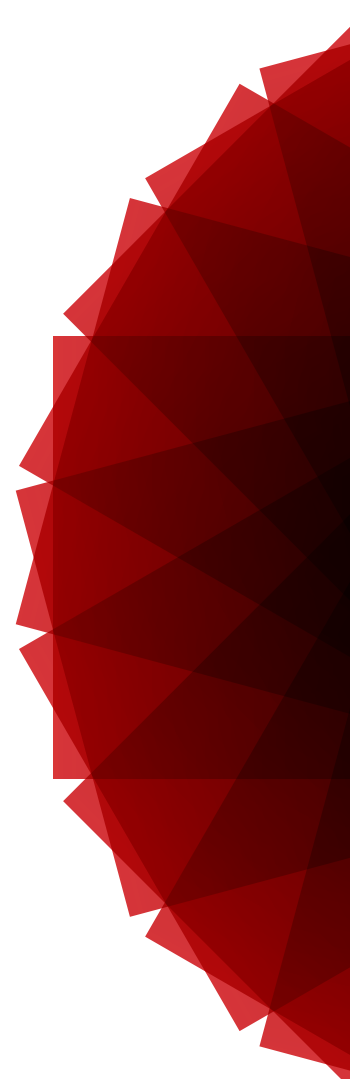


The Australian Collaboration for Coordinated Enhanced Sentinel Surveillance
of Sexually Transmissible Infections and Blood Borne Viruses

NSW HIV report 2007-2014



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

NSW HIV report 2007-2014

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Summary

Introduction

Early detection and treatment of HIV are centrepieces of an international movement to reduce rates of HIV among affected populations. Frequent testing and early treatment of those diagnosed with the virus are key components of the NSW HIV Strategy, which aims to increase antiretroviral treatment coverage to 90% of living with HIV and reduce the average time between infection and diagnosis to 1.5 years¹. Such ambitious goals are supported by mathematical modelling, which suggests that 70% treatment coverage coupled with a 30% decrease in the time from infection to diagnosis would reduce HIV incidence by up to 32%².

With new evidence confirming the public health and individual level benefits of early initiation of HIV treatment³, the push for frequent testing and early antiretroviral treatment has never been greater. To achieve these aims new HIV testing models such as SMS reminders, 'express' services and community-based testing are being developed and implemented in NSW. Additionally, evaluations have demonstrated the role of rapid testing to increase repeat HIV testing among gay and bisexual men⁴. To evaluate the uptake and impact of these strategies, there is a need for a range of indicators from different data sources to measure HIV testing, treatment and incidence.

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 bloodborne viruses (BBVs) and other sexually transmissible infections (STIs). Today, ACCESS involves over 100 sites spanning four networks of clinics and laboratories.

This report includes data from 29 sexual health clinics in NSW and 14 general practice (GP) clinics, of which three GP clinics had a high caseload of gay, bisexual and other men who have sex with men (GBM). De-identified line-data on consultations, tests, results and treatments were electronically extracted from each clinic.

Indicators relating to attendance, HIV testing, HIV test positivity, and the treatment and management of HIV are stratified by sex, HIV status, GBM status, and age. These indicators are also stratified by other priority populations: people who inject drugs (PWID), those who identify as Aboriginal or Torres Strait Islander, and female sex workers.

Among GBM, indicators are also stratified on the basis of sexual risk. Given that sexual health testing guidelines recommend annual testing for all sexually-active GBM and three to six monthly testing for those at a higher risk for infection⁵, men have been categorised as either 'high risk' or 'other risk'. This classification is done on the basis of the number of reported sexual partners in the three or 12 months prior to a consultation or a STI diagnosis. This information was only available from 2009 onward.

Regarding priority populations, it is necessary to note that classification is based on the data reported and recorded as part of clinical consultations. Depending on the service this information may have been collected via computer-assisted self-interview, patient intake and registration forms, or via discussion between patients and clinical staff. The contents of this report, therefore, reflect not necessarily the people in each of the priority populations identified above but instead the people who were identified as such via clinical data mechanisms.

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

HIV incidence was calculated among GBM via repeat testing at participating sexual health clinics. Among men with two or more HIV tests, the period of risk for infection was defined as the time between the first negative test and either the last negative test result during the observation period or a seroconversion, as confirmed by either a positive western blot or p24 antigen test or a recorded HIV diagnosis. This period defined the denominator of person years (PY) at risk compared with the number of incidence infections during that period.

1 NSW Ministry of Health. *NSW HIV Strategy 2012 - 2015: A New Era*. 2012. Sydney, NSW.

2 Jansson J, Kerr CC, Wilson DP. Predicting the population impact of increased HIV testing and treatment in Australia. *SexHealth*. 2014.

3 The INSIGHT Start Study Group. Initiation of antiretroviral therapy in early asymptomatic HIV infection. *New Eng J of Med*. 2015

4 Keen P, Jamil M, Callander D, Conway D, Guy R. *NSW Rapid HIV Testing Evaluation Framework Final Report*. 2015. Sydney, NSW.

5 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.

Results

Clinic attendance

In 2014, 32,629 individuals attended participating sexual health clinics in NSW. Of those, 67% were male and 33% were female. A total of 2,383 HIV positive patients were seen in 2014 (7% of patients) as were 12,077 GBM (37% of patients). Of GBM patients, 5,255 in 2014 were categorised as 'high risk' on the basis of their sexual practices (44% of GBM) while 358 reported recent injecting drug use (3% of GBM). Overall, 7% of all patients in 2014 were identified as female sex workers, 3% as Aboriginal or Torres Strait Islander men and women, and 1% were women and non-GBM men who reported injecting drugs in the 12 months prior to consultation.

