across clinics. This means if a person attends multiple services they would be counted twice.

Between 2007 and 2013, the number of patients attending a clinic increased by 13%. In males, there was a 29% increase between 2007 and 2013, and among females, the number of attending patients fell by 6%.

Figure 1: Number of **unique patients* seen** at sexual health clinics in NSW, by sex** and year, 2007-2013



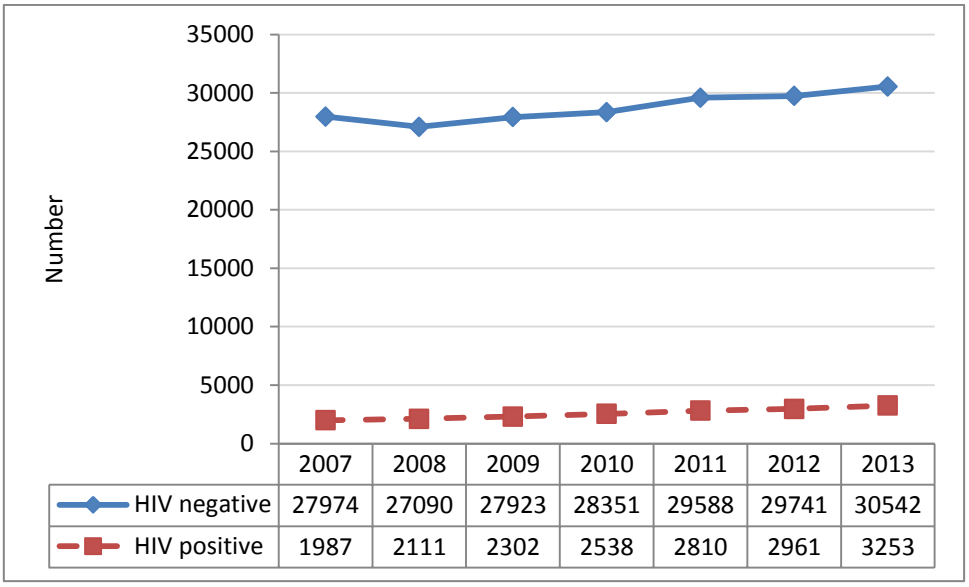
	2007	2008	2009	2010	2011	2012	2013
Males	16293	16170	17132	18185	19369	19969	20979
Females	13602	12968	13013	12638	12958	12680	12727

* 'Unique' patients were only identified within each service

**Does not include patients identified as transgender or of unknown sex

There was a greater increase in HIV positive patients seen compared to HIV negative patients. HIV positive patients seen at SHCs from 2007 to 2013 increased by 64%, whereas the number of HIV negative patients seen increased by 9%.

Figure 2: Number of **unique patients* seen** at sexual health clinics in NSW, by HIV status and year, 2007-2013

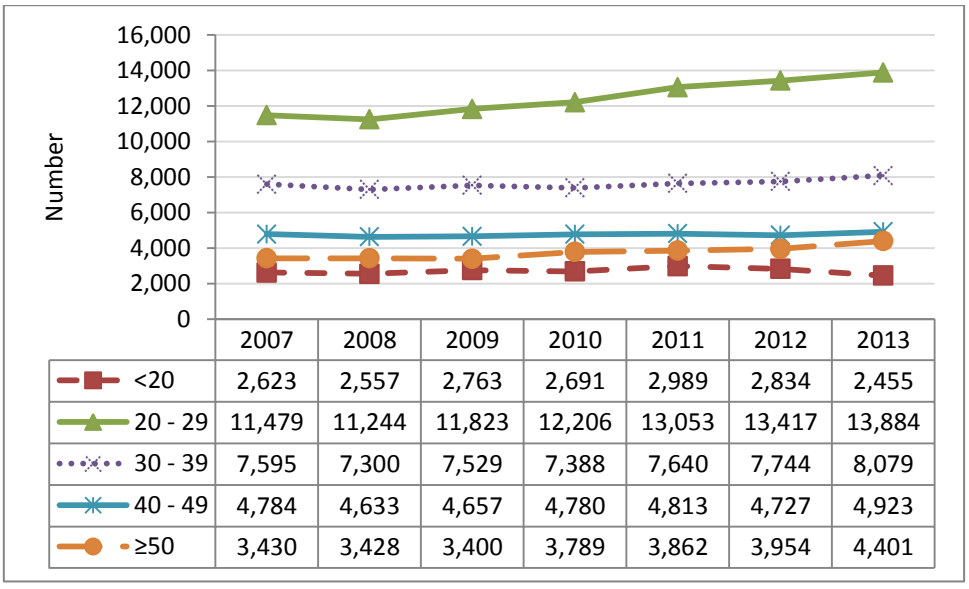


	2007	2008	2009	2010	2011	2012	2013
HIV negative	27974	27090	27923	28351	29588	29741	30542
HIV positive	1987	2111	2302	2538	2810	2961	3253

* 'Unique' patients were only identified within each service

Figure 3 shows that the majority of increase in the number of patients seen was among those aged 20-29 years, which increased by 21% from 2007 to 2013, while the number of attending patients aged 50 year and older increased by 28%.

Figure 3: Number of **unique patients* seen** at sexual health clinics in NSW, by age group, 2007-2013

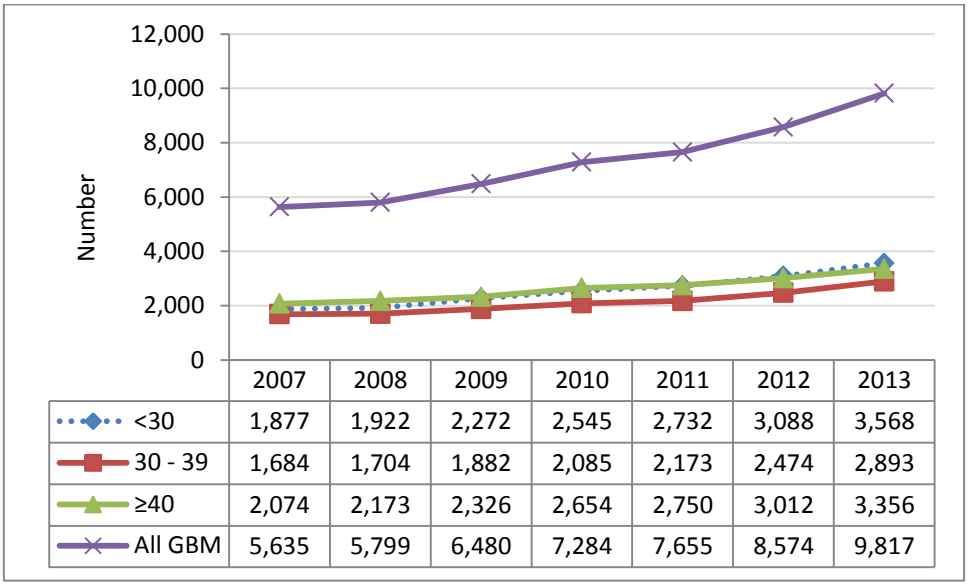


	2007	2008	2009	2010	2011	2012	2013
<20	2,623	2,557	2,763	2,691	2,989	2,834	2,455
20 - 29	11,479	11,244	11,823	12,206	13,053	13,417	13,884
30 - 39	7,595	7,300	7,529	7,388	7,640	7,744	8,079
40 - 49	4,784	4,633	4,657	4,780	4,813	4,727	4,923
≥50	3,430	3,428	3,400	3,789	3,862	3,954	4,401

* 'Unique' patients were only identified within each service

Figure 4 shows an increase in the number of GBM seen at SHCs in NSW, which rose by 74% between 2007 and 2013. Increases were observed in all age groups.

Figure 4: Number of **unique GBM* seen** at sexual health clinics in NSW, overall and by age group and year, 2007-2013

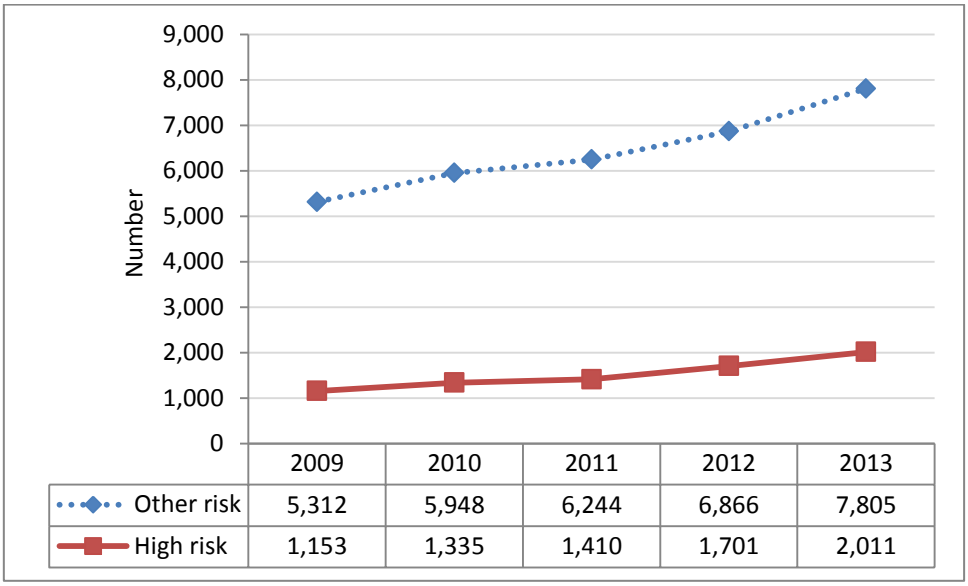


	2007	2008	2009	2010	2011	2012	2013
<30	1,877	1,922	2,272	2,545	2,732	3,088	3,568
30 - 39	1,684	1,704	1,882	2,085	2,173	2,474	2,893
≥40	2,074	2,173	2,326	2,654	2,750	3,012	3,356
All GBM	5,635	5,799	6,480	7,284	7,655	8,574	9,817

* 'Unique' patients were only identified within each service

There was a 74% increase in high risk GBM who attended SHCs between 2009 and 2013 (Figure 5). Table 1 includes the number and proportion of all GBM who, by year, reported more than 5 partners in last 3 months or more than 20 partners in last 12 months or a diagnosis of an STI in last 24 months.

Figure 5: Number of **unique GBM* seen** at sexual health clinics in NSW, by risk category** and year, 2009-2013***



	2009	2010	2011	2012	2013
Other risk	5,312	5,948	6,244	6,866	7,805
High risk	1,153	1,335	1,410	1,701	2,011

*'Unique' patients were only identified within each service

** 'High risk' men are those with >5 partners in the 3 months prior, or >20 partners in the 12 months prior, or a chlamydia, gonorrhoea or syphilis diagnosis in the 24 months prior

**Complete data on partner numbers only available from 2009 onward

Table 1: Indicators* of 'high risk'** **among GBM patients**, overall and by HIV status and year, 2009-2013***

	Year n (%)				
Overall	**2009**	**2010**	**2011**	**2012**	**2013**
>5 partners in 3 months†	866 (13)	1066 (15)	1133 (15)	1384 (16)	1641 (17)
>20 partners in 12 months	566 (9)	687 (9)	689 (9)	871 (10)	1063 (11)
STI diagnosis in previous 24 months‡	216 (3)	231 (3)	205 (3)	240 (3)	315 (3)
Total high risk GBM	1153 (18)	1335 (18)	1410 (18)	1701 (20)	2011 (21)
HIV negative GBM	**2009**	**2010**	**2011**	**2012**	**2013**
>5 partners in 3 months†	773 (16)	956 (17)	1002 (17)	1232 (19)	1464 (19)
>20 partners in 12 months	488 (10)	610 (11)	604 (11)	757 (12)	928 (12)
STI diagnosis in previous 24 months‡	151 (3)	164 (3)	147 (3)	166 (3)	219 (3)
Total (HIV negative) high risk GBM	996 (21)	1166 (21)	1214 (21)	1470 (23)	1744 (23)
HIV positive GBM	**2009**	**2010**	**2011**	**2012**	**2013**
>5 partners in 3 months†	93 (6)	110 (6)	131 (7)	152 (8)	177 (8)
>20 partners in 12 months	78 (5)	77 (4)	85 (5)	114 (6)	135 (6)
STI diagnosis in previous 24 months‡	65 (4)	67 (4)	58 (3)	74 (4)	92 (4)
Total (HIV positive) high risk GBM	157 (10)	169 (9)	196 (11)	231 (12)	267 (12)

*Indicators are not mutually exclusive

**See *Definitions* for information about risk classification among GBM

*** Complete data on partner numbers only available from 2009 onward

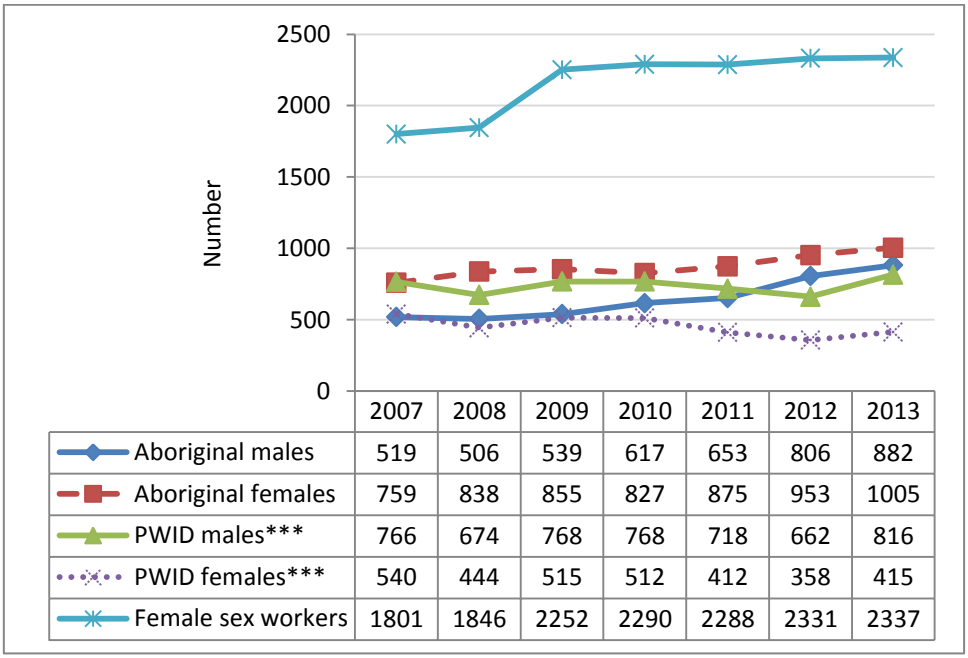
† Refers to months prior to last consultation of each year

‡Positive result or diagnosis for chlamydia, gonorrhoea or syphilis

Between 2007 and 2013, the number of Aboriginal males seen at SHCs increased by 70% (Figure 6), while the number of Aboriginal females increased by 32%. The numbers of FSWs increased by 30% between 2007 and 2013, while the number of attending male PWID increased by 7% and female PWID decreased by 23%.

Please note data from one SHC that sees a large number of PWID were not included in this report.

Figure 6: Number of **unique patients* seen** at sexual health clinics in NSW, by priority population** other than GBM and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Aboriginal males	519	506	539	617	653	806	882
Aboriginal females	759	838	855	827	875	953	1005
PWID males***	766	674	768	768	718	662	816
PWID females***	540	444	515	512	412	358	415
Female sex workers	1801	1846	2252	2290	2288	2331	2337

*'Unique' patients were only identified within each service

**Priority classifications are not mutually exclusive. See *Definitions* for classification details

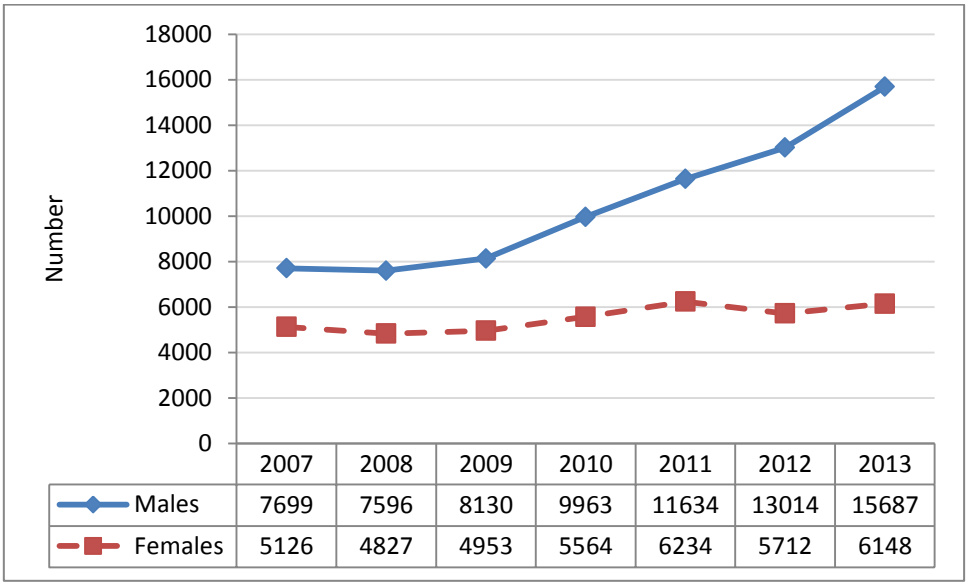
***PWID=People who inject drugs

TOTAL HIV TESTS

Total HIV tests reflect the absolute number of HIV tests conducted per year, which might include multiple tests for the same patient. Multiple HIV tests conducted on the same day, however, were only counted once. Data from one service were excluded from this section because of incomplete HIV testing data from 2009.

Overall, the total number of HIV tests increased by 72% between 2007 and 2013, with a 104% increase among male patients and a 20% increase among female patients (Figure 7).

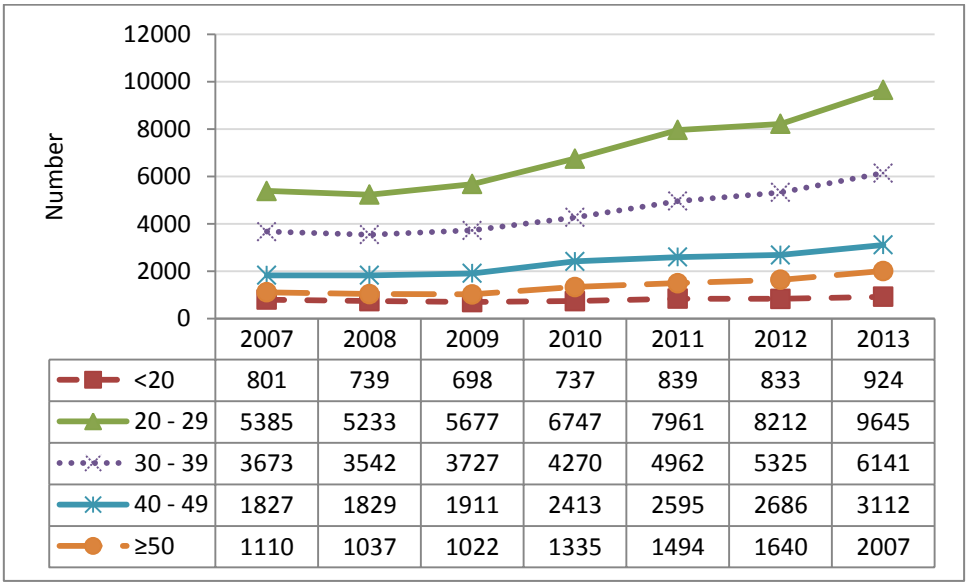
Figure 7: Total **number of HIV tests** in patients seen at sexual health clinics in NSW, by sex and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Males	7699	7596	8130	9963	11634	13014	15687
Females	5126	4827	4953	5564	6234	5712	6148

Figures 8 shows that between 2007 and 2013 the number of HIV tests increased among all age groups.