HIV testing

Sexual health clinics

The total number of HIV tests conducted at sexual health clinics in NSW increased by 111% from 12,737 in 2007 to 26,938 in 2014. Across priority populations, the largest increase was observed among GBM, with a 298% increase in total HIV tests from 3,730 in 2007 to 14,853 in 2014. Between 2013 and 2014 alone there was a 36% increase in HIV tests among GBM.

The number of individuals tested each year increased by 247% among GBM (2,833 in 2007 to 9,835 in 2014), with a 137% increase in high risk men tested for HIV (2,289 in 2009 to 5,418 in 2014). The number of individuals tested also increased among Aboriginal males (188 in 2007 to 339 in 2014, 80% increase) but fell slightly among male injecting drug users (220 to 204, 7% decrease) and female injecting drug users (203 to 185, 9% decrease).

Uptake of HIV testing (proportion of attendees who received at least one test for HIV in that year) in HIV negative GBM patients increased 14% from 80% in 2007 to 94% in 2014 (relative increase of 18%), with the greatest increase in GBM aged 40 years and older (relative increase of 21%). Among female sex workers, testing uptake was high overall but increased from 80% in 2007 to 87% in 2014 (9% relative increase). Uptake also increased among injecting drug users, from 43% to 64% among men (45% relative increase) and from 45% to 63% among women (40% relative increase) noting the relatively low number of tests conducted among these patients compared to other populations.

Repeat testing (the proportion of attendees who received a follow-up HIV test within 6 months of a negative HIV test) also increased in GBM. Among high risk men there was a 23% relative increase in those who returned within 6 months (plus one month grace period) for a follow-up test, from 40% in the first half of 2009 to 49% in the first half of 2014 (see Figure 22). This increase equated to an average of 1.2 tests per high risk GBM in 2009 to 1.7 tests in 2014 (see Figure 14).

HIV testing among GBM was also assessed as part of a 'testing cascade' (see Figure 23). In 2014, of the 10,414 HIV negative GBM who attended a sexual health clinic in NSW, 9,835 (94%) were tested for HIV and 3,656 (35%) were re-tested at the same clinic within one year (plus one month grace period).

GP clinics

Data from GP clinics were available from 2009 onwards. At GP clinics with a high caseload of GBM there was a 49% increase in total tests among GBM between 2009 and 2014, from 2,039 to 3,039. By comparison, in the same time period at sexual health clinics there was 195% increase in total HIV tests among GBM. There was also an increase in the uptake of testing in those attending, rising from 44% in 2009 to 54% in 2014 (23% relative increase).

In the six other 'general' GP clinics (no high caseload of GBM) a small proportion of male and female patients were tested for HIV between 2009 and 2014, remaining stable at around 3-4% each year in men and 4-5% in women.

HIV positivity

Sexual health clinics

There were 100 new infections identified at participating sexual health clinics in 2014. Among GBM, HIV positivity (the proportion of unique individuals diagnosed with HIV) with HIV at sexual health clinics fell from 1.7% in 2007 to 1.0% in 2014. This decrease was mainly among GBM aged 30-39 years old, which declined from 2.2% to 1.1% during the same period while remaining generally stable among men 40 years and older. There was also a decrease in positivity in men under 30 years old, from 1.4% in 2007 to 0.9% in 2014 (see Figure 27). Among other priority populations, there were very few infections identified between 2007 and 2014 (see Figure 28).

HIV incidence

Sexual health clinics

Among GBM patients, HIV incidence peaked at 1.32/100PY in 2011 before declining to a low of 0.59/100PY in 2014 (see Figure 29). By age group, incidence in 2014 was generally comparable but lowest among men aged 40 years and older (0.49/100PY) and highest among men aged 30-39 years (0.68/100PY).

HIV treatment & management

Sexual health clinics

Between 2007 and 2014, there was a 66% increase in the number of HIV positive patients receiving treatment at sexual health clinics in NSW, from 1,083 to 1,831. Overall, the majority of people with HIV attending sexual health clinics received antiretroviral treatment (hereafter referred to as 'treatment') from that service.

Proportionally, 69% of HIV positive patients who attended a sexual health clinic in 2007 had received some treatment from that service, which rose to 80% in 2014. These data only identify patients who received treatment at the sexual health clinic and does not account for patients treated elsewhere.

In 2007, 69% of HIV positive patients had an undetectable viral load (last viral load test in year was <400 RNA copies/mm³), which increased to 87% in 2014 (relative increase of 38%). Among HIV positive patients on treatment, the proportion with an undetectable viral load increased from 75% in 2007 to 93% in 2014 (relative increase of 24%). Comparing the proportion of patients with undetectable viral load test results with those recorded as receiving treatment, it is likely that HIV treatment status is underreported in these data, which may be an artefact of shared care arrangements with other health services.

Regarding treatment, patients with HIV were organised into a 'care cascade' (see Figure 35). In 2013 and 2014, 2,294 patients were registered as receiving HIV care from a participating service. Of those, 1,831 (80%) were recorded as receiving treatment from that service, with 1,703 (93%) achieving an undetectable viral load at their last test for the year.

Conclusions

Over the past seven years, the number of individuals tested for HIV, testing coverage, and guideline-line driven re-testing has increased significantly, particularly among GBM. These increases have been observed in sexual health clinics and at general practice clinics that see large numbers of GBM. The majority of infections continue to be based among gay and bisexual men, noting that there has been a steady decline in HIV incidence among GBM following a peak in 2011.