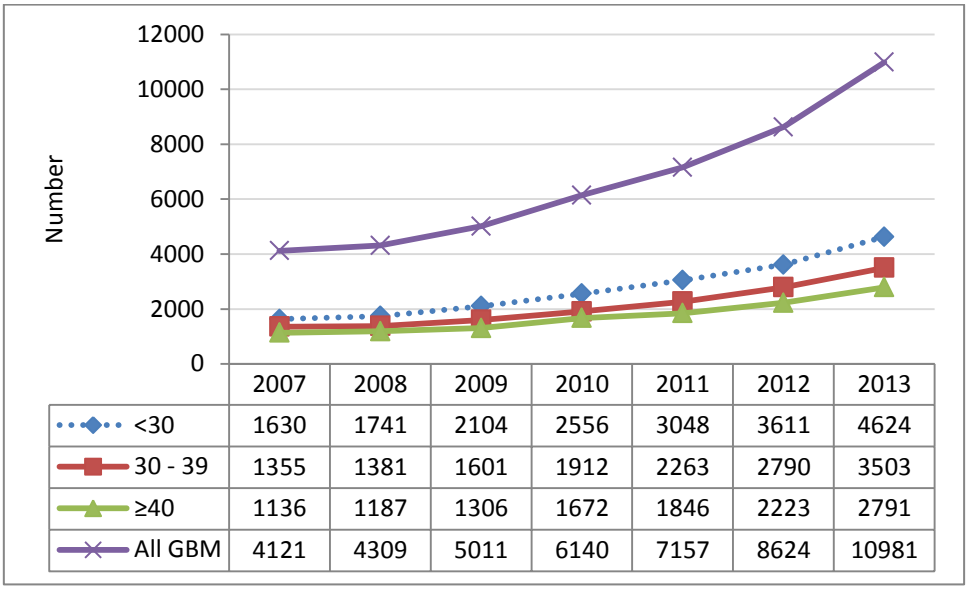
Figure 8: Total **number of HIV tests** in patients seen at sexual health clinics in NSW, by age group and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
<20	801	739	698	737	839	833	924
20 - 29	5385	5233	5677	6747	7961	8212	9645
30 - 39	3673	3542	3727	4270	4962	5325	6141
40 - 49	1827	1829	1911	2413	2595	2686	3112
≥50	1110	1037	1022	1335	1494	1640	2007

Figure 9 shows that the total number of HIV tests in GBM overall increased by 166% between 2007 and 2013. There was steady increase over time in all 3 age groups; by 184% among men under 30 years old, 159% in men aged 30 – 39 years, and by 146% among men 40 years and older.

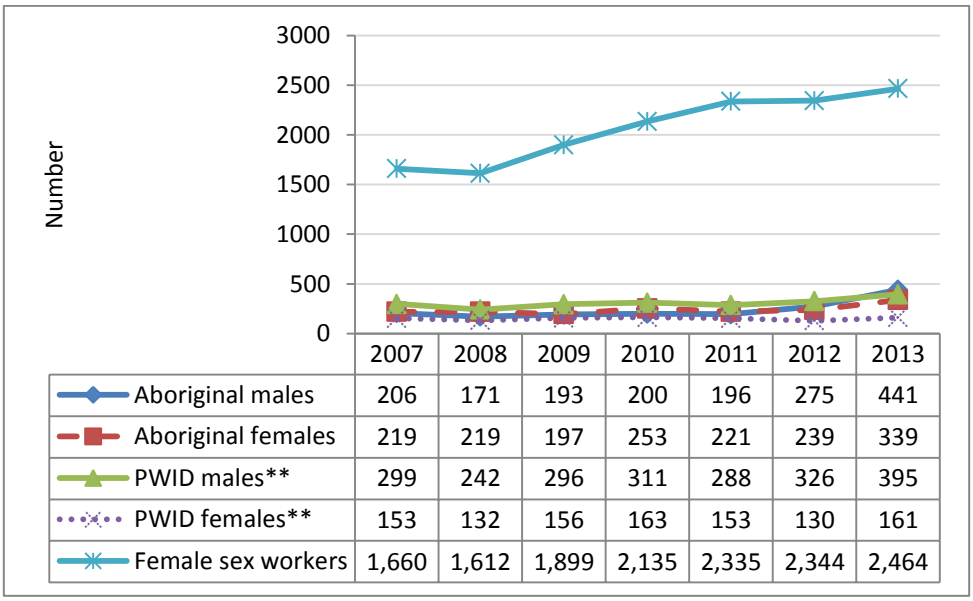
Figure 9: Total **number of HIV tests** in GBM seen at sexual health clinics in NSW, overall and by age group and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
<30	1630	1741	2104	2556	3048	3611	4624
30 - 39	1355	1381	1601	1912	2263	2790	3503
≥40	1136	1187	1306	1672	1846	2223	2791
All GBM	4121	4309	5011	6140	7157	8624	10981

Among FSWs there was a steady 48% increase in the number of HIV tests between 2007 and 2013. Among other priority populations there were fewer tests and increases were mainly observed from 2012 – 2013.

Figure 10: Total **number of HIV tests** in patients seen at sexual health clinics in NSW, by priority population* other than GBM and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Aboriginal males	206	171	193	200	196	275	441
Aboriginal females	219	219	197	253	221	239	339
PWID males**	299	242	296	311	288	326	395
PWID females**	153	132	156	163	153	130	161
Female sex workers	1,660	1,612	1,899	2,135	2,335	2,344	2,464

*Priority classifications are not mutually exclusive. See *Definitions* for classification details

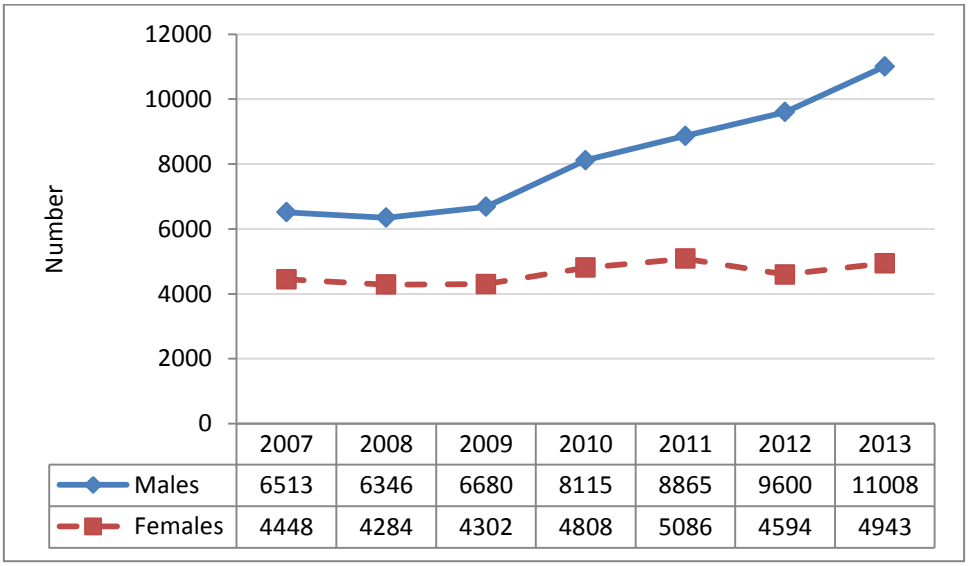
**PWID=People who inject drugs

UNIQUE PATIENTS TESTED FOR HIV

The following graphs show the number of unique patients tested for HIV annually and the changes between 2007 and 2013. As with the previous section, 'unique' refers to patients within each service. Thus, if a patient were tested at more than one clinic they were counted multiple times. If, however, a patient tested more than once at the same clinic then they were only counted once.

There was a 69% increase in the number of individual males tested for HIV at NSW SHCs between 2007 and 2013 and an 11% increase in the number of individual female patients tested.

Figure 11: Number of **unique patients* tested** for HIV at sexual health clinics in NSW, by sex** and year, 2007-2013

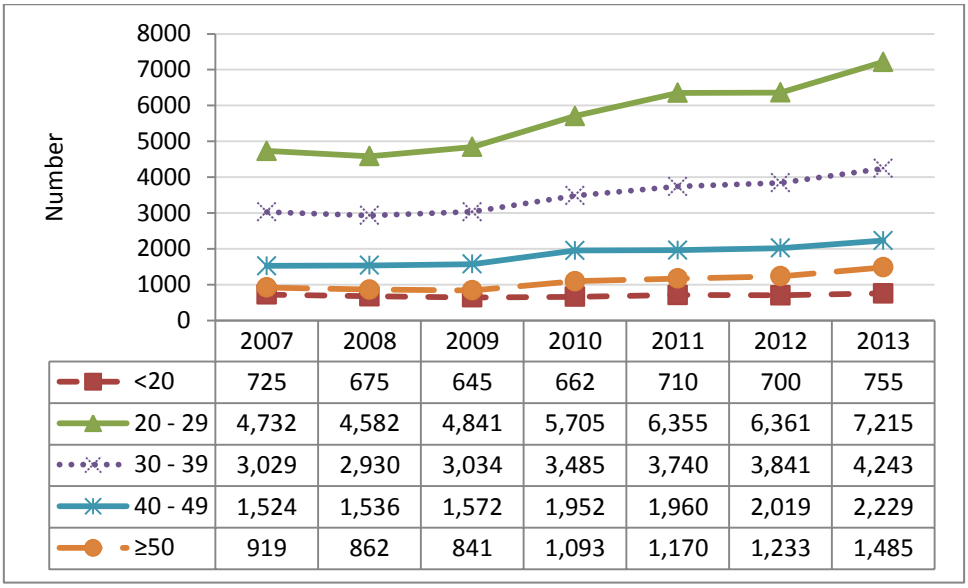


	2007	2008	2009	2010	2011	2012	2013
Males	6513	6346	6680	8115	8865	9600	11008
Females	4448	4284	4302	4808	5086	4594	4943

* 'Unique' patients were only identified within each service
**Does not include patients identified as transgender or of unknown sex

The highest increase (62%) in the number of unique patients tested for HIV was among those aged 50 years and older (Figure 12). Among patients aged 20 – 29 years, there was a 52% increase in patients tested between 2007 and 2013.

Figure 12: Number of **unique patients* tested** for HIV at sexual health clinics in NSW, by age group, 2007-2013

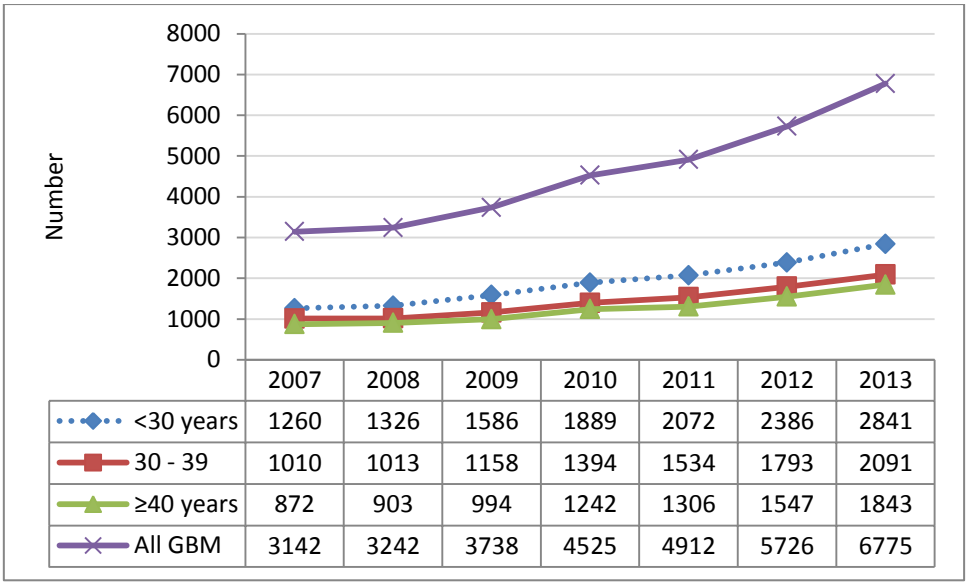


	2007	2008	2009	2010	2011	2012	2013
<20	725	675	645	662	710	700	755
20 - 29	4,732	4,582	4,841	5,705	6,355	6,361	7,215
30 - 39	3,029	2,930	3,034	3,485	3,740	3,841	4,243
40 - 49	1,524	1,536	1,572	1,952	1,960	2,019	2,229
≥50	919	862	841	1,093	1,170	1,233	1,485

* 'Unique' patients were only identified within each service

The number of GBM patients tested between 2007 and 2013 rose by 116% with the greatest increase (125%) observed among patients under 30 years old (Figure 13). Since 2007, the average number of HIV tests per GBM patient per year increased from 1.3 tests in 2007, to 1.6 tests in 2013.

Figure 13: Number of **unique GBM* tested** for HIV at sexual health clinics in NSW, overall and by age group and year, 2007-2013

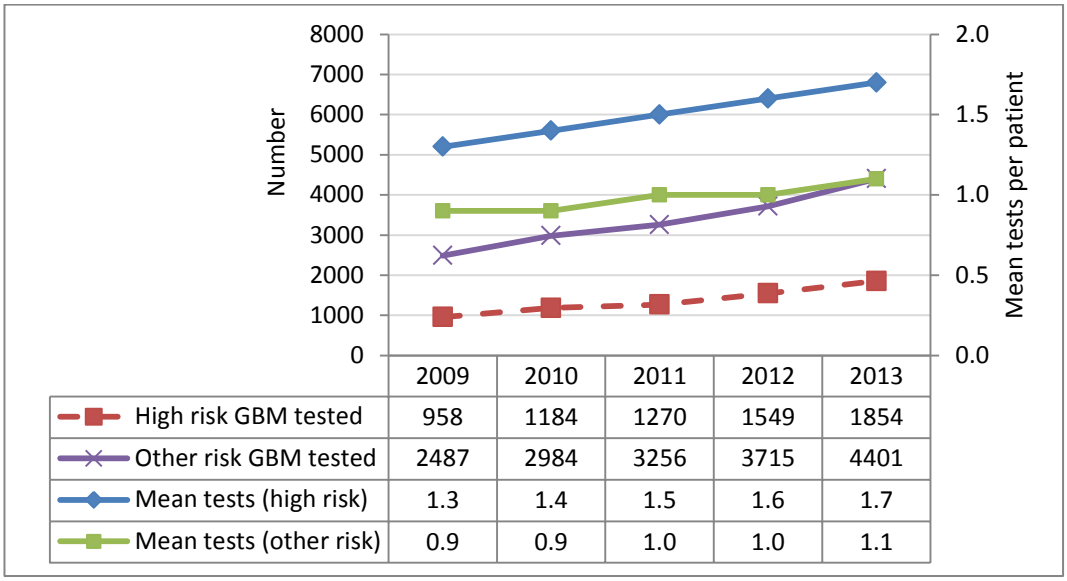


	2007	2008	2009	2010	2011	2012	2013
<30 years	1260	1326	1586	1889	2072	2386	2841
30 - 39	1010	1013	1158	1394	1534	1793	2091
≥40 years	872	903	994	1242	1306	1547	1843
All GBM	3142	3242	3738	4525	4912	5726	6775

* 'Unique' patients were only identified within each service

Between 2009 and 2013 there was an 84% increase in the number of individual high risk GBM tested for HIV and an 80% increase among men with other risk profiles. The average number of tests per patient also increased, rising 31% among high risk GBM and 22% among other risk men.

Figure 14: Number of unique GBM* tested for HIV and mean number of tests per patient per year at sexual health clinics in NSW, overall and by risk classification** and year, 2009-2013***



	2009	2010	2011	2012	2013
High risk GBM tested	958	1184	1270	1549	1854
Other risk GBM tested	2487	2984	3256	3715	4401
Mean tests (high risk)	1.3	1.4	1.5	1.6	1.7
Mean tests (other risk)	0.9	0.9	1.0	1.0	1.1

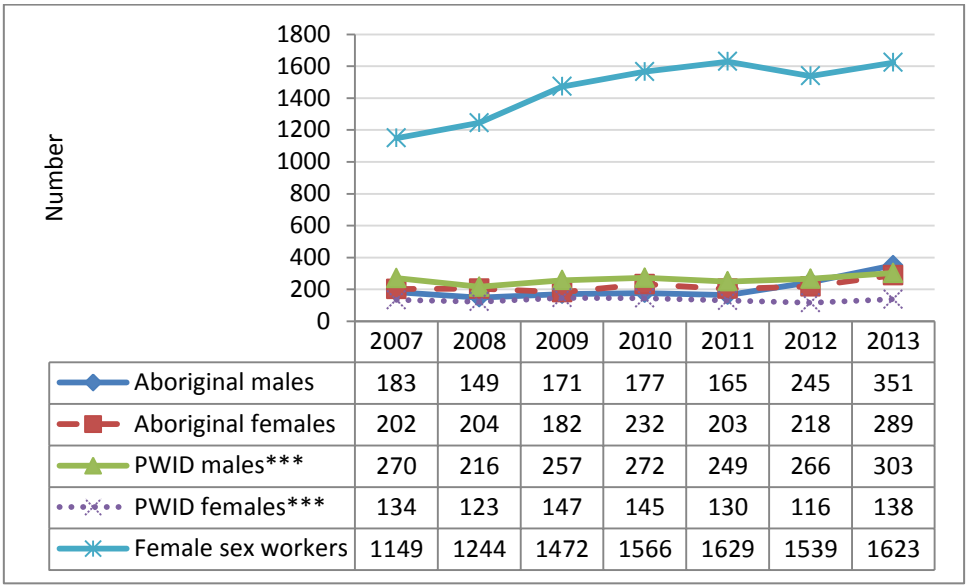
* 'Unique' patients were only identified within each service

** 'High risk' men are those with >5 partners in the 3 months prior, or >20 partners in the 12 months prior, or a chlamydia, gonorrhoea or syphilis diagnosis in the 24 months prior (see Table 1)

*** Complete data on partner numbers only available from 2009 onward

The number of unique FSWs who were tested for HIV increased by 41% from 2007 to 2013. There was a 92% increase in number of unique Aboriginal males tested for HIV at NSW SHCs, largely due to increases in 2012 – 2013.

Figure 15: Number of **unique patients* tested** for HIV at sexual health clinics in NSW, by priority population* other than GBM and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Aboriginal males	183	149	171	177	165	245	351
Aboriginal females	202	204	182	232	203	218	289
PWID males***	270	216	257	272	249	266	303
PWID females***	134	123	147	145	130	116	138
Female sex workers	1149	1244	1472	1566	1629	1539	1623

* 'Unique' patients were only identified within each service

**Priority classifications are not mutually exclusive. See *Definitions* for classification details

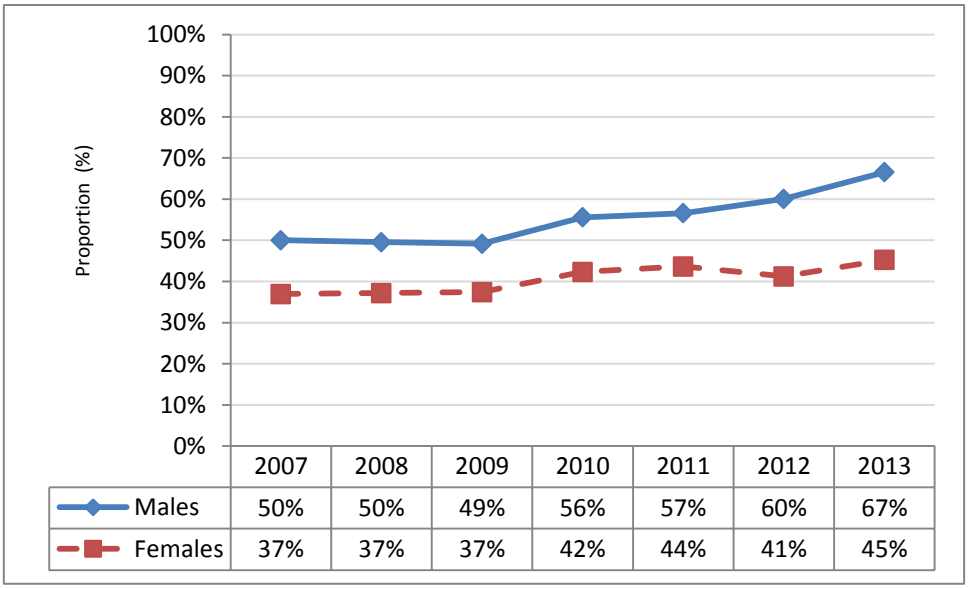
***PWID=People who inject drugs

PROPORTION TESTED FOR HIV (UPTAKE)

This section details the proportion of unique HIV negative patients who attended the SHC at least once in a 12-month period and received one or more tests for HIV (HIV testing uptake). Each year is presented as a cross-sectional snapshot of the people attending a clinic and calculations the proportion who had at least one test for HIV.

There have been differential increases in this indicator across demographics groups and priority populations but the most prominent were among male patients. Among male clinic attendees the proportion tested for HIV increased by 17% between 2007 and 2013 (34% relative increase), whereas uptake among female patients increased 8% (22% relative increase).

Figure 16: Proportion of **unique patients***attending a sexual health clinic in NSW who were tested for HIV in a year, by sex and year, 2007-2013

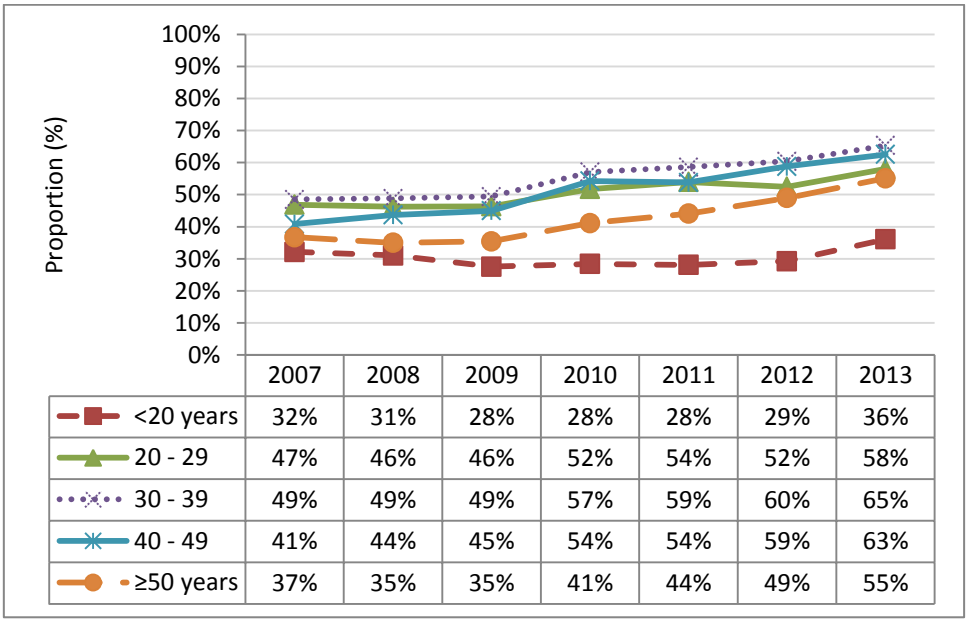


	2007	2008	2009	2010	2011	2012	2013
Males	50%	50%	49%	56%	57%	60%	67%
Females	37%	37%	37%	42%	44%	41%	45%

* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals

Figure 17 shows the proportion of unique patients tested for HIV at NSW SHCs by age group. The greatest increase in HIV testing uptake was seen among those aged 40 – 49 years (22% increase; 54% relative increase), followed by those 50 years and older (18% increase; 49% relative increase), and those aged 30 – 39 years (16% increase; 33% relative increase).

Figure 17: Proportion of **unique patients***attending a sexual health clinic in NSW who were tested for HIV in a year, by age group and year, 2007-2013

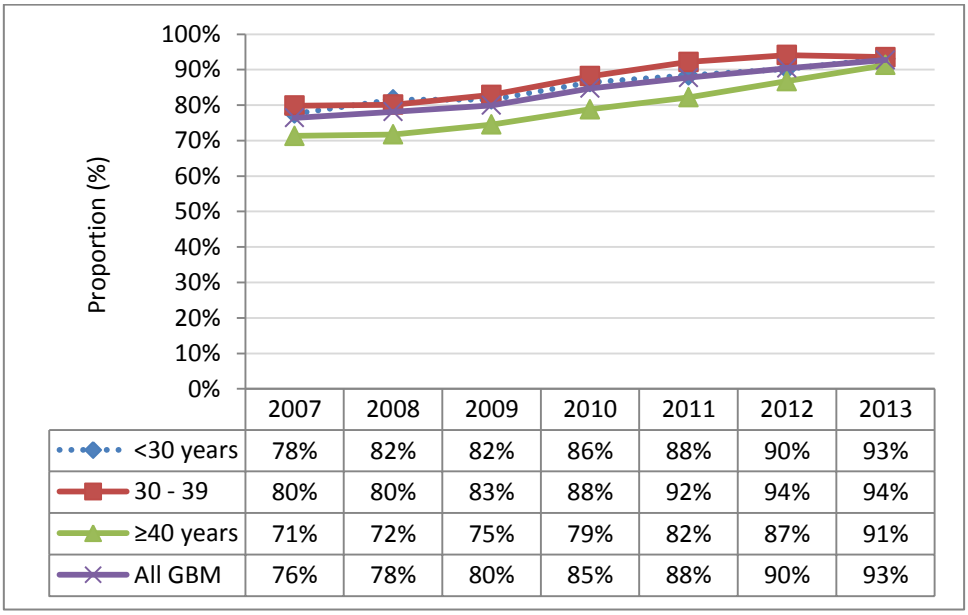


	2007	2008	2009	2010	2011	2012	2013
<20 years	32%	31%	28%	28%	28%	29%	36%
20 - 29	47%	46%	46%	52%	54%	52%	58%
30 - 39	49%	49%	49%	57%	59%	60%	65%
40 - 49	41%	44%	45%	54%	54%	59%	63%
≥50 years	37%	35%	35%	41%	44%	49%	55%

* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals

Figure 18 details the proportion of unique GBM tested for HIV, which increased 17% from 2007 to 2013 (22% relative increase). The increase was greatest among men aged 40 years and older, which increased 20%, a 28% relative increase.

Figure 18: Proportion of **unique GBM***attending a sexual health clinic in NSW who were tested for HIV in a year, by age group and year, 2007-2013

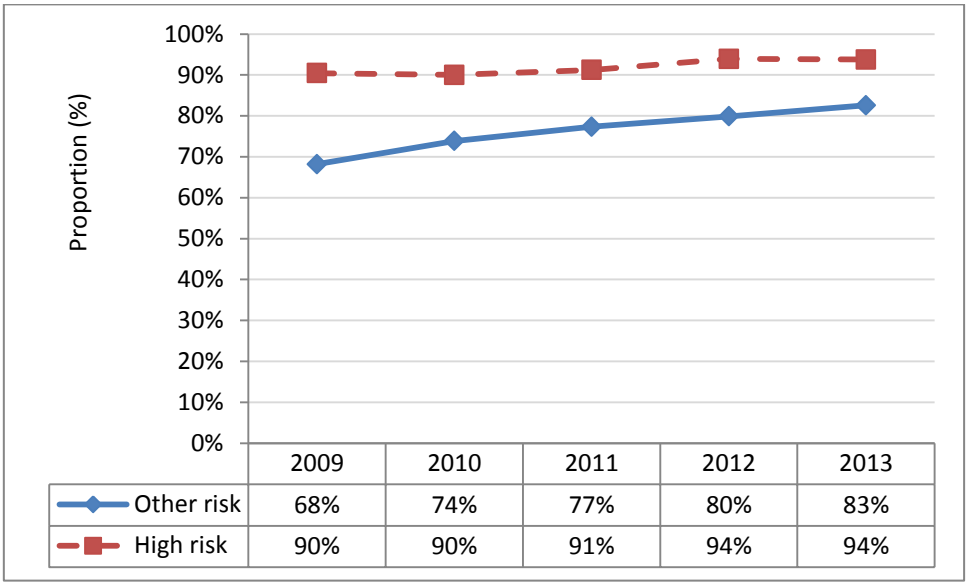


	2007	2008	2009	2010	2011	2012	2013
<30 years	78%	82%	82%	86%	88%	90%	93%
30 - 39	80%	80%	83%	88%	92%	94%	94%
≥40 years	71%	72%	75%	79%	82%	87%	91%
All GBM	76%	78%	80%	85%	88%	90%	93%

* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals

The uptake of HIV testing among high risk GBM increased 4% from 2007 to 2013 (4% relative increase), and 15% among GBM with other risk profiles (22% relative increase).

Figure 19: Proportion of **unique GBM***attending a sexual health clinic in NSW who were tested for HIV in a year, by risk category** and year, 2007-2013***

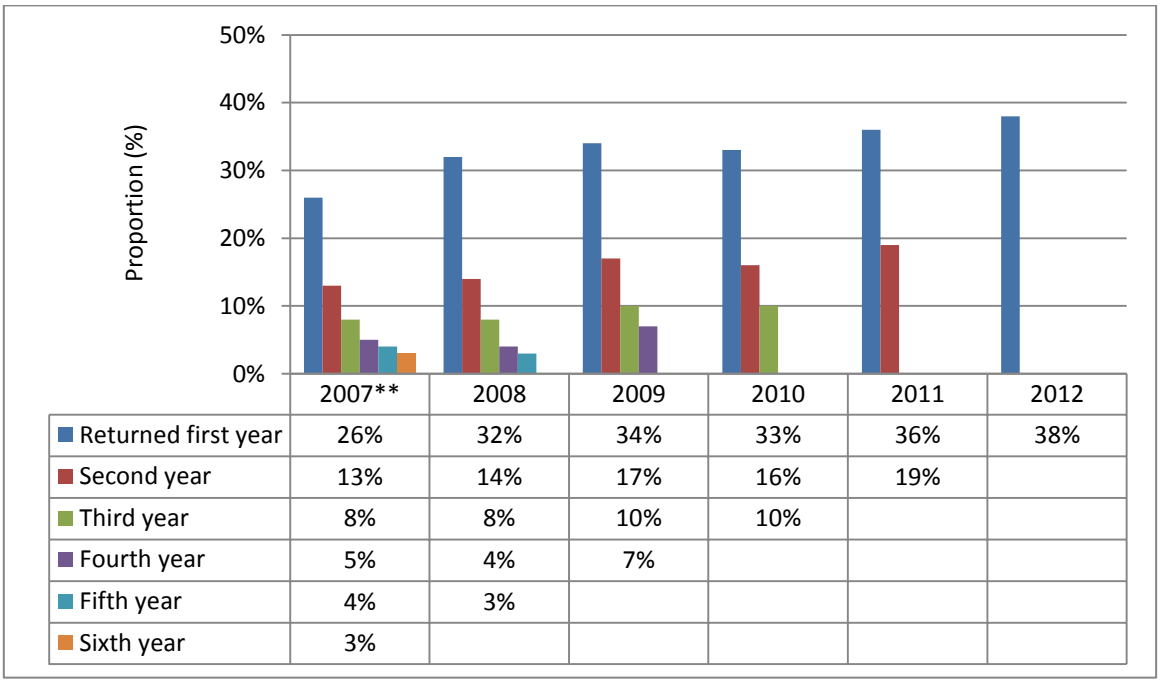


	2009	2010	2011	2012	2013
Other risk	68%	74%	77%	80%	83%
High risk	90%	90%	91%	94%	94%

* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals
**'High risk' men are those with >5 partners in the 3 months prior, or >20 partners in the 12 months prior, or a chlamydia, gonorrhoea or syphilis diagnosis in the 24 months prior (see Table 1)
***Complete data on partner numbers only available from 2009 onward

Figure 20 outlines a longitudinal analysis of annual HIV testing. Each year represents the first year an individual was tested at a service and the proportions represent the number who returned each year for a re-test at the same service. For example, in 2007, 26% of HIV-negative GBM had an HIV test in two consecutive years (2007-2008), 8% in three consecutive years (2007-2009) and 3% in six consecutive years. Over time, it appears that the proportion of men re-tested each year has increased. For example in 2011, 36% of GBM had a HIV test in two consecutive years (2011-2012) and 19% three consecutive years (2011-2013). Patients identified as travellers in the dataset were excluded from this analysis.

Figure 20. Proportion of HIV negative GBM* tested for HIV at least once each year, by year of initial test, 2007-2012 (follow-up period included 2013)

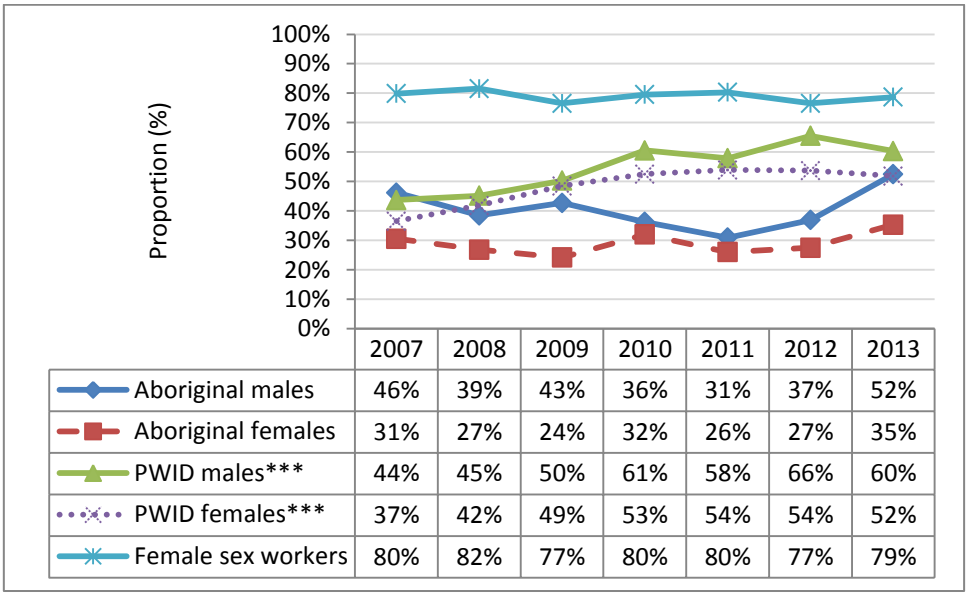


	2007**	2008	2009	2010	2011	2012
Returned first year	26%	32%	34%	33%	36%	38%
Second year	13%	14%	17%	16%	19%	
Third year	8%	8%	10%	10%		
Fourth year	5%	4%	7%			
Fifth year	4%	3%				
Sixth year	3%					

* Accounts only for patients re-tested at the same service
** Represents year of first HIV test at service

Figure 21 shows that among other priority populations testing uptake was highest in FSWs and remained steady over time (80% in 2007 and 79% in 2013). Testing uptake was lower overall in PWID but between 2007 and 2013 increased by 16% and 15% among males and females respectively (relative increases of 36% and 41%).

Figure 21: Proportion of **unique patients***attending a sexual health clinic in NSW who were tested for HIV in a year, by priority population** other than GBM and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Aboriginal males	46%	39%	43%	36%	31%	37%	52%
Aboriginal females	31%	27%	24%	32%	26%	27%	35%
PWID males***	44%	45%	50%	61%	58%	66%	60%
PWID females***	37%	42%	49%	53%	54%	54%	52%
Female sex workers	80%	82%	77%	80%	80%	77%	79%

* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals

**Priority classifications are not mutually exclusive. See *Definitions* for classification details

***PWID=People who inject drugs

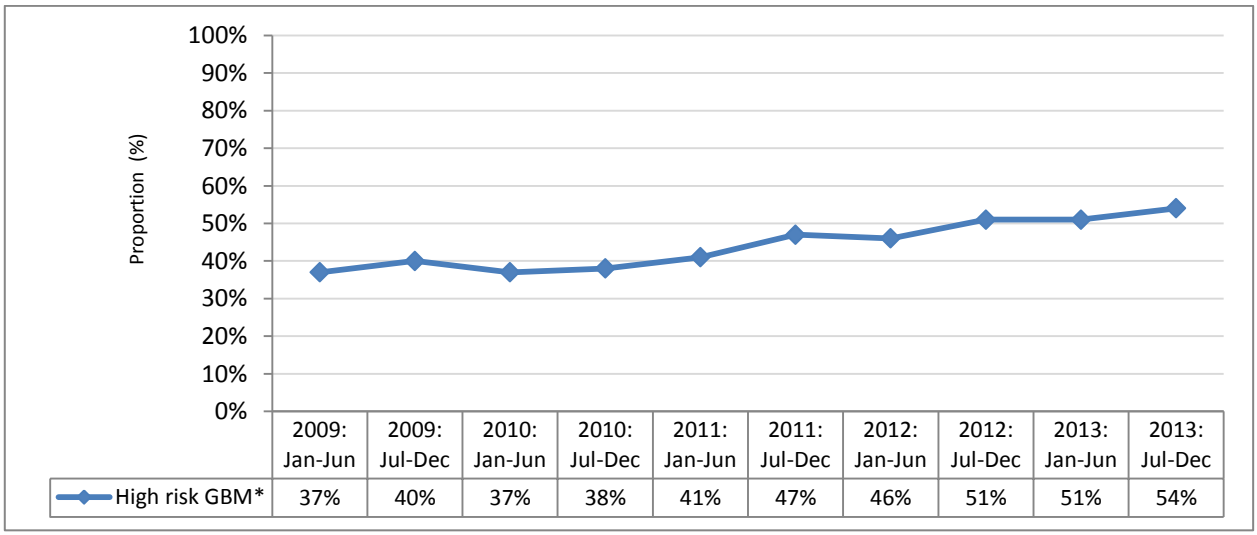
RE-TESTING FOR HIV AMONG GBM

Sexual health testing guidelines recommend annual testing for HIV among sexually-active GBM and 3 – 6 monthly testing among men whose sexual practices put them at higher risk for HIV and other STIs[10].