Finally, a large proportion of HIV positive patients at sexual health clinics in NSW appear to be receiving treatment from those services, which has increased steadily each year, reaching at least 80% of patients attending a sexual health clinic in 2014 and successfully controlling the infection ('viral suppression') in 93% of patients on treatment.

Report notes

Overview of indicators and networks

Indicator	Sexual health clinic 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	✓	-	-

Population	Sexual health clinics network	High caseload GP Network	GP Network
Sex	✓	✓	✓
Age group	✓	✓	✓
GBM	✓	✓	-
Priority populations: Aboriginal people People who inject drugs (PWID) Female sex workers	✓	-	-

Definitions

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.

Patient categorisation in the following priority populations relies on patient data collected and recorded as part of clinical encounters. Population estimates may, therefore, underrepresent attendees within the following categories.

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. Priority populations other than GBM exclude GBM.
High risk GBM⁶	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	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

6 '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

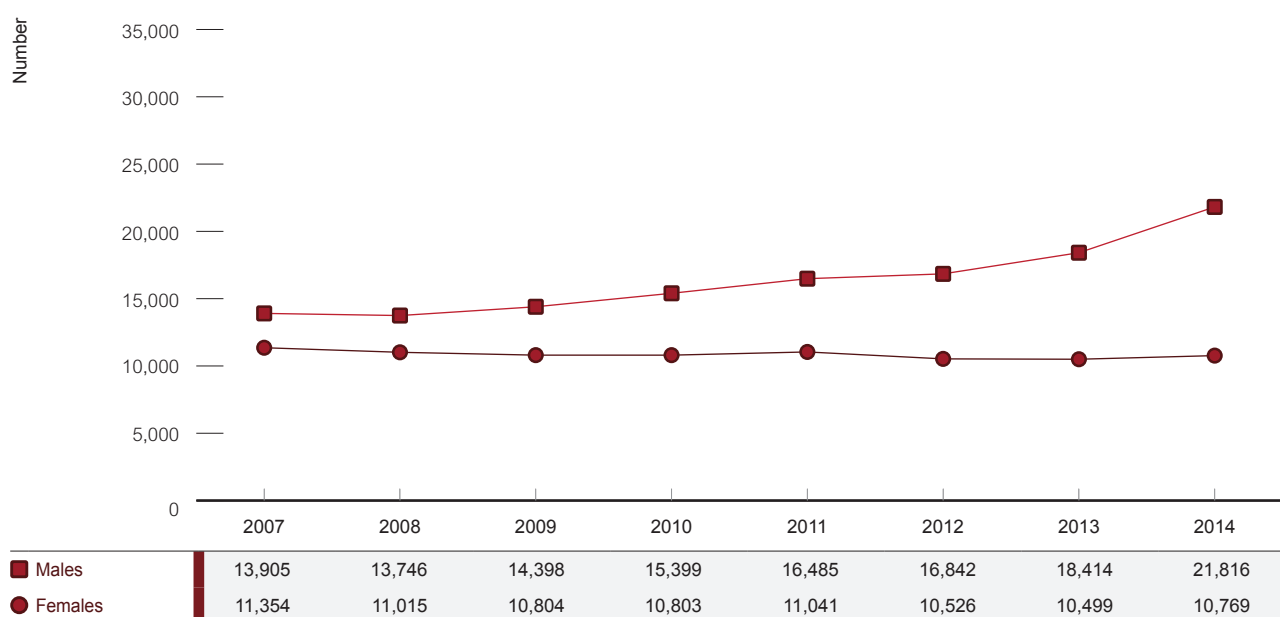
The data presented in this section of the report were drawn from the ACCESS sexual health clinic network, representing 29 clinics in NSW. Where possible all data are presented in 12-month periods from 2007 to 2014 and stratified by sex, HIV status, age, GBM and among other priority populations. Indicators 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 sexual health clinics in NSW. 'Unique' means a patient who is unique to a single clinic as each clinic generates their own patient identifier and if a person attended multiple services they were counted twice.

Between 2007 and 2014, the number of individual patients increased by 29%. In males, there was a 57% increase between 2007 and 2014, and among females the number of attending patients remained stable.

Figure 1 Number of unique patients* seen at sexual health clinics in NSW, by sex** and year, 2007-2014