Figure 22 reports on re-testing for HIV among GBM, specifically the proportion of high risk GBM who returned within 6 months (plus 1 month grace period) for a repeat HIV test. Patients whose initial test for HIV was positive, were excluded. Tests conducted within 6 weeks of a previous HIV test were also excluded. These data only represent the proportion of GBM who were re-tested at the same health service.

Between the start of 2009 and the end of 2013, the proportion of high risk GBM who received 1 or more HIV tests within 6 months of an initial test increased 17% (relative increase of 46%).

Figure 22: Proportion of **high risk GBM** re-tested at the same clinic within 6 months (plus 1 month grace period) of an initial test** at sexual health clinics in NSW, by 6-month period***, 2009-2013



	2009: Jan-Jun	2009: Jul-Dec	2010: Jan-Jun	2010: Jul-Dec	2011: Jan-Jun	2011: Jul-Dec	2012: Jan-Jun	2012: Jul-Dec	2013: Jan-Jun	2013: Jul-Dec
High risk GBM*	37%	40%	37%	38%	41%	47%	46%	51%	51%	54%

*Excludes patients diagnosed with HIV

**High risk men are those with >5 partners in the 3 months prior, or >20 partners in the 12 months prior, or a chlamydia, gonorrhoea or syphilis diagnosis in the 24 months prior (see Table 1)

***The time period reflects the date of the initial test

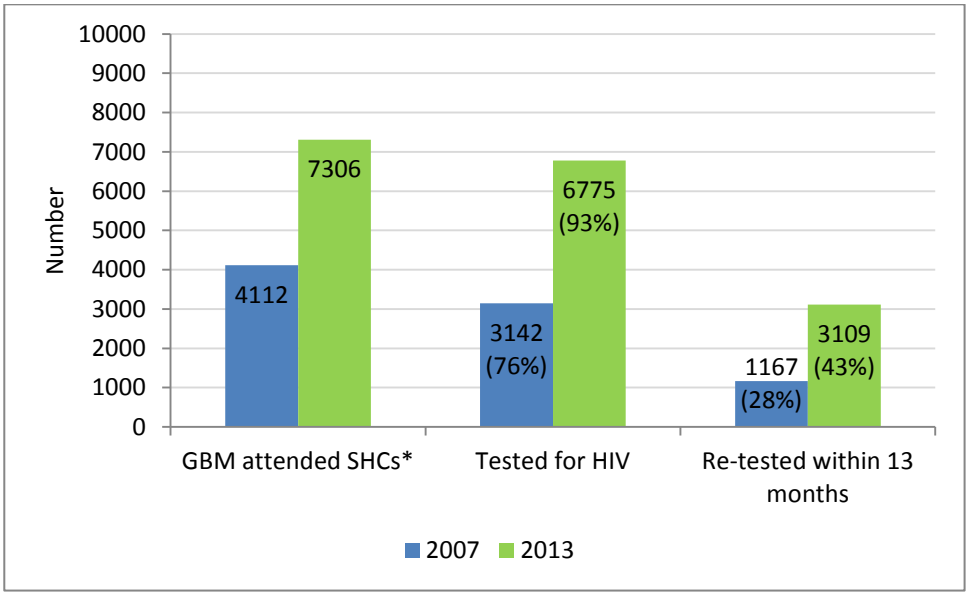
[10] Templeton DJ, Read P, Varma R, Bourne C. Australian sexually transmissible infection and HIV testing guidelines for asymptomatic men who have sex with men 2014: a review of the evidence. *Sexual Health*. 2014;11(3):217-29.

HIV 'TESTING CASCADE'

The following section details the HIV 'testing cascade' for GBM attending sexual health services in NSW. The cascade offers a visual representation of the numbers and proportions of HIV negative men who attended a service, were tested for HIV, and received a subsequent test within 13 months (12 months plus 1 month grace period). Between 2007 and 2013, the proportion of attending GBM tested for HIV and the proportion re-tested within 13 months increased considerably.

Of the 4,112 HIV negative GBM who attended a NSW SHC in 2007, 76% were tested for HIV and 28% received a re-test at the same service within 13 months. In 2013, a higher number of GBM were seen at the clinics (n=7,306), of whom 93% were tested for HIV and 43% were re-tested at the same service within 13 months.

Figure 23: HIV **'testing cascade' for GBM** attending sexual health clinics in NSW, 2007 and 2013



*Excludes patients with HIV

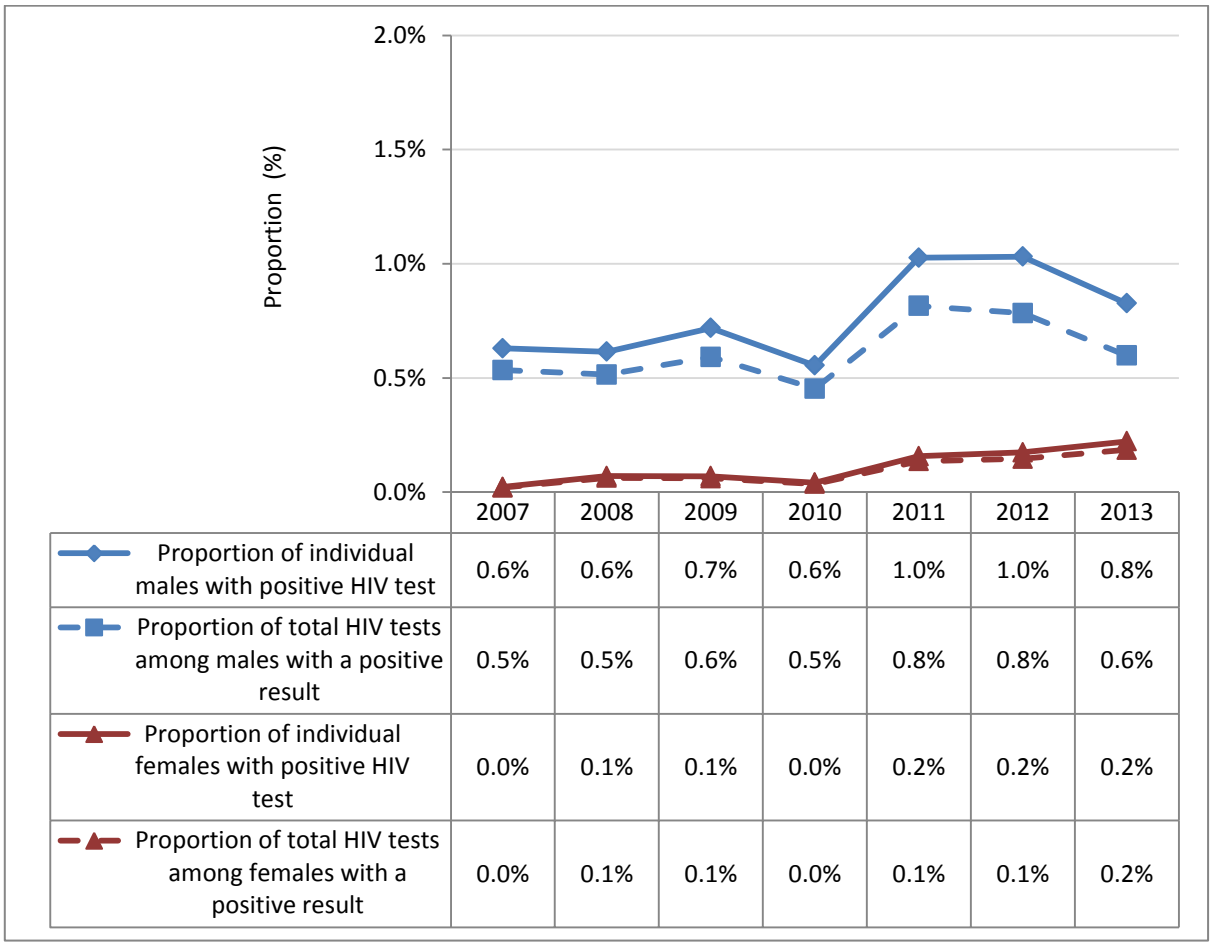
HIV POSITIVITY

This section reports on positive results for HIV. 'New' positive results exclude confirmatory tests for HIV (i.e., HIV tests among patients already known to be HIV positive).

The following graphs detail HIV positivity in 12-month periods. Positivity is presented in two ways. 'Non-unique positivity' calculates the *proportion of HIV tests overall which returned positive results* and includes multiple tests for the same person, whereas 'unique positivity' calculates the *proportion of unique individuals tested each year with positive results*.

Overall, unique positivity remained low among female patients (≤0.2% each year), and fluctuated between 0.6% and 1.0% among male patients.

Figure 24: Proportion of total HIV tests with positive results and proportion of **unique patients tested** for HIV with a positive result at sexual health clinics in NSW, by sex and year, 2007-2013



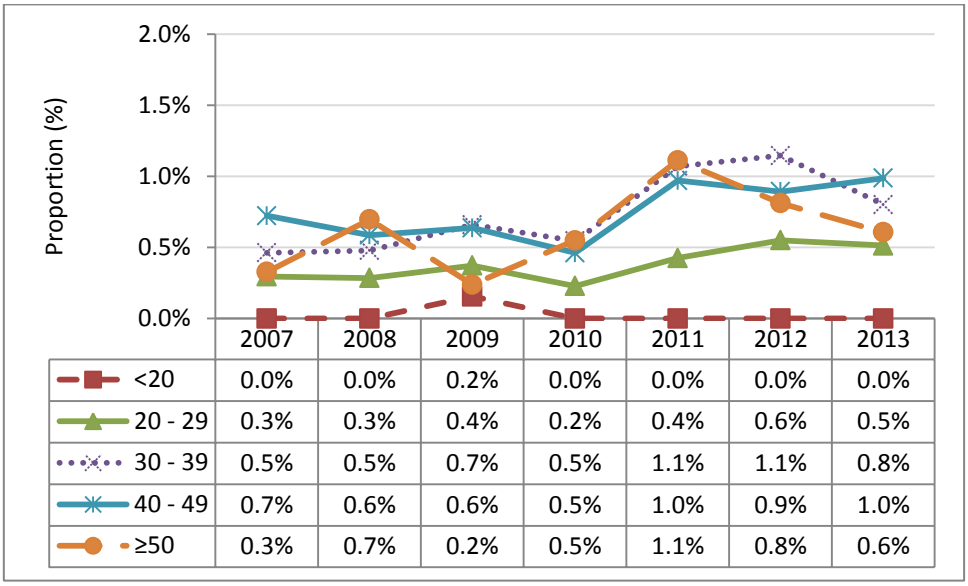
	2007	2008	2009	2010	2011	2012	2013
Proportion of individual males with positive HIV test	0.6%	0.6%	0.7%	0.6%	1.0%	1.0%	0.8%
Proportion of total HIV tests among males with a positive result	0.5%	0.5%	0.6%	0.5%	0.8%	0.8%	0.6%
Proportion of individual females with positive HIV test	0.0%	0.1%	0.1%	0.0%	0.2%	0.2%	0.2%
Proportion of total HIV tests among females with a positive result	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.2%

Table 2: Number of positive HIV test results, by sex and year, 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Male patients	41	39	48	45	91	99	91
Female patients	1	3	3	2	8	8	11

In 2013, the proportion of unique patients tested positive for HIV was highest in 40 – 49 years olds (1.0%, a 43% relative increase from 2007), followed by 30 – 39 years old (0.8%, a 60% relative increase from 2007).

Figure 25: Proportion of **unique patients* tested** for HIV with a positive HIV test result at sexual health clinics in NSW, by age group and year, 2007-2013

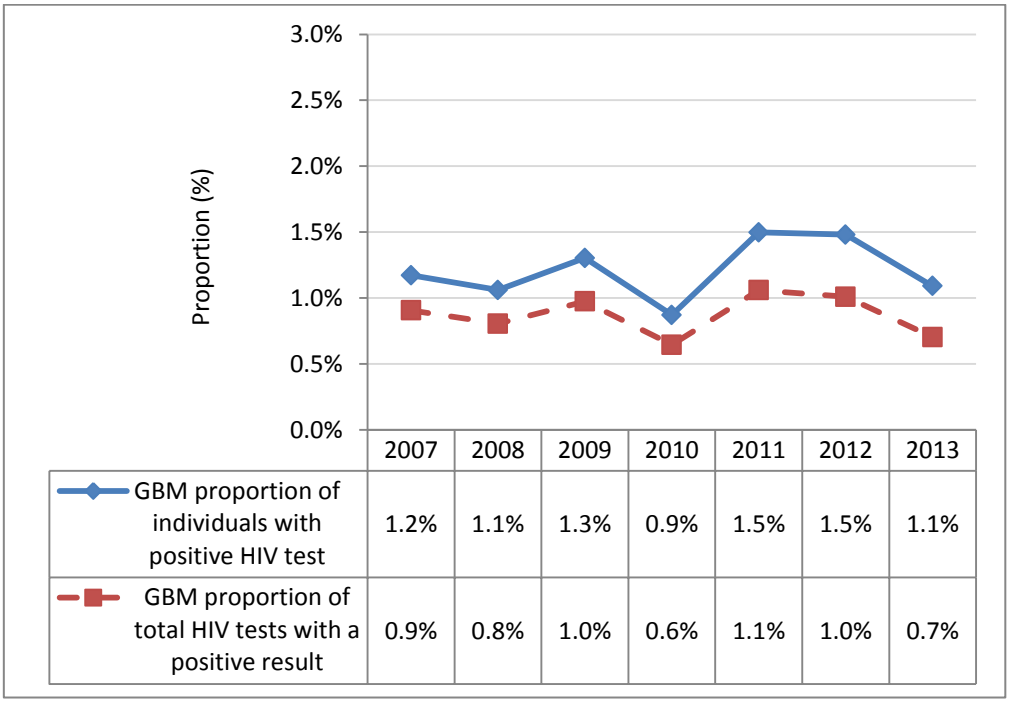


	2007	2008	2009	2010	2011	2012	2013
<20	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
20 - 29	0.3%	0.3%	0.4%	0.2%	0.4%	0.6%	0.5%
30 - 39	0.5%	0.5%	0.7%	0.5%	1.1%	1.1%	0.8%
40 - 49	0.7%	0.6%	0.6%	0.5%	1.0%	0.9%	1.0%
≥50	0.3%	0.7%	0.2%	0.5%	1.1%	0.8%	0.6%

* 'Unique' patients were only identified within each service

The proportion of individual GBM who tested positive for HIV was 1.0% or above in nearly all years except 2013 (0.9%), while the total proportion of HIV tests that were positive was 1.2% or lower in all years.

Figure 26: Proportion of total HIV tests with positive results in GBM and proportion **of unique GBM patients*** tested for HIV with a positive result at sexual health clinics in NSW, by year, 2007-2013

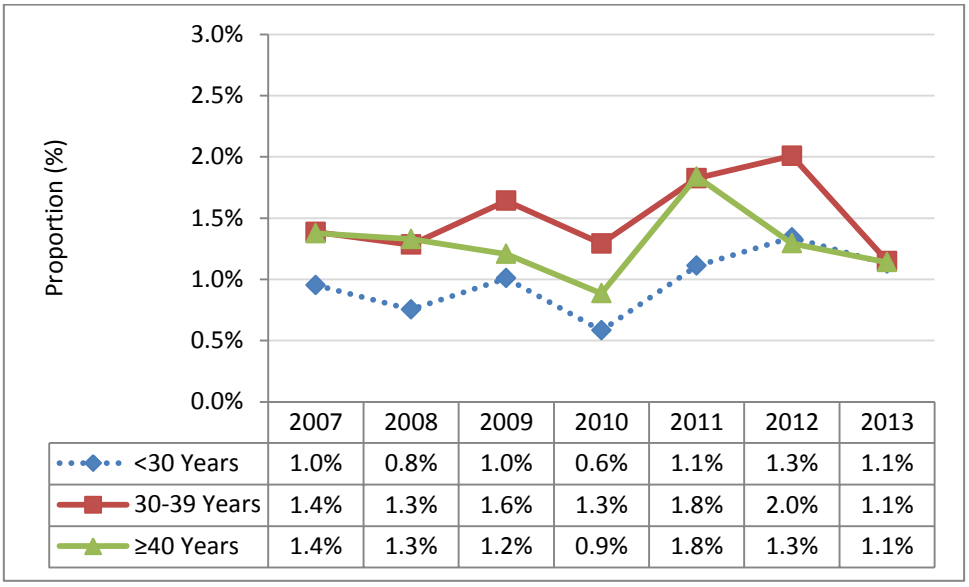


	2007	2008	2009	2010	2011	2012	2013
GBM proportion of individuals with positive HIV test	1.2%	1.1%	1.3%	0.9%	1.5%	1.5%	1.1%
GBM proportion of total HIV tests with a positive result	0.9%	0.8%	1.0%	0.6%	1.1%	1.0%	0.7%

* 'Unique' patients were only identified within each service

Figure 27 shows the proportion of unique GBM who tested positive for HIV, which was generally stable among patients under 30 years old, but decreased slightly among patients 30 – 39 years and those 40 years and older (21% relative decrease each).

Figure 27: Proportion of **unique GBM patients*** tested for HIV with a positive HIV test result at sexual health clinics in NSW, by age group and year, 2007-2013

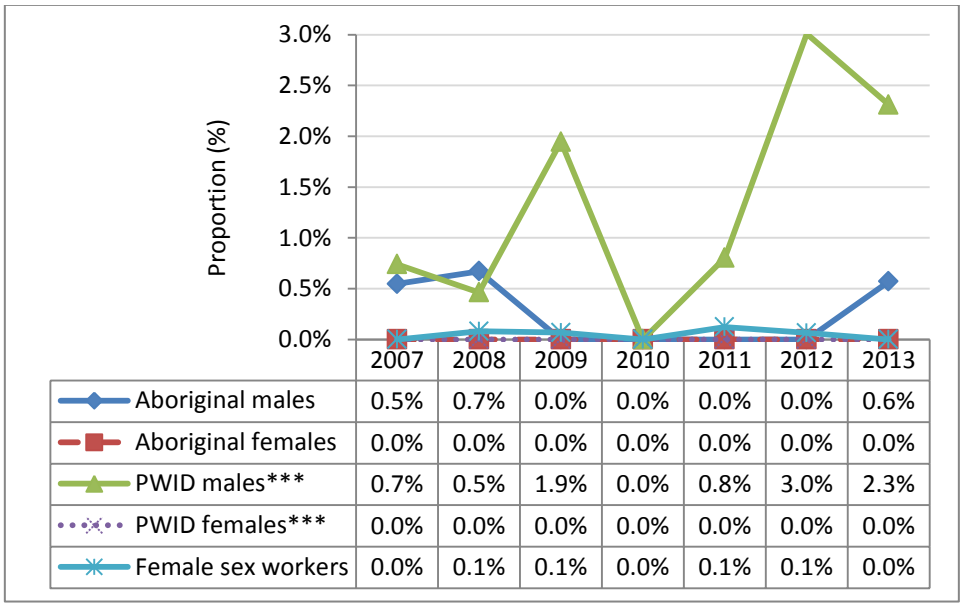


	2007	2008	2009	2010	2011	2012	2013
<30 Years	1.0%	0.8%	1.0%	0.6%	1.1%	1.3%	1.1%
30-39 Years	1.4%	1.3%	1.6%	1.3%	1.8%	2.0%	1.1%
≥40 Years	1.4%	1.3%	1.2%	0.9%	1.8%	1.3%	1.1%

* 'Unique' patients were only identified within each service

There were no HIV positive tests in 2013 for Aboriginal females, female PWIDs or FSWs. However, 0.5% of Aboriginal males (n=2) and 1.8% of male PWIDs (n=7) tested positive in 2013.