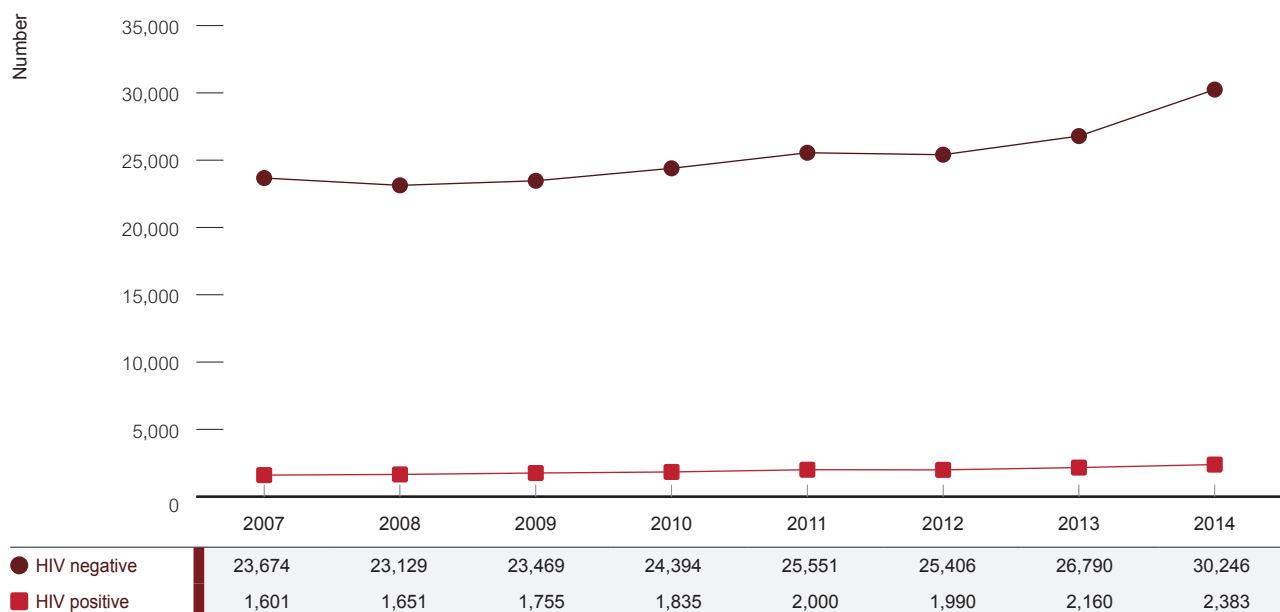


* 'Unique' patients were only identified within each service

**Does not include patients of unknown sex

There was a greater increase in the number of HIV positive patients seen compared to HIV negative patients: attending HIV positive patients increased 49% from 2007 to 2014 and 28% among HIV negative patients. Attendance among HIV negative patients, however, increased 20% from 2012 to 2014.

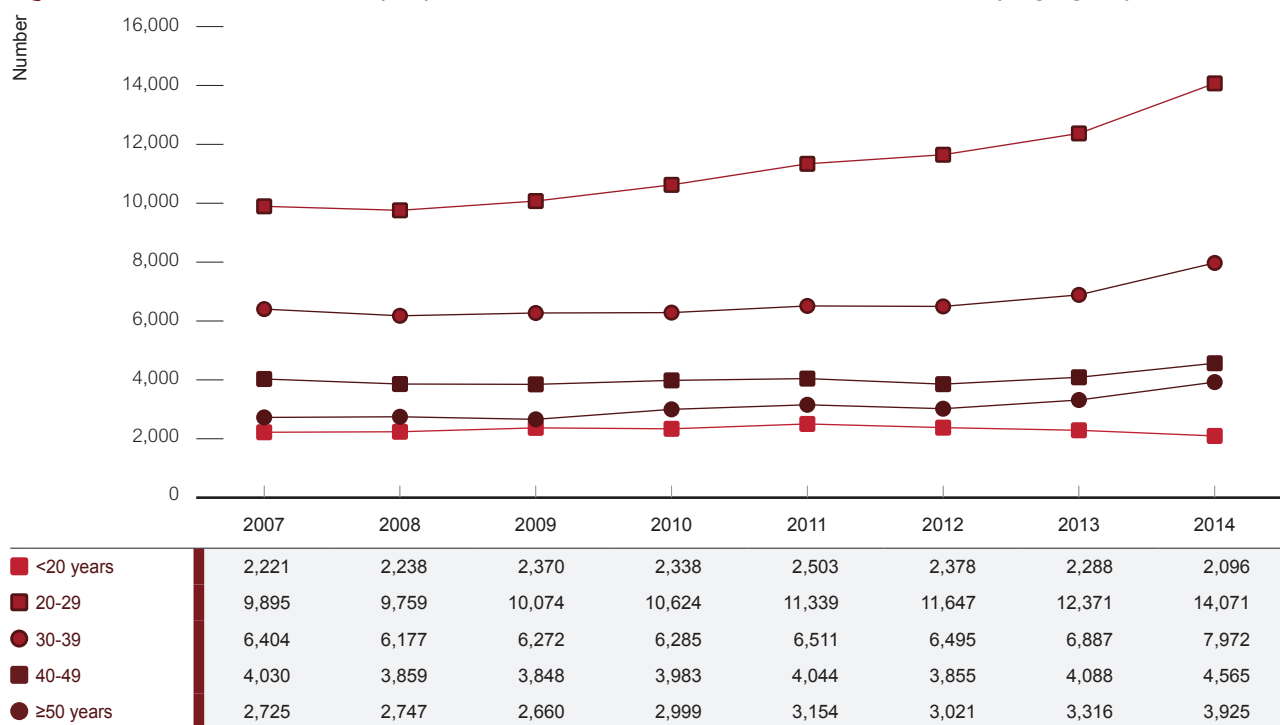
Figure 2 Number of unique patients* seen at sexual health clinics in NSW, by HIV status and year, 2007-2014



* 'Unique' patients were only identified within each service

Figure 3 shows that the greatest increase in patients was among those aged 20-29 years, rising by 42% from 2007 to 2014 while the number of patients under 20 years old declined by 6%.

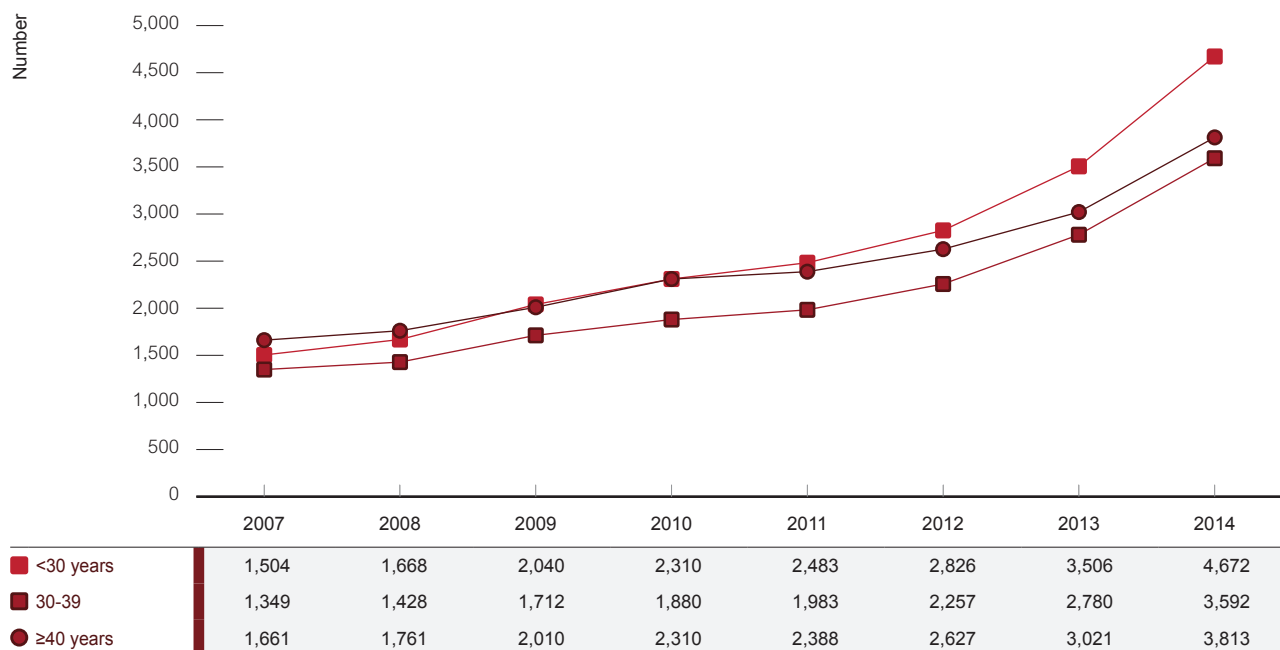
Figure 3 Number of unique patients* seen at sexual health clinics in NSW, by age group, 2007-2014



* 'Unique' patients were only identified within each service

Overall, the number of GBM seen at sexual health clinics increased 168% between 2007 and 2014, with a large increase of 211% among men under 30 years old. In 2014, 39% of attending GBM were under 30 years old, 30% were aged 30-39 years, and the remaining 32% were 40 years and older.

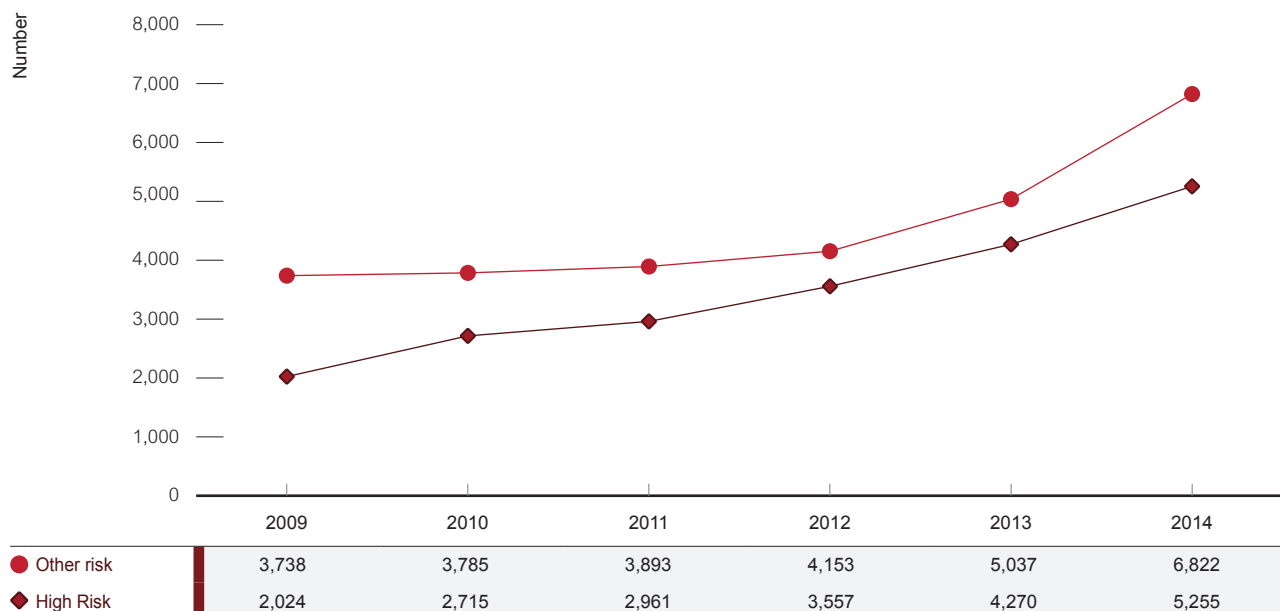
Figure 4 Number of unique GBM* seen at sexual health clinics in NSW, by age group and year, 2007-2014



* 'Unique' patients were only identified within each service

Among GBM, the number of men classified as 'high risk' increased 160% from 2,024 in 2009 to 5,255 in 2014, which compared to an 83% increase in 'other risk' men (Figure 5). The greatest observed increase among other priority populations was in Aboriginal men (78% increase; Figure 6).