Figure 28: Proportion of **unique patients*** tested for HIV with a positive HIV test result at sexual health clinics in NSW, by priority population** other than GBM and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
Aboriginal males	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%	0.6%
Aboriginal females	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PWID males***	0.7%	0.5%	1.9%	0.0%	0.8%	3.0%	2.3%
PWID females***	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Female sex workers	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%

* 'Unique' patients were only identified within each service

** Priority classifications are not mutually exclusive. See *Definitions* for classification details

***PWID=people who inject drugs; positive HIV test results are represented by small numbers for male PWID

HIV INCIDENCE AMONG GBM

HIV incidence among GBM at SHCs was calculated for 2007 – 2013. Given the relatively short follow-up time for 2013, adjustments were made so re-testing in 2013 reflected the median follow-up times in previous years. In 2009, there was a jump in incidence among GBM, which then levelled out until 2013 when a slight increase was observed. In 2013, incidence was highest among GBM aged 30 – 39 years (Figure 30).

These calculations also allowed for an estimation of the time between infection and diagnois. Table 3 overviews the estimated median time from infection to diagnosis. As a median value, it is very likely that some men were infected earlier and later than this estimation.

Figure 29: HIV **incidence** and **median time to infection among GBM** at sexual health clinics in NSW, overall by year, 2007-2013

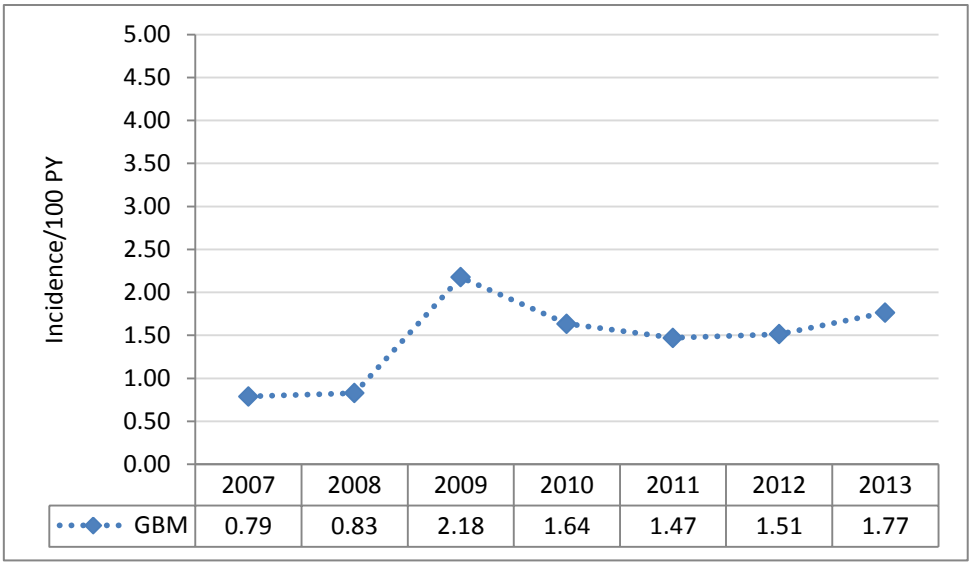
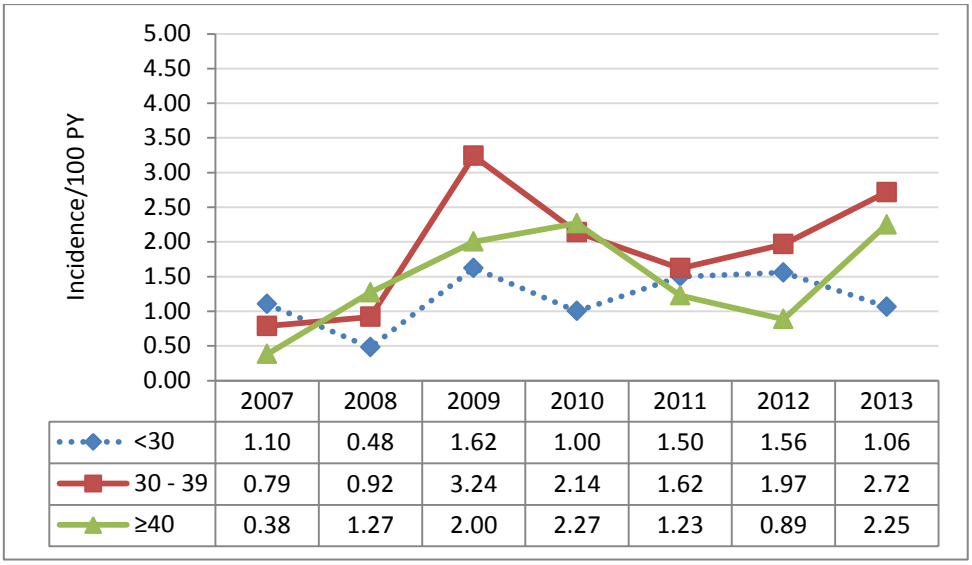


Table 3: Estimated median time from HIV infection to diagnosis among GBM at sexual health clinics in NSW, by year, 2007-2012*

	2007	2008	2009	2010	2011	2012
Median time (days)	140	135	113	186	177	195

*Data from 2013 have been excluded given insufficient time

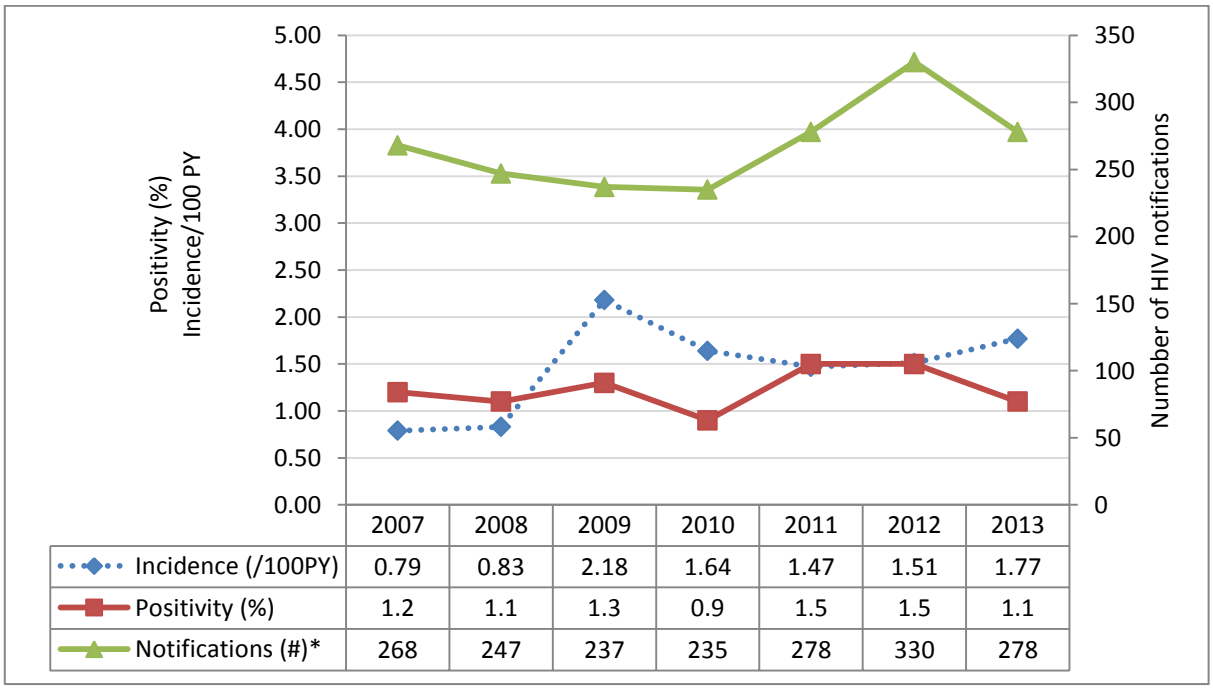
Figure 30: HIV **incidence among GBM** at sexual health clinics in NSW, by age group and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
<30	1.10	0.48	1.62	1.00	1.50	1.56	1.06
30 - 39	0.79	0.92	3.24	2.14	1.62	1.97	2.72
≥40	0.38	1.27	2.00	2.27	1.23	0.89	2.25

The following graph compares HIV incidence, unique positivity and notifications among GBM in NSW. Notifications and positivity showed similar trends. Incidence also appears to have followed a similar trend to notifications, but with a 2 or 3 year lag (i.e., the peak in HIV incidence in 2009 was followed by a rise in notifications in 2011 and 2012).

Figure 31: HIV positivity, incidence and notifications among GBM patients at sexual health clinics in NSW, overall by year, 2007-2013

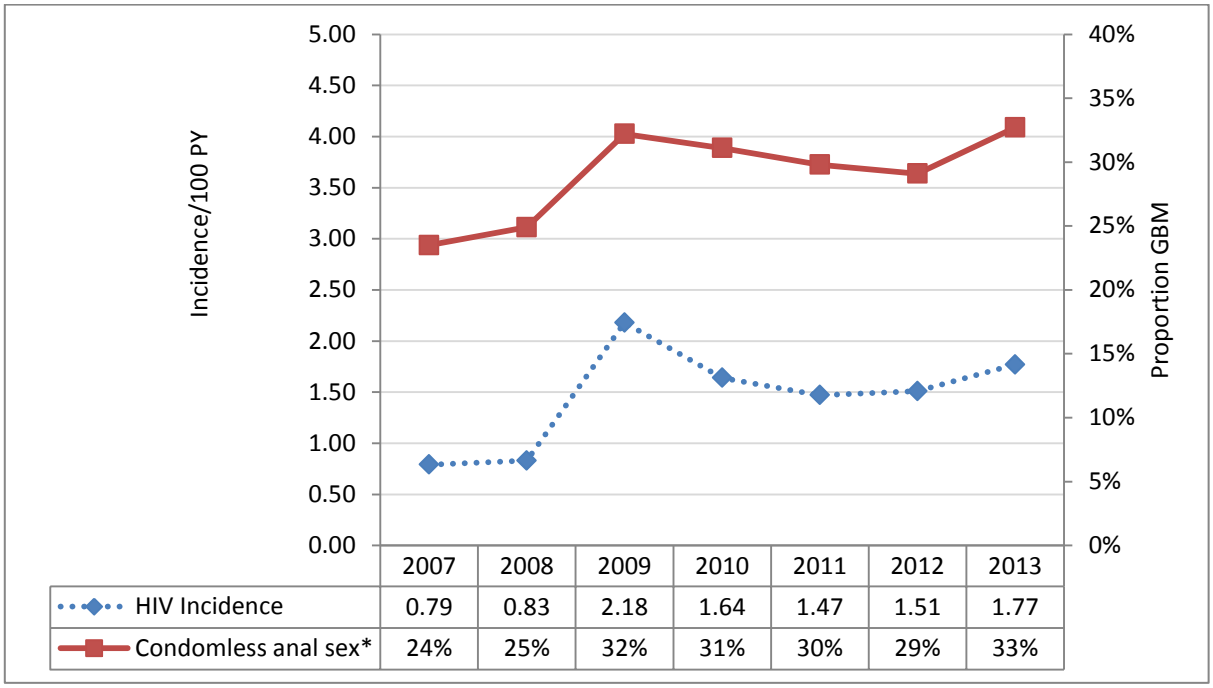


	2007	2008	2009	2010	2011	2012	2013
Incidence (/100PY)	0.79	0.83	2.18	1.64	1.47	1.51	1.77
Positivity (%)	1.2	1.1	1.3	0.9	1.5	1.5	1.1
Notifications (#)*	268	247	237	235	278	330	278

*Source: New South Wales Ministry of Health (MoH). *NSW HIV Strategy 2013 Annual Data Report*. Sydney, NSW: NSW MoH

Figure 32 compares HIV incidence at SHCs in NSW to self-reported survey data on condomless anal sex with casual partners among GBM in Sydney. HIV incidence mimics reports of condomless anal sex with casual partners in the 6 months prior to the survey, highlighting condomless anal sex as a key driver for HIV infection among GBM.

Figure 32: HIV incidence and condomless anal sex* among GBM in NSW, overall by year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
HIV Incidence	0.79	0.83	2.18	1.64	1.47	1.51	1.77
Condomless anal sex*	24%	25%	32%	31%	30%	29%	33%

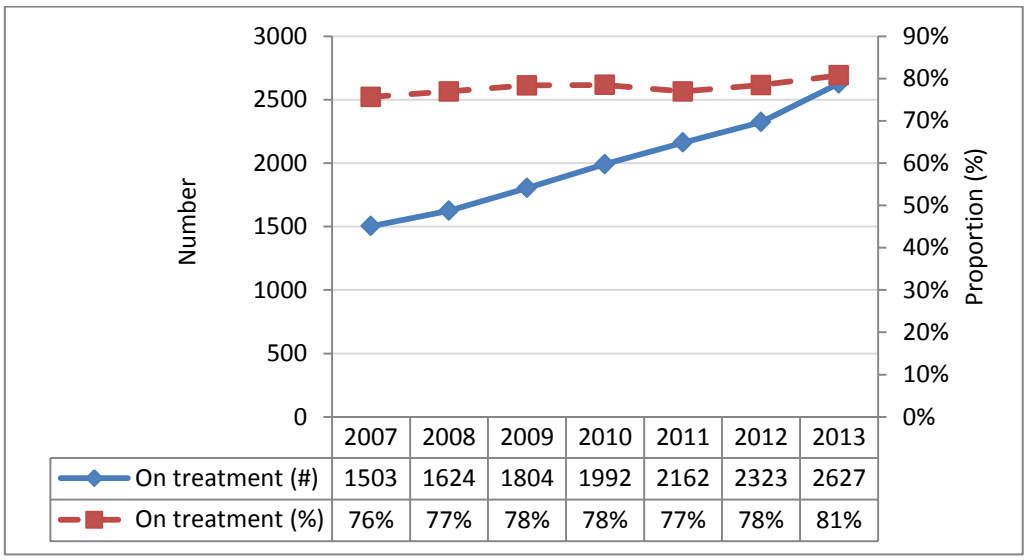
*Source: Centre for Social Research in Health. *Sydney Gay Community Periodic Survey, 2007-2014*. 2014. Sydney, NSW: UNSW Australia

HIV POSITIVE PATIENTS ON TREATMENT

The following graphs present data for patients on treatment for HIV at SHCs in NSW. Treatment for HIV was identified through prescriptions for antiretroviral medication issued from clinics, meaning that some patients recorded as not being on treatment at the individual clinic may have received treatment from another clinic. Treatment indicators are only relevant to patients known to be HIV positive.

Overall, between 2007 and 2013 the number of HIV positive people on treatment increased by 75% but the proportion of attending patients on treatment increased only 5%, a 7% relative icnrease.

Figure 33: Number and proportion of **HIV positive patients on treatment*** at sexual health clinics in NSW, overall by year, 2007-2013

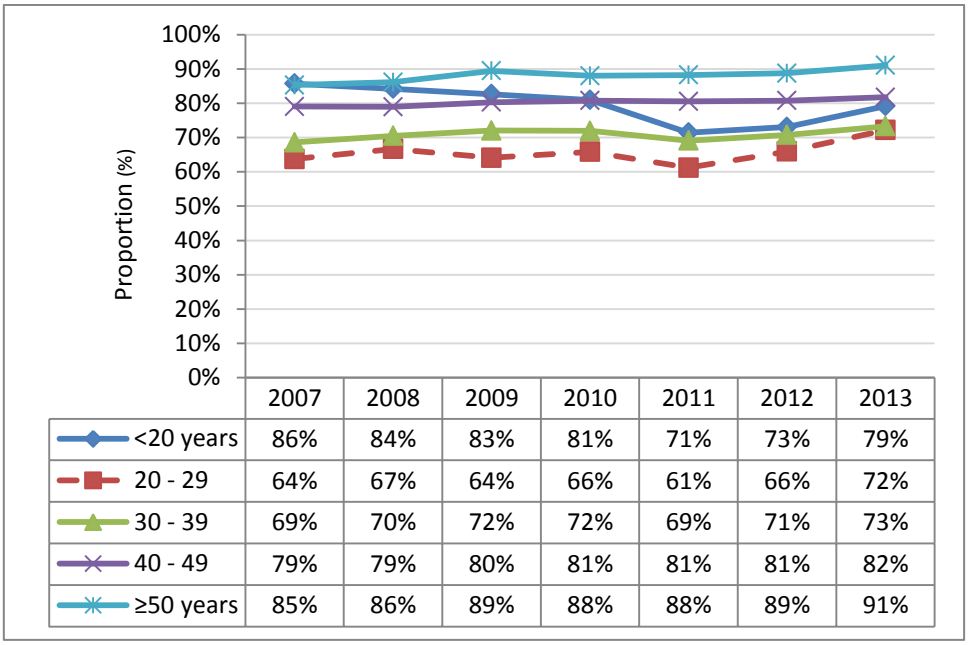


	2007	2008	2009	2010	2011	2012	2013
On treatment (#)	1503	1624	1804	1992	2162	2323	2627
On treatment (%)	76%	77%	78%	78%	77%	78%	81%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

Each year, patients 50 years and older represent the highest proportion of those on treatment for HIV, with a 6% increase between 2007 and 2013 (7% relative increase). The greatest change in the proportion of patients receiving treatment for HIV was among those who are 20 – 29 years old (8% increase; 13% relative increase). Although the proportion of patients under 20 years old decreased between 2007 and 2013, there were only a small number of patients with HIV in this age group each year.

Figure 34: Proportion of **HIV positive patients on treatment*** at sexual health clinics in NSW, by age group and year, 2007-2013

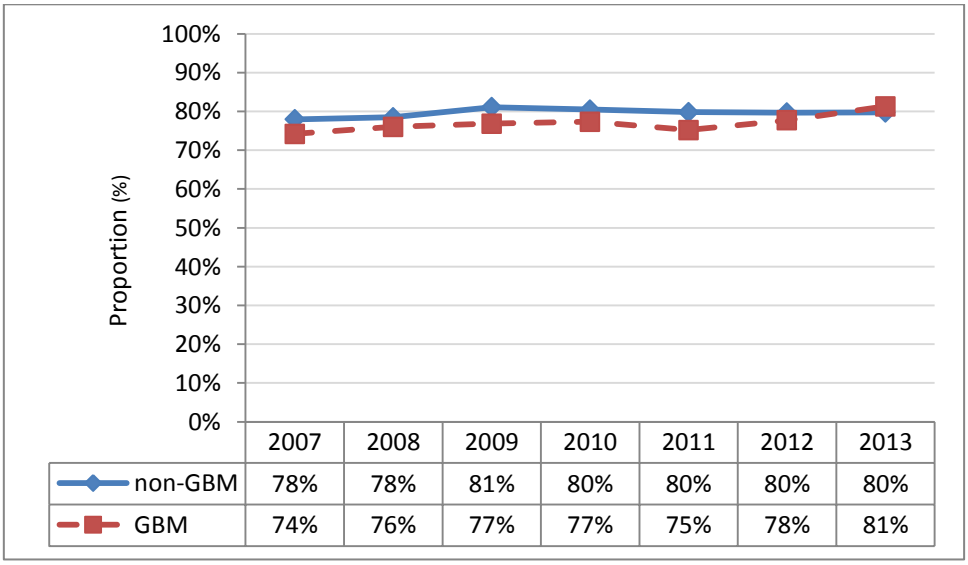


	2007	2008	2009	2010	2011	2012	2013
<20 years	86%	84%	83%	81%	71%	73%	79%
20 - 29	64%	67%	64%	66%	61%	66%	72%
30 - 39	69%	70%	72%	72%	69%	71%	73%
40 - 49	79%	79%	80%	81%	81%	81%	82%
≥50 years	85%	86%	89%	88%	88%	89%	91%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

The proportion of HIV positive GBM who were on treatment at SHCs in NSW rose 7% from 2007 to 2013 (3% relative increase), while the proportion of non-GBM patients rose 7% (9% relative increase).