Figure 5 Number of unique GBM* seen at sexual health clinics in NSW, by risk category** and year, 2009-2014***

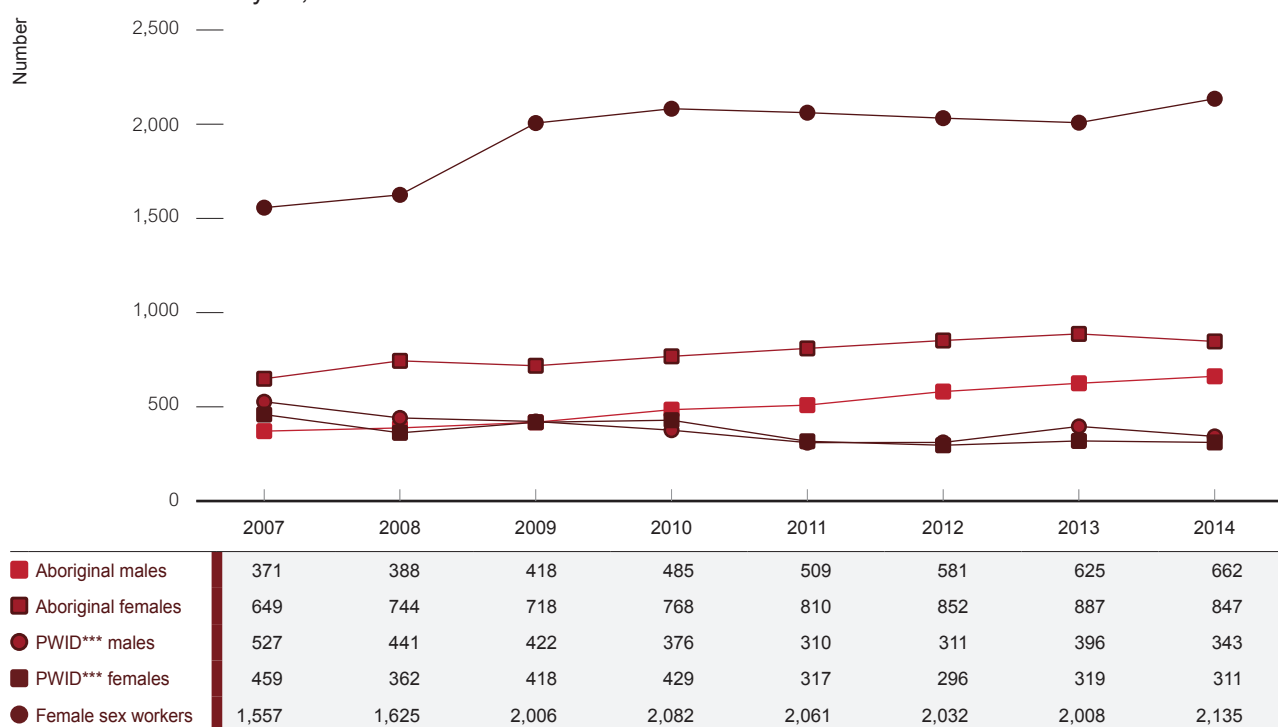


* 'Unique' patients were only identified within each service

** '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

Figure 6 Number of unique patients* seen at sexual health clinics in NSW, by priority population** and year, 2007-2014



* 'Unique' patients were only identified within each service

** Excludes GBM; priority classifications are not mutually exclusive

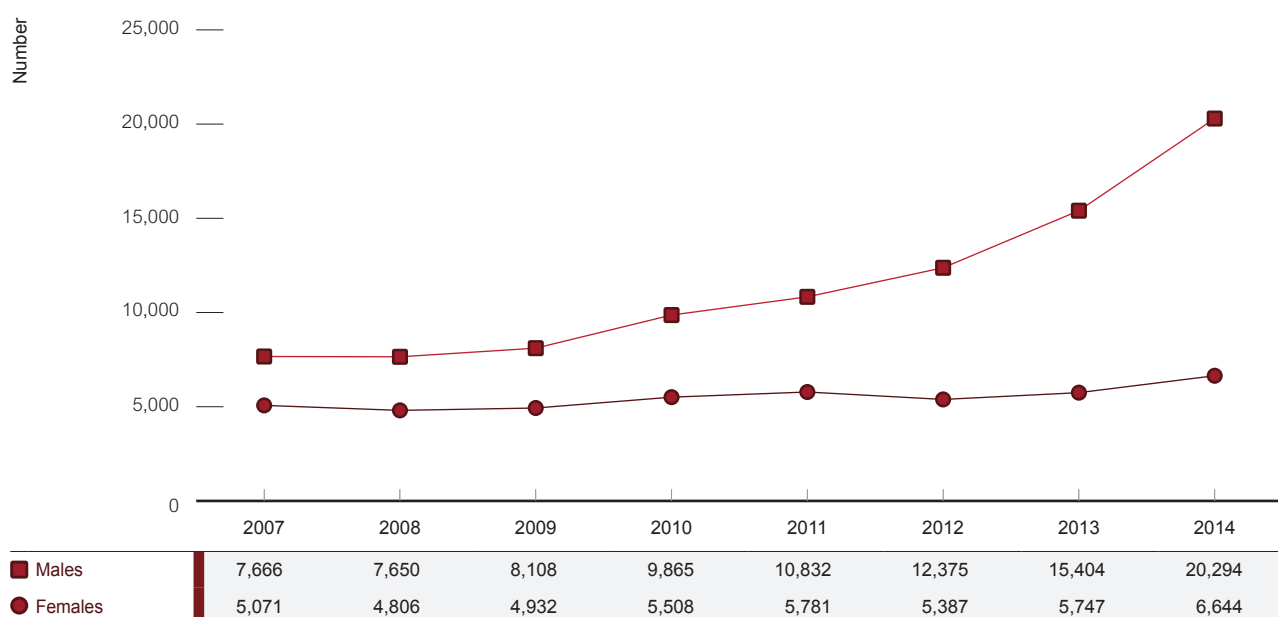
***People who inject drugs

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.

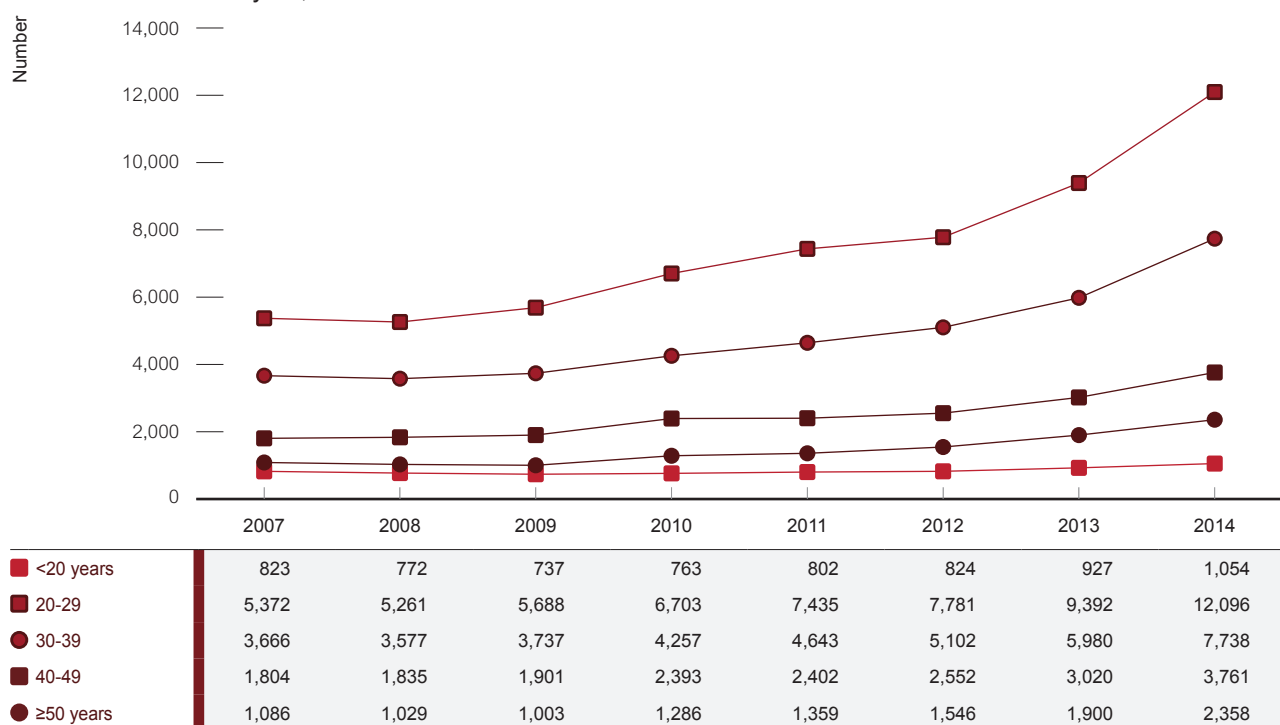
Overall, 26,938 HIV tests were conducted in 2014, representing an 111% increase from the 12,737 tests conducted in 2007. Although tests among female patients increased by 31%, there was a far greater increase among male patients (165% increase; Figure 7). By age, the greatest increase was observed among patients aged 20-29 years (125% increase; Figure 8).

Figure 7 Total number of HIV tests in patients seen at sexual health clinics in NSW, by sex* and year, 2007-2014



* Does not include patients of unknown sex

Figure 8 Total number of HIV tests in patients seen at sexual health clinics in NSW, by age group and year, 2007-2014



Between 2007 and 2014, the number of tests conducted among GBM rose by 298%, with a 334% increase in test numbers among men under 30 years old, a 283% increase in 30-39 year olds, and a 265% increase in men 40 years and older (Figure 9). In 2014, 43% of tests were among men under 30 years old.

In other priority populations, the greatest increase in the number of tests from 2007 to 2014 was in Aboriginal males (86% increase) and Aboriginal females (64% increase; Figure 10).