Figure 35: Proportion of **HIV positive patients on treatment*** at sexual health clinics in NSW, by GBM status and year, 2007-2013

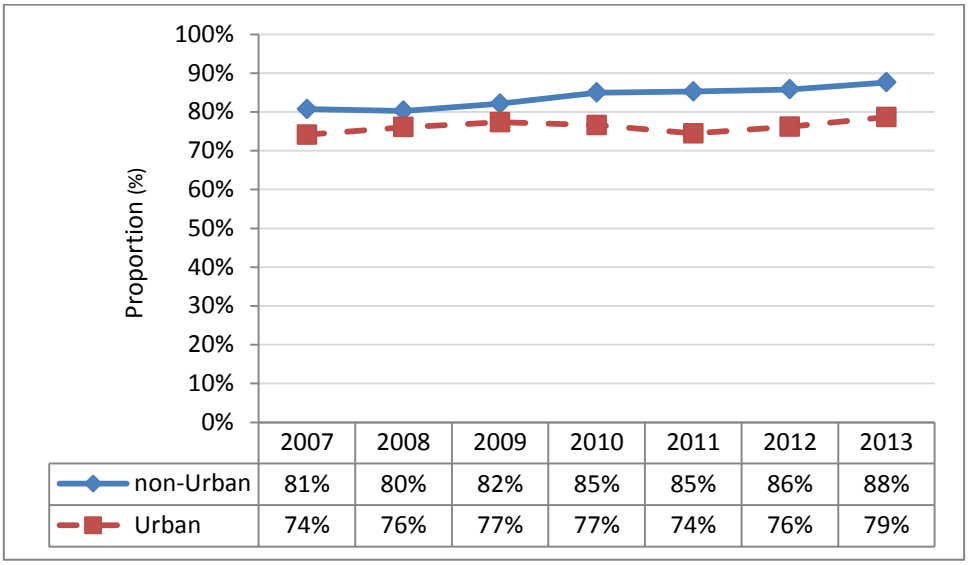


	2007	2008	2009	2010	2011	2012	2013
non-GBM	78%	78%	81%	80%	80%	80%	80%
GBM	74%	76%	77%	77%	75%	78%	81%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

A higher proportion of patients from non-urban areas were recorded as being on treatment, although the proportional change over time between urban and non-urban areas was similar (relative increases of 7% and 9%, respectively). This finding may reflect greater shared care and care options in urban settings.

Figure 36: Proportion of **HIV positive patients on treatment*** at sexual health clinics in NSW, by area of residence** and year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
non-Urban	81%	80%	82%	85%	85%	86%	88%
Urban	74%	76%	77%	77%	74%	76%	79%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded
**Area of residence was determined by patient postcode information and urban/remote classifications developed by the *Australian Bureau of Statistics*[11]

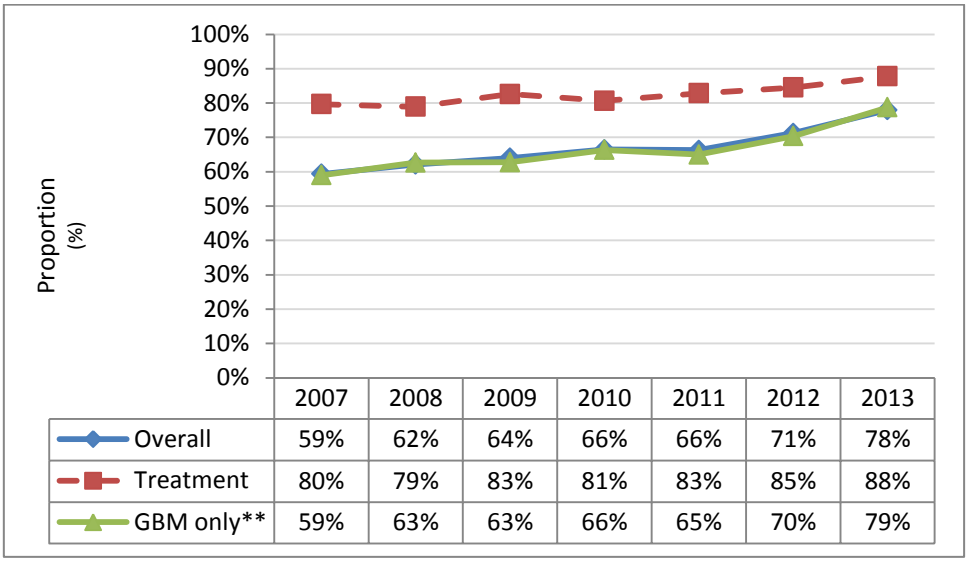
[11] Source: Australian Bureau of Statistics. *Australian Statistical Geography Standard (ASGS): Volume 4 - Significant Urban Areas, Urban Centres and Localities, Section of State*. 2011. Canberra, ACT: Australian Bureau of Statistics.

HIV TREATMENT AND VIRAL LOAD

The following section details viral load test results among patients with HIV and compares patients who received HIV treatment from the SHC with those who did not. As patients may have received more than one viral load test per year, the last test in each 12-month period is included in these graphs. Some patients may have received HIV treatments from other services, for which these data do not account. Because viral load data were not fully available from all ACCESS sites, data for this section were taken from a sub-sample comprised of 12 ACCESS services.

The proportion of all HIV positive patients, GBM HIV positive patients and all HIV positive patients on treatment with an undetectable viral load (<50 RNA copies/mm^3 of blood) increased between 2007 and 2013, reaching 78% for all patients and 88% of patients receiving treatment from a SHC (Figure 37). Among patients with HIV, the proportion with viral loads of >10,000 copies/mm^3 of blood decreased 8% between 2007 and 2013 (38% relative decrease; Figure 38).

Figure 37: Proportion of **HIV positive patients with undetectable viral loads (<50 RNA copies/mm^3 of blood)** seen at sexual health clinics in NSW, overall, among GBM, and by treatment status* and year, 2007-2013

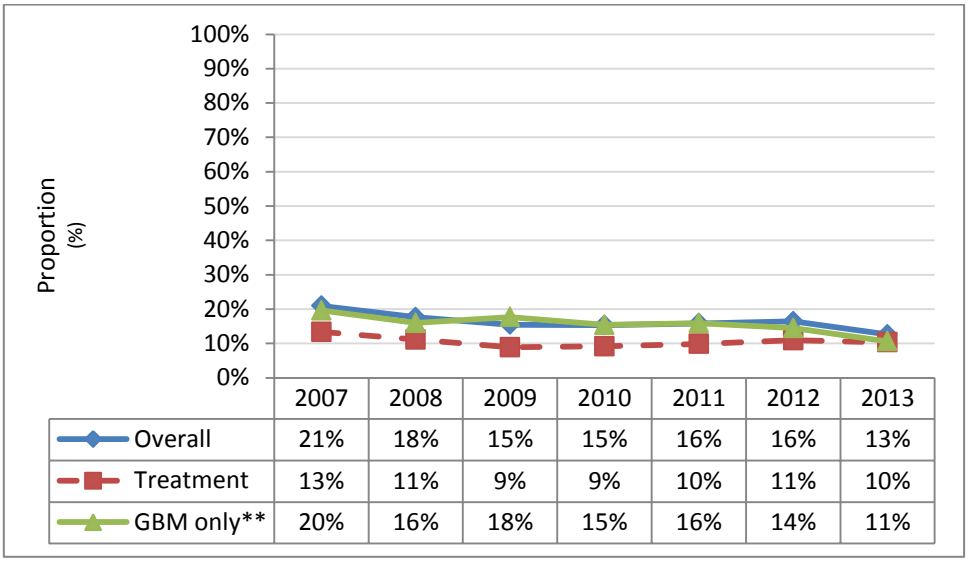


	2007	2008	2009	2010	2011	2012	2013
Overall	59%	62%	64%	66%	66%	71%	78%
Treatment	80%	79%	83%	81%	83%	85%	88%
GBM only**	59%	63%	63%	66%	65%	70%	79%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

**Includes all GBM patients with HIV, irrespective of treatment status

Figure 38: Proportion of **HIV positive patients with viral loads of ≥10,000 RNA copies/mm^3 of blood** seen at a sub-sample of sexual health clinics in NSW, overall and by treatment status* and year, 2007-2013



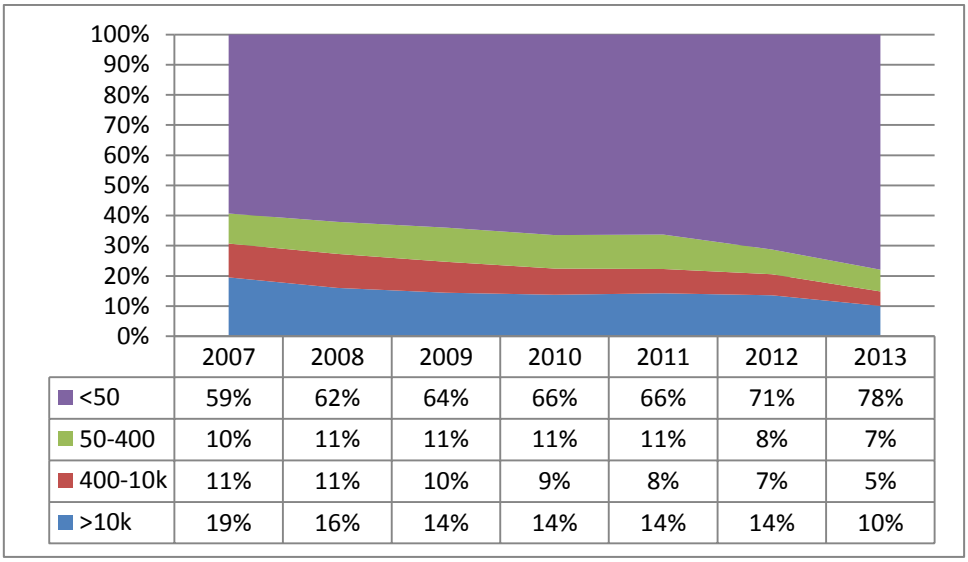
	2007	2008	2009	2010	2011	2012	2013
Overall	21%	18%	15%	15%	16%	16%	13%
Treatment	13%	11%	9%	9%	10%	11%	10%
GBM only**	20%	16%	18%	15%	16%	14%	11%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

**Includes all GBM patients with HIV, irrespective of treatment status

The following graph reports on each HIV positive patient's last viral load test result in a year. The proportion of patients with less than 50 RNA copies/mm^3 increased 19% between 2007 and 2013 (32% relative increase) while patients with viral loads of greater than 10,000 RNA copies/mm^3 fell 9% (47% relative decrease).

Figure 39: Proportion of **HIV positive patients with viral loads* of <50, 50-<400, 400-10,000 and > 10,000** seen at a sub-sample of sexual health clinics in NSW, by year, 2007-2013



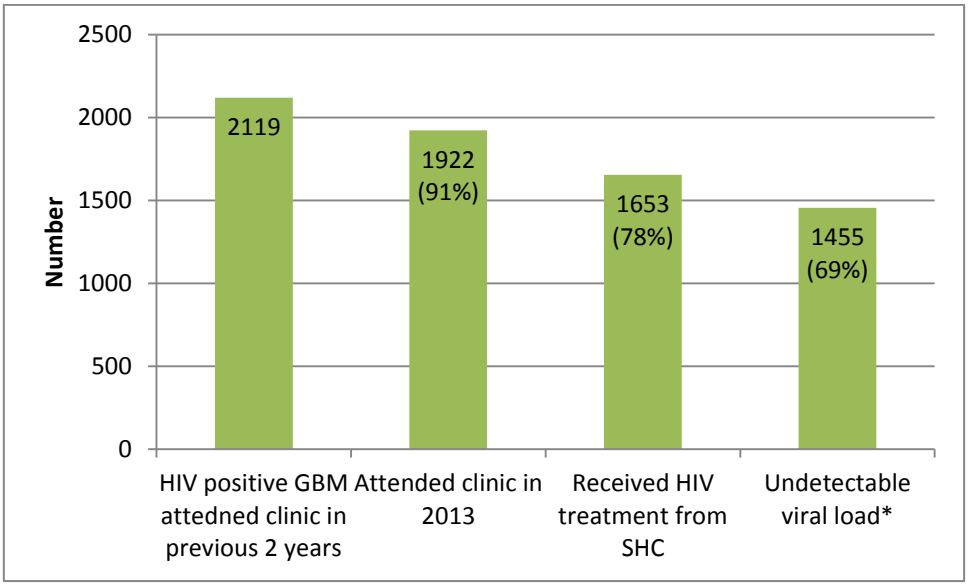
	2007	2008	2009	2010	2011	2012	2013
<50	59%	62%	64%	66%	66%	71%	78%
50-400	10%	11%	11%	11%	11%	8%	7%
400-10k	11%	11%	10%	9%	8%	7%	5%
>10k	19%	16%	14%	14%	14%	14%	10%

*Viral load values are presented as the number of RNA copies/mm^3 of blood

The following graphs details the HIV 'care cascade' for HIV positive GBM patients attending sexual health services in NSW in 2013. This graph offers a visual representation of the proportion of GBM patients with HIV who attended a service, were receiving treatment for HIV, and had a viral load test result of <50 RNA copies/mm^3 of blood (undetectable).

In the 2 years prior to 2013, there were 2,119 HIV positive GBM who attended a SHC at least once. Of those men, 91% had 1 or more consultations in 2013, 78% received treatment from the clinic, and 69% overall had an undetectable viral load at their last test of the year.

Figure 40: HIV **'care cascade' for HIV positive patients** attending sexual health clinics in NSW in 2013



*The number of GBM with undetectable viral load results was estimated using the proportions calculated from a sub-sample of SHCs, as detailed in Figure 37.

HIV TREATMENT AND CD4 COUNT

The following graphs compare the annual CD4 cell counts of patients with HIV on the basis of treatment for HIV. As patients may have had multiple CD4 cell count tests per year, the last test conducted in each 12-month period is presented here. Some patients may have received HIV treatments from other services, for which these data do not account. Because CD4 cell count data were not fully available for all ACCESS sites, data for this section were taken from a sub-sample comprised of 12 ACCESS services.

Overall, the proportion of patients with CD4 cell counts greater than 500 cells/mm^3 of blood increased 19% from 2007 to 2013 (41% relative increase).

Figure 41: Proportion of **HIV positive patients with an average of >500 CD4 cells/mm^3 of blood** seen at a sub-sample of sexual health clinics in NSW, overall and by treatment status* and year, 2007-2013

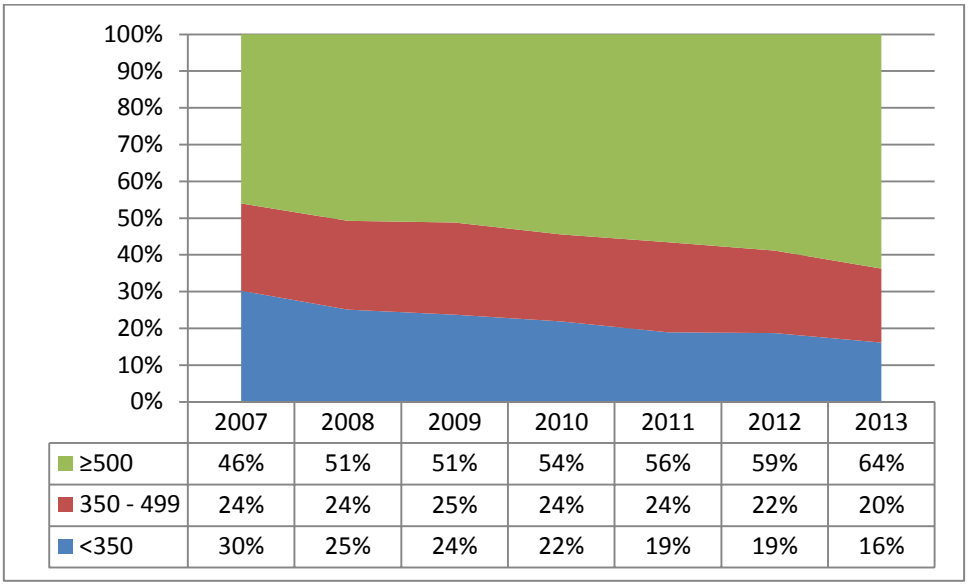
	2007	2008	2009	2010	2011	2012	2013
Overall	46%	53%	51%	55%	57%	60%	65%
Treatment	44%	52%	54%	56%	59%	60%	66%
GBM only**	49%	55%	52%	56%	58%	61%	67%

*Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

**Includes all GBM patients with HIV, irrespective of treatment status

Between 2007 and 2013, the majority of HIV positive patients had CD4 cell counts of greater than 500 cells/mm^3 of blood. The proportion of patients with low CD4 cell counts (<350 cells/mm^3 of blood) declined 14% between 2007 and 2013, a 47% relative decrease.

Figure 42: Proportion of **HIV positive patients with CD4 counts* of <350, 350-499 and >500** at a sub-sample of sexual health clinics in NSW, by year, 2007-2013



	2007	2008	2009	2010	2011	2012	2013
≥500	46%	51%	51%	54%	56%	59%	64%
350 - 499	24%	24%	25%	24%	24%	22%	20%
<350	30%	25%	24%	22%	19%	19%	16%

* CD4 cell counts are presented as the number of cells/mm^3 of blood

High caseload general practice network

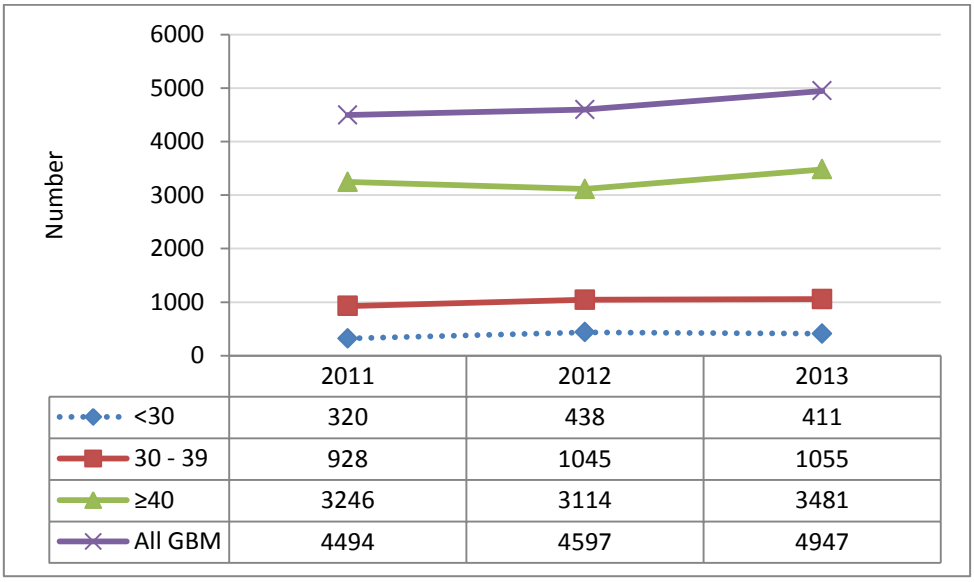
This section of the report is populated using data collected as part of an intervention study known as *The eTEST Project*. Starting in 2011, eTEST routinely collected surveillance data from general practice (GP) clinics that see a high number of GBM patients. These data are only available for GBM patients from 2011 through 2013. Sexual orientation as recorded in the patient records was used to identify GBM patients.

UNIQUE PATIENTS ATTENDING

These graphs represent the number of unique patients attending participating high caseload GP clinics in NSW. Unique patients are defined as the total number of GBM patients who attended the service at least once per 12-month period. Patients that attended multiple services were counted multiple times as unique patients were only identified *within* a clinic.

There was a 10% increase in the number of GBM patients seen at high caseload GP clinics from 2011 to 2013 with the largest increase among GBM under 30 years old (relative increase of 28%). Increases were observed across all age groups.

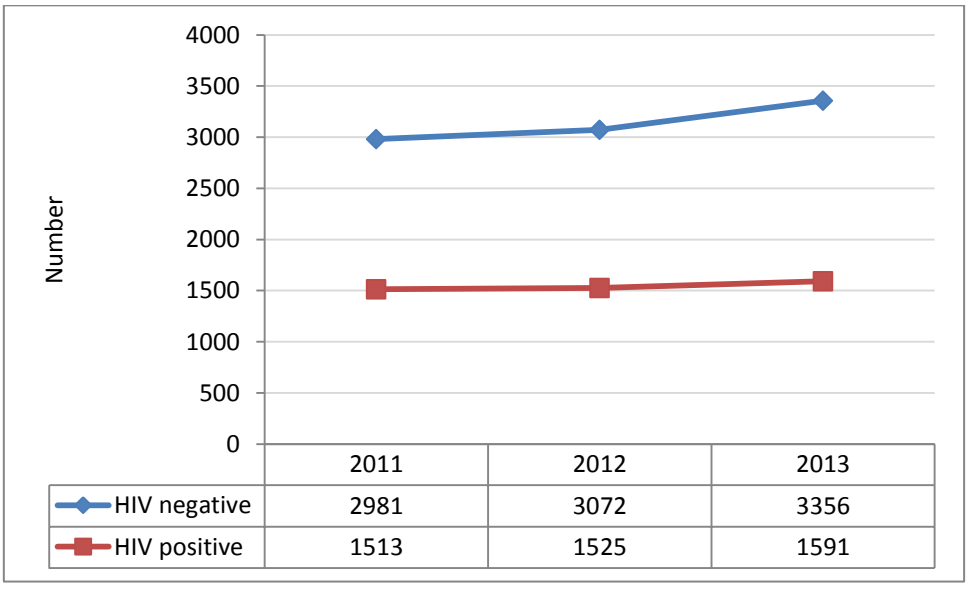
Figure 43: Number of **unique GBM*** seen at high caseload GP clinics in NSW, overall and by age group and year, 2011-2013



	2011	2012	2013
<30	320	438	411
30 - 39	928	1045	1055
≥40	3246	3114	3481
All GBM	4494	4597	4947

* 'Unique' patients were only identified within each service

Figure 44: Number of **unique GBM*** seen at high caseload GP clinics in NSW, by HIV status and year, 2011-2013



	2011	2012	2013
HIV negative	2981	3072	3356
HIV positive	1513	1525	1591

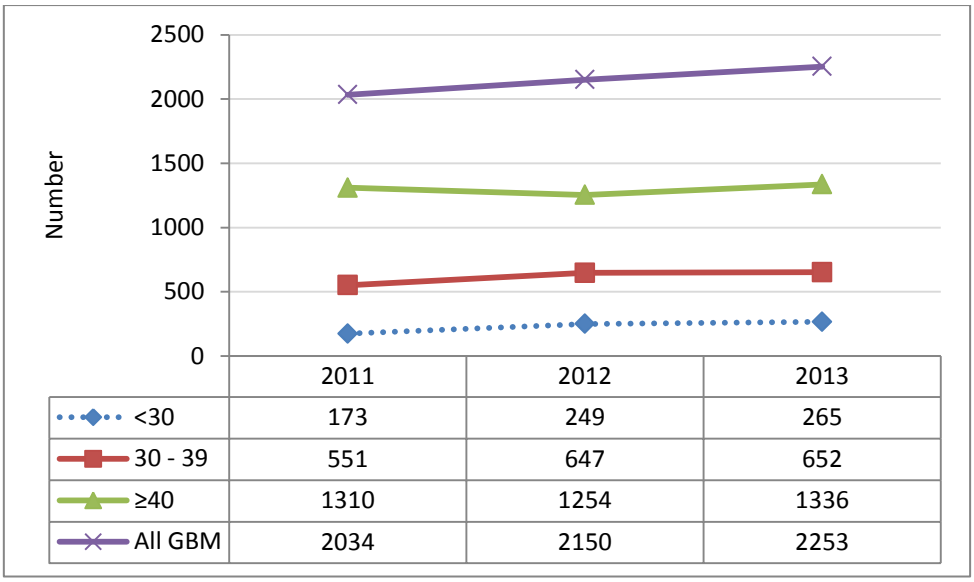
* 'Unique' patients were only identified within each service

TOTAL HIV TESTS

Total tests refers to the absolute number of HIV tests conducted among GBM patients, which means that one patient could have been tested multiple times in each 12-month period.

From 2011 to 2013, the total number of HIV tests conducted at high caseload GP clinics in NSW increased by 11%, with the greatest increase among GBM less than 30 years old (53% increase).

Figure 45: Total **number of HIV tests** in GBM patients seen at high caseload GP clinics in NSW, overall and by age group and year, 2011-2013

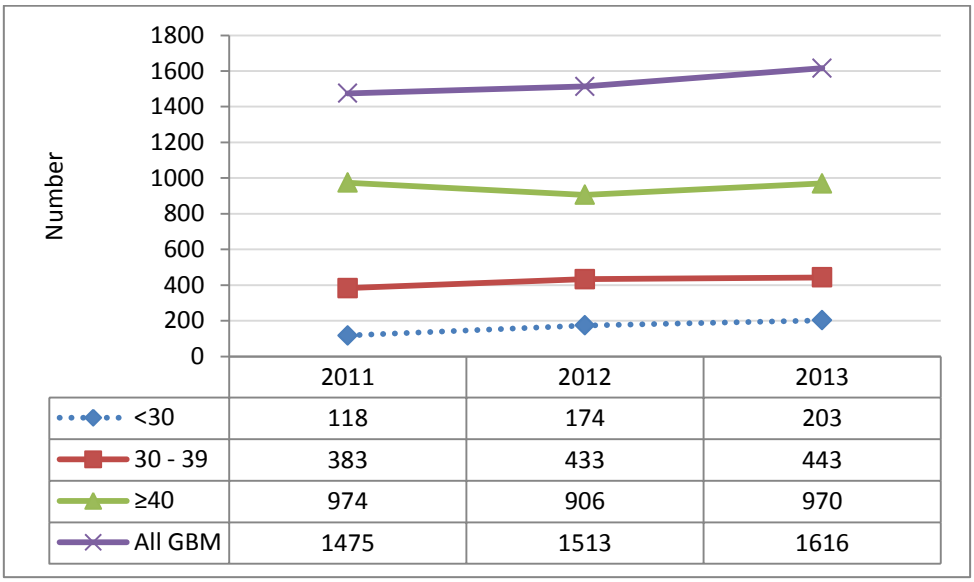


	2011	2012	2013
<30	173	249	265
30 - 39	551	647	652
≥40	1310	1254	1336
All GBM	2034	2150	2253

UNIQUE PATIENTS TESTED FOR HIV

This indicator accounts for repeat testing among patients by considering the number of patients tested per 12-month period instead of the total number of tests. Since 2011, the number of individual GBM tested at least once for HIV at high caseload GP clinics increased by 10%. While there was a 72% increase between 2011 and 2013 among GBM under 30 years, the number of men 40 years and older who were tested remained stable.

Figure 46: Number of **unique GBM** tested for HIV at high caseload GP clinics in NSW, overall and by age group and year, 2011-2013



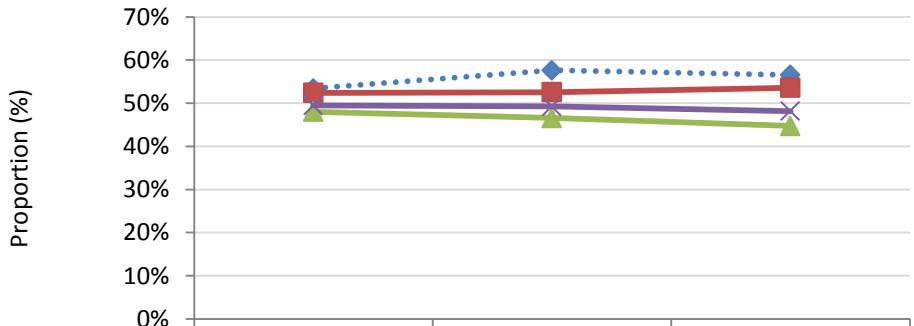
	2011	2012	2013
<30	118	174	203
30 - 39	383	433	443
≥40	974	906	970
All GBM	1475	1513	1616

PROPORTION TESTED FOR HIV (UPTAKE)

The following graphs detail the proportion of attending HIV negative GBM patients who received one or more tests for HIV in a 12-month period. This proportion remained stable in NSW high caseload GP clinics.

Figure 47 shows that the proportion of unique HIV negative GBM patients tested for HIV at high caseload GP clinics remained generally stable between 2011 and 2013, rising slightly (4% increase; an 8% relative increase) among GBM under 30 years old.

Figure 47: Proportion of GBM patients* tested for HIV test at high caseload GP clinics in NSW, overall and by age group and year, 2007-2013



	2011	2012	2013
<30	53%	58%	57%
30 - 39	52%	53%	54%
≥40	48%	47%	45%
All GBM	49%	49%	48%

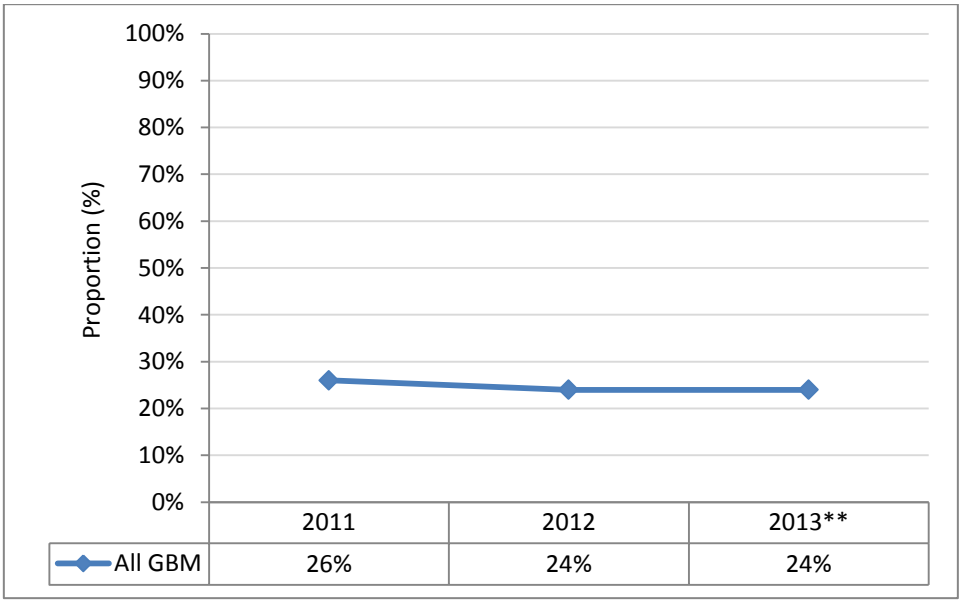
* Excluding (diagnosed) HIV positive individuals

RE-TESTING FOR HIV AMONG GBM

Sexual health testing guidelines recommend annual testing for HIV among sexually-active GBM. This graph reports on the proportion of GBM tested at high caseload GPs for whom an HIV test was followed by one or more subsequent HIV tests within a 13-month period. Where a test was conducted within 6 weeks of a previous HIV test, only the first test was counted. Also, patients whose initial test for HIV was positive were excluded. Data from 2013 are presented but given the 13-month timeframe it is possible that this proportion underestimates the number of men who achieved this testing target. These data only represent the proportion of GBM who were re-tested at the same clinic.

Between 2011 and 2013 the proportion of GBM who had a second HIV test within 13 months of a negative initial HIV test at high caseload GP clinics remained largely unchanged.

Figure 48: Proportion of GBM re-tested within 13 months of an initial HIV test at high caseload general practice clinics in NSW, by year*, 2011-2013



*The year reflects the date of the initial test
**For 2013: given the 13-month timeframe, it is possible that the proportion is an underestimate

General practice clinic network

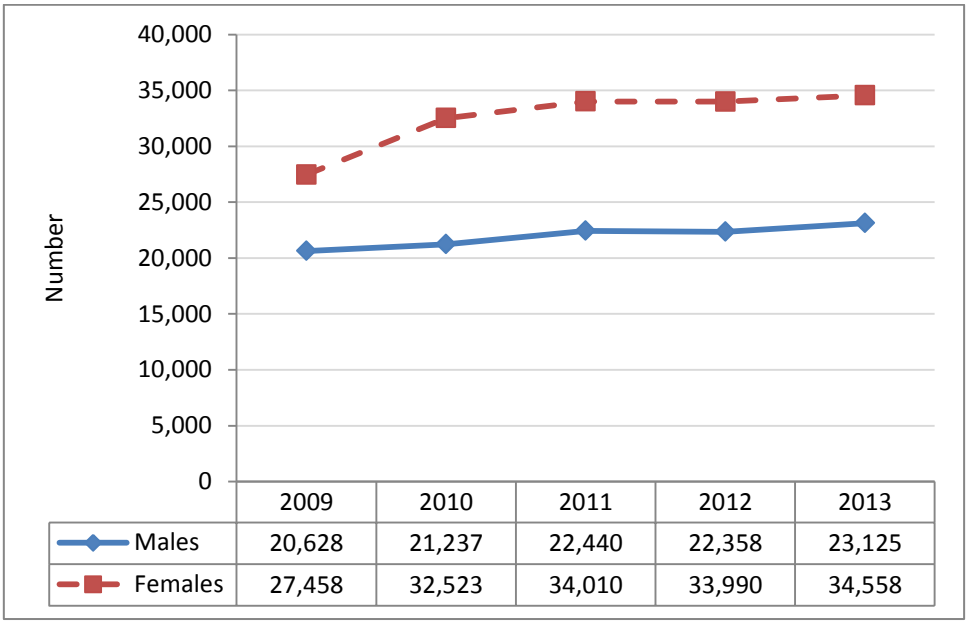
The General Practice Clinic Network includes GP clinics that do not see a high caseload of GBM. Data for these clinics are available since 2009.

UNIQUE PATIENTS ATTENDING

These graphs represent the number of unique patients attending participating general practice clinics in NSW. Unique patients are defined as the total number of patients who attended the service at least once per 12-month period. Patients that attended multiple services were counted multiple times as unique patients were only identified *within* a clinic.

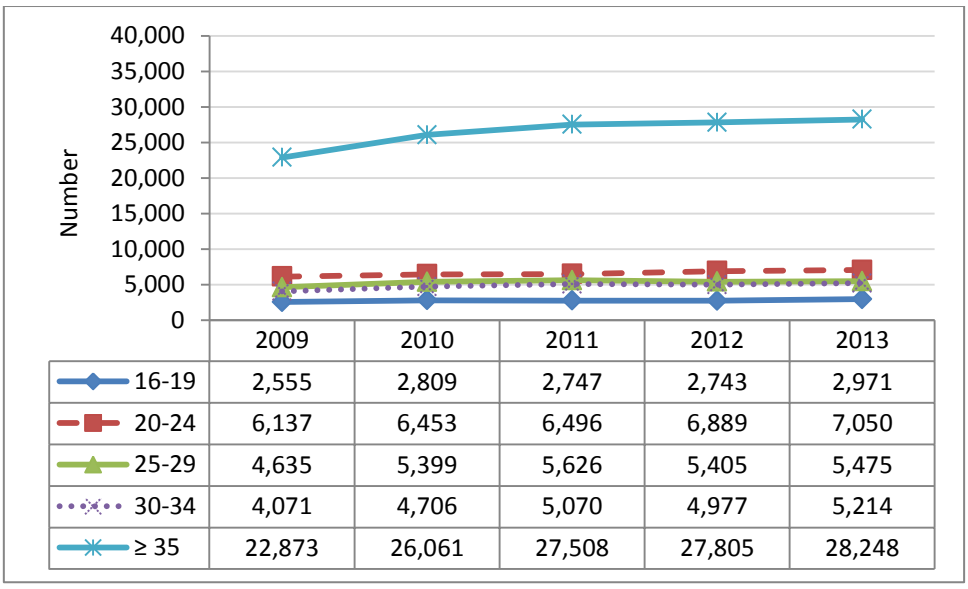
Between 2009 and 2013, the number of unique patients seen at general practice clinics increased 20%. A higher number of females compared to males were seen at general practice clinics (Figure 49), and the greatest increase in attendance between 2009 and 2013 was among patients aged 30 – 34 years (28% increase; Figure 50).