Figure 9 Total number of HIV tests in GBM seen at sexual health clinics in NSW, overall and by age group and year, 2007-2014

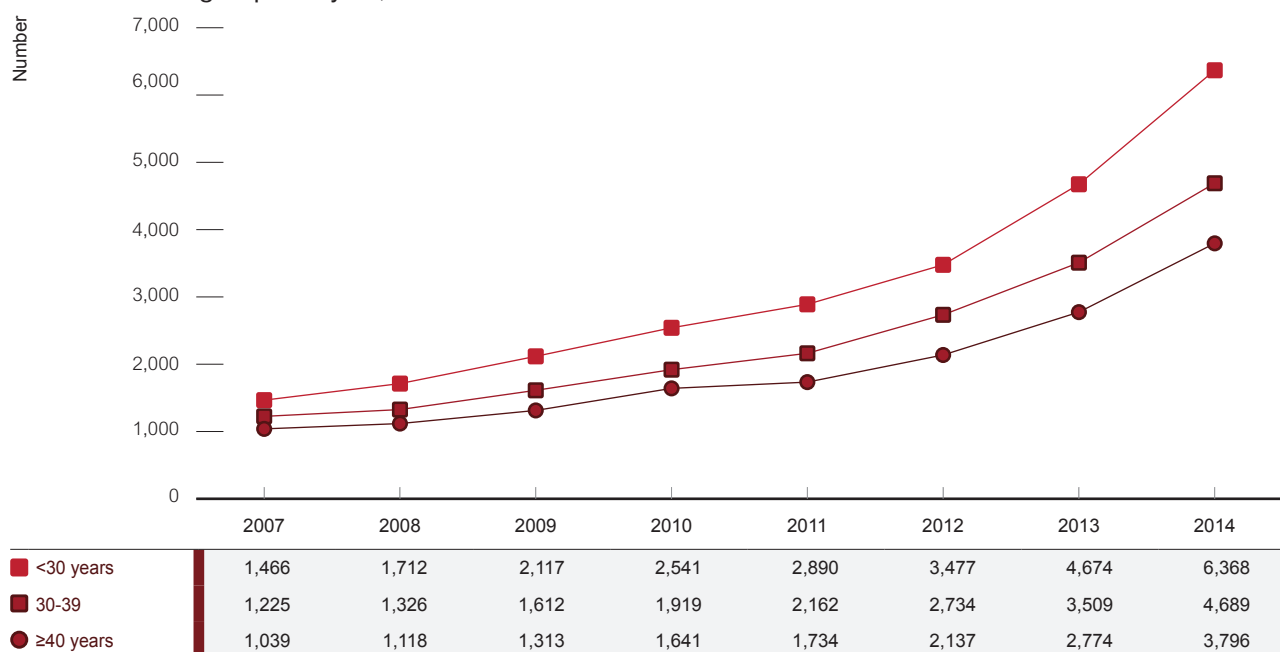
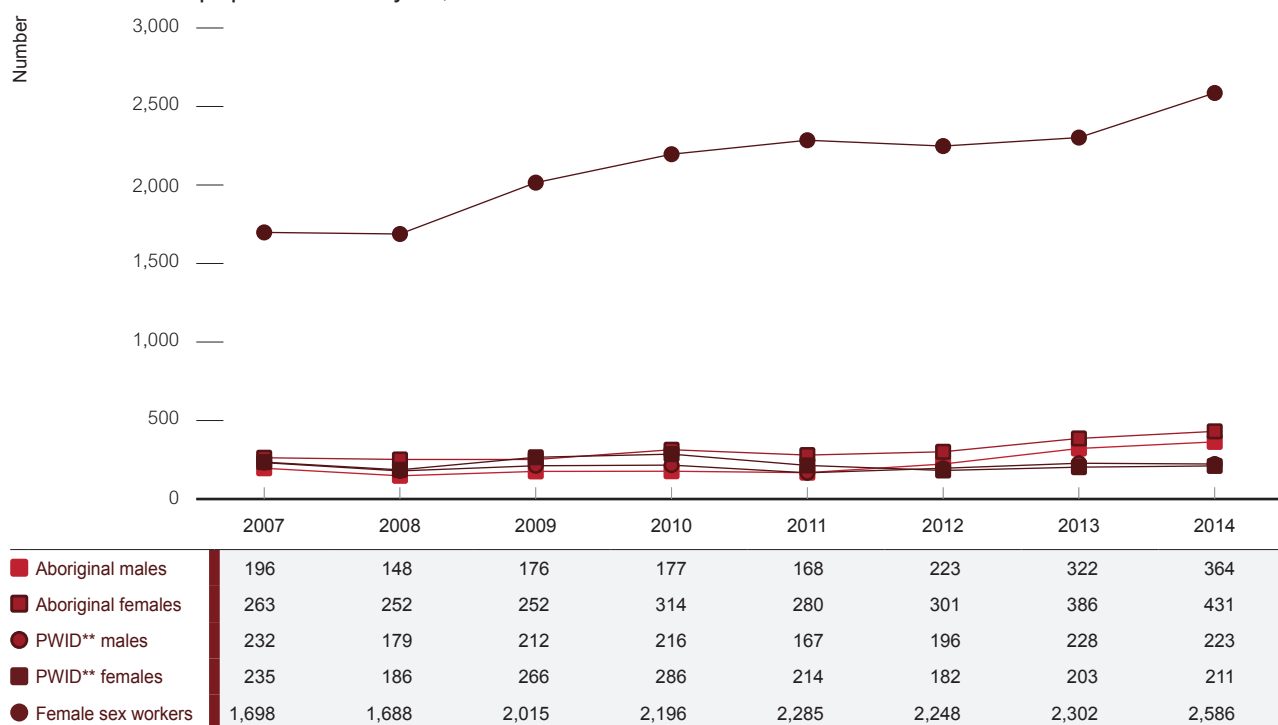


Figure 10 Total number of HIV tests in patients seen at sexual health clinics in NSW, by priority population* and year, 2007-2014



* Excludes GBM; priority classifications are not mutually exclusive