Figure 49: Number of **unique patients** seen at general practice clinics in NSW, by sex and year, 2007-2013



	2009	2010	2011	2012	2013
Males	20,628	21,237	22,440	22,358	23,125
Females	27,458	32,523	34,010	33,990	34,558

Figure 50: Number of **unique patients** seen at general practice clinics in NSW, by age group and year, 2009-2013



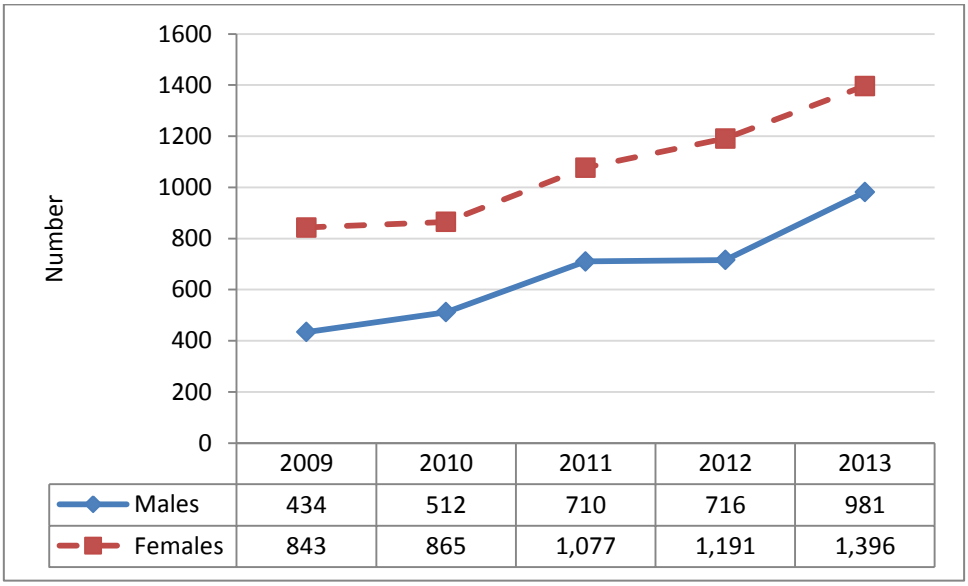
	2009	2010	2011	2012	2013
16-19	2,555	2,809	2,747	2,743	2,971
20-24	6,137	6,453	6,496	6,889	7,050
25-29	4,635	5,399	5,626	5,405	5,475
30-34	4,071	4,706	5,070	4,977	5,214
≥ 35	22,873	26,061	27,508	27,805	28,248

TOTAL HIV TESTS

The HIV test totals below reflect the absolute number of HIV tests conducted per year, which might include multiple tests for the same patient.

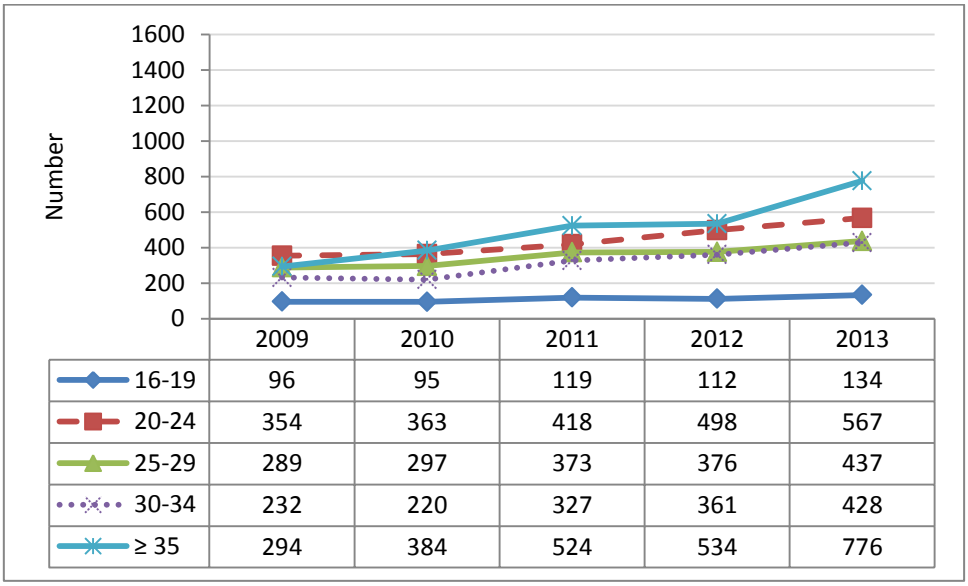
The total number of HIV tests among females increased by 26% from 2009 to 2013, while the number of HIV tests among males increased by 12% (Figure 51). By age, the greatest increase between 2009 and 2013 was among patients 35 year and older (164%; Figure 52).

Figure 51: Total **number of HIV tests** in patients seen at general practice clinics s in NSW, by sex and year, 2009-2013



	2009	2010	2011	2012	2013
Males	434	512	710	716	981
Females	843	865	1,077	1,191	1,396

Figure 52: Total **number of HIV tests** in patients seen at general practice clinics in NSW, by age group and year, 2009-2013



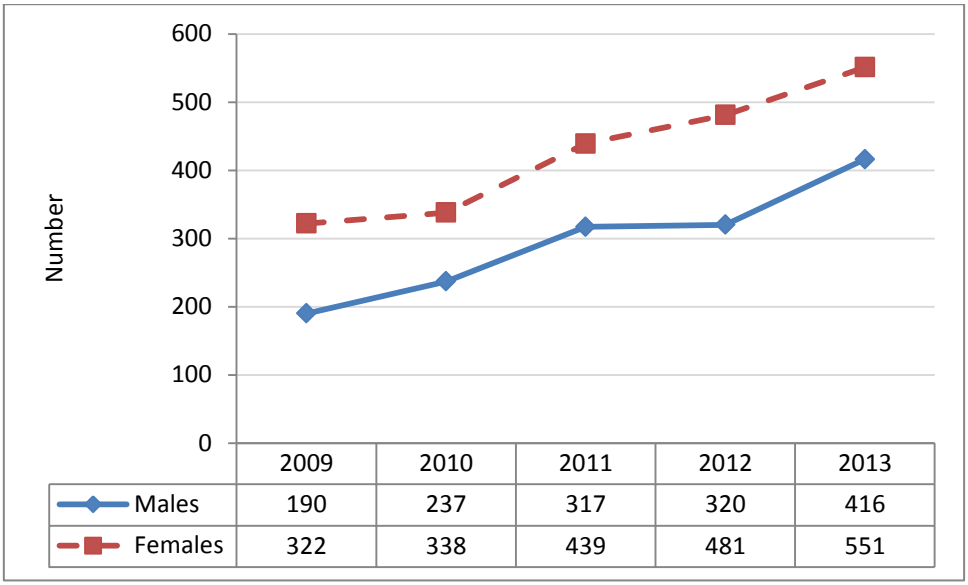
	2009	2010	2011	2012	2013
16-19	96	95	119	112	134
20-24	354	363	418	498	567
25-29	289	297	373	376	437
30-34	232	220	327	361	428
≥ 35	294	384	524	534	776

UNIQUE PATIENTS TESTED FOR HIV (UPTAKE)

The following graphs report on the number of unique (i.e., individual) patients tested for HIV annually.

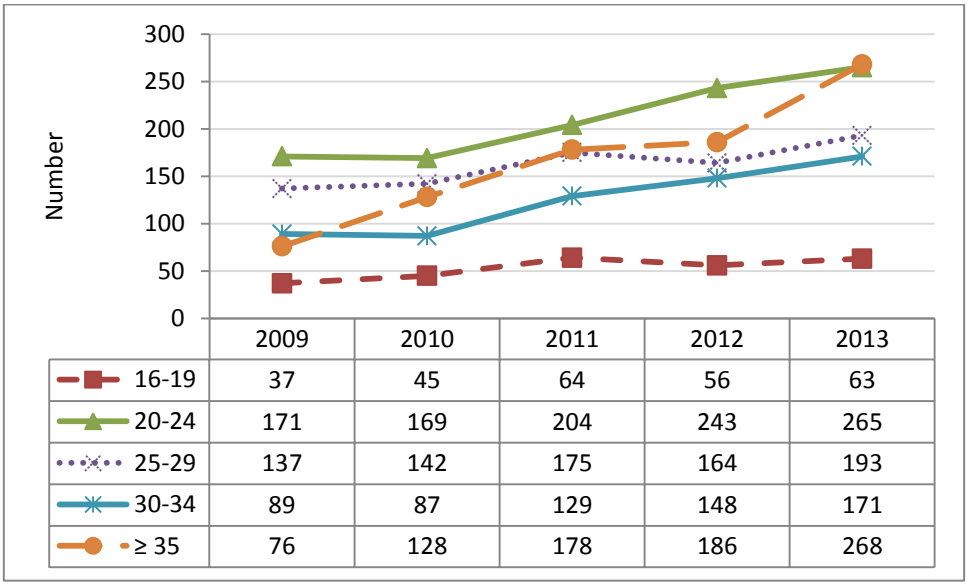
Between 2009 and 2013 there was a 119% increase in the number of individual male patients tested for HIV, while among female patients there was a 71% increase (Figure 53). The greatest increase in patients tested was among those aged 35 years and older (253% increase between 2009 and 2013; Figure 54).

Figure 53: Number of **unique patients tested** for HIV at general practice clinics in NSW, by sex and year, 2009-2013



	2009	2010	2011	2012	2013
Males	190	237	317	320	416
Females	322	338	439	481	551

Figure 54: Number of **unique patients tested** for HIV at general practice clinics in NSW, by age group and year, 2009-2013



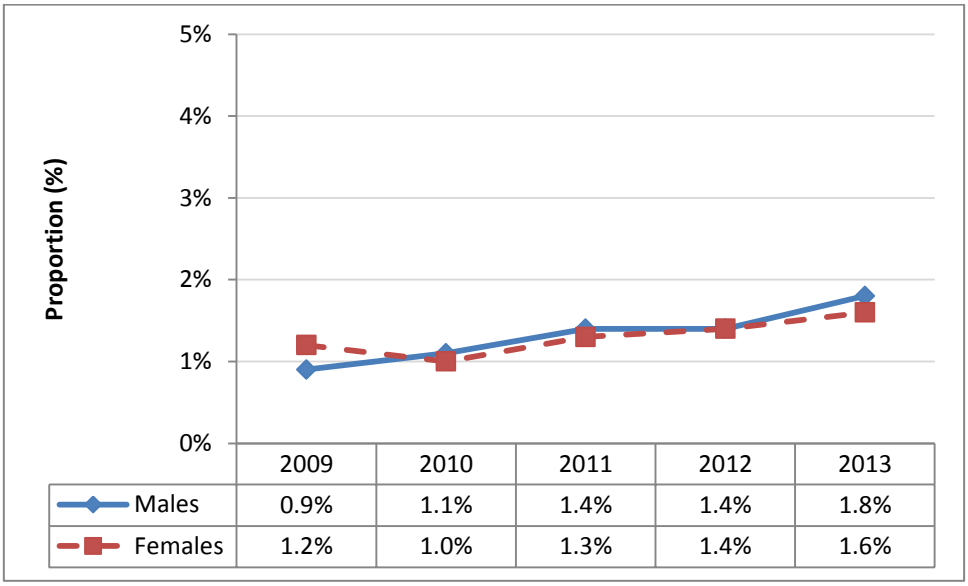
	2009	2010	2011	2012	2013
16-19	37	45	64	56	63
20-24	171	169	204	243	265
25-29	137	142	175	164	193
30-34	89	87	129	148	171
≥ 35	76	128	178	186	268

PROPORTION TESTED FOR HIV

This section details the proportion of unique patients who attended the clinic at least once in a 12-month period, and received 1 or more tests for HIV (HIV test uptake).

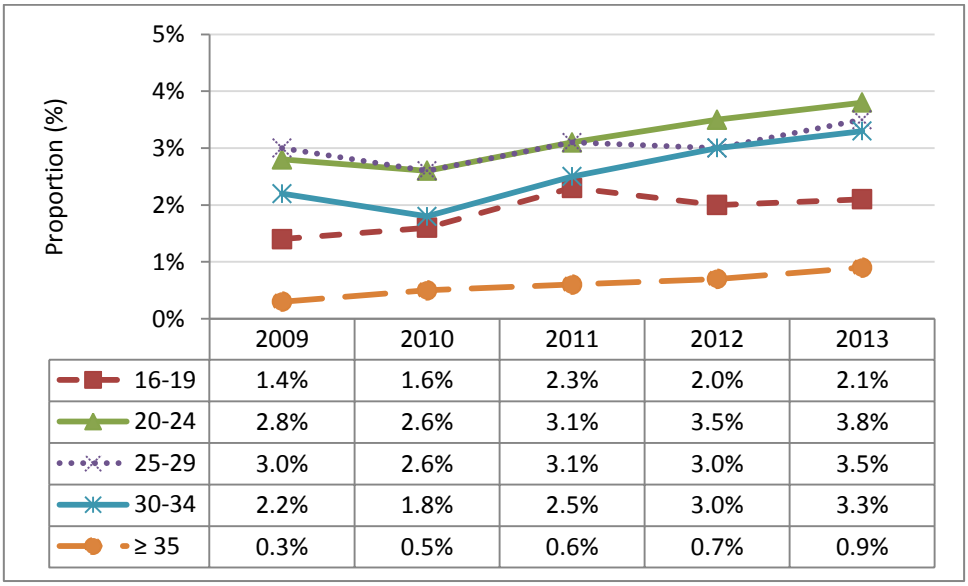
In 2013, a similar proportion of male (1.8%) and female (1.6%) clinic attendees were tested for HIV. From 2009 to 2013 the proportion of unique patients tested for HIV increased 0.9% among men and 33% among women (100% and 33% relative increases respectively; Figure 55). The greatest change between 2009 and 2013 was among patients aged 35 years and older (relative increase of 200%; Figure 56).

Figure 55: Proportion of **patients with an HIV test** at general practice clinics in NSW, by age group and year, 2009-2013



	2009	2010	2011	2012	2013
Males	0.9%	1.1%	1.4%	1.4%	1.8%
Females	1.2%	1.0%	1.3%	1.4%	1.6%

Figure 56: Proportion of **patients with an HIV test** at general practice clinics in NSW, by age group and year, 2009-2013



	2009	2010	2011	2012	2013
16-19	1.4%	1.6%	2.3%	2.0%	2.1%
20-24	2.8%	2.6%	3.1%	3.5%	3.8%
25-29	3.0%	2.6%	3.1%	3.0%	3.5%
30-34	2.2%	1.8%	2.5%	3.0%	3.3%
≥ 35	0.3%	0.5%	0.6%	0.7%	0.9%

Appendix 1: ACCESS Methods

The Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of STIs and BBVs (ACCESS) is a national sentinel surveillance system originally established in 2007. At inception, the purpose of the ACCESS study (previous name: Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance) was to monitor trends in testing and positivity rates of chlamydia infection. This original model was funded by the Commonwealth Department of Health through the Chlamydia Targeted Grants Program from 2007 to 2010.

In 2013, the ACCESS study was expanded to include: **a)** additional sites, **b)** all sexually transmissible infections (i.e., HIV, gonorrhoea and syphilis), and, **c)** additional behavioural, testing, diagnoses and treatment variables. The expansion was designed and implemented in extensive consultation with the services participating in ACCESS. The expanded model is currently funded by the health departments of **NSW**, **VIC**, **ACT** and **NT**.

The expanded model of the ACCESS study is a collaboration between the Kirby Institute, the Burnet Institute and the National Reference Laboratory and includes three clinical networks (sexual health clinic network, primary health care network, Aboriginal community controlled health services network) and a laboratory network (Figure 1). In addition the primary health care network has a sub-network of general practices which see high-case load of patients with HIV.

Figure 1: ACCESS networks

An overall coordinating committee provides guidance and advice on the direction of the study and comprises of ACCESS investigators, the network steering group chairs and representatives from funding states. In addition, each network has a steering committee, which includes representations from the sentinel sites included in the network and oversees the development, conduct and progress of the network. Each network has its own coordinator to oversee the operation of that network, and ACCESS has two overall coordinators (one at the Kirby Institute and one at the Burnet Institute) who lead and compile the four networks.

Each network has separate ethics and governance approvals from all relevant local human research ethics committees and research governance offices. The ethics approval directs the functioning of each network.

ACCESS collates routinely collected data from the sentinel sites, and works closely with individual sites and the patient management system developers to electronically extract the data from the sites and share with the respective network. All data shared and collated by ACCESS is de-identified and is always shared in a secured manner (protected by passwords or encryption). Once received, data is collated, cleaned and analysed. All data is stored in a password protected server and only the relevant network investigators have

access to the data. The data is reported through a number of different avenues, including annual reports to the funding states and reports to participating sites.

Appendix 2: HIV testing indicator definitions

Indicator	Definition	Numerator	Denominator
Unique patients attending	Number of unique patients seen in a 12-month time period	N/A	N/A
Total HIV tests	Total number of HIV tests	N/A	N/A
Unique patients tested for HIV	Number of unique (i.e., individual) patients tested for HIV	N/A	N/A
Proportion tested for HIV (uptake)	Proportion of unique patients tested for HIV	Number of unique HIV negative patients seen at clinic who had an HIV test	Number of unique HIV negative patients seen at clinic
Annual re-testing	Proportion of patients re-tested for HIV in 13 months following an initial negative test	Number of patients with an initial negative HIV test who were re-tested within 6 weeks and 13 months	Number of patients with an initial negative HIV test
Bi annual re-testing	Proportion of high risk GBM* re-tested for HIV twice in 13 months following an initial negative test	Number of high risk* HIV negative GBM who received two or more follow-up HIV tests within 6 weeks and 13 months	Number of high risk* GBM patients with an initial negative HIV test

*High risk men are those with >5 partners in the 3 months prior, or >20 partners in the 12 months prior, or a chlamydia, gonorrhoea or syphilis diagnosis in the 24 months prior (see Table 1 and *Definitions* for more information)

Appendix 3: HIV positivity and incidence definitions

Indicator	Definition	Numerator	Denominator
HIV positivity *a) Non-unique positivity*	Proportion of HIV tests overall which returned positive* results	Number of positive HIV tests	Number of HIV tests
HIV positivity *b) Unique positivity*	Proportion of unique (i.e., individual) patients with a positive HIV test result	Number of unique patients tested for HIV with a positive result	Number of unique patients tested for HIV
HIV incidence	Incident rate of HIV, based on repeat testing among individauls	Mean time between negative and positive test among individuals	Total time between repeat test (per years)

*Excludes test results among patients known to be HIV positive (i.e., confirmatory tests)

Appendix 4: HIV treatment and management indicator definitions

Indicator	Definition	Numerator	Denominator
Proportion of HIV positive patients on HIV treatment*	Proportion of unique (i.e., individual) HIV positive patients on HIV treatment	Number of HIV positive patients on treatment	Number of HIV positive patients
HIV viral loads among HIV positive patients (overall)	Proportion of HIV positive patients with last viral load test results of <50, 50-<400, 400-10,000 and >10,000 RNA copies/mm^3 of blood	Number of HIV positive patients with last viral load test results of 50, 50-<400, 400-10,000 and >10,000 RNA copies/mm^3 of blood	Number of HIV positive patients who had a viral load test result
HIV viral loads among HIV positive patients on treatment*	Proportion of HIV positive patients on treatment with last viral load test results of <50, 50-<400, 400-10,000 and >10,000 RNA copies/mm^3 of blood	Number of HIV positive patients on treatment with last viral load test results of 50, 50-<400, 400-10,000 and >10,000 RNA copies/mm^3 of blood	Number of HIV positive patients on treatment who had a viral load test result following treatment
CD4 cell counts among HIV positive patients (overall)	Proportion of HIV positive patients with last CD4 count test results of <350, 350-499 and >500 CD4 cells/mm^3 of blood	Number of HIV positive patients with last CD4 cell count test results of <350, 350-499 and >500 CD4 cells/mm^3 of blood	Number of HIV positive patients who had a CD4 cell count test result
CD4 cell counts among HIV positive patients on treatment*	Proportion of HIV positive patients on treatment with last CD4 count test results of <350, 350-499 and >500 CD4 cells/mm^3 of blood	Number of HIV positive patients on treatment with last CD4 cell count test results of <350, 350-499 and >500 CD4 cells/mm^3 of blood	Number of HIV positive patients on treatment who had a CD4 cell count test result following treatment

* Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded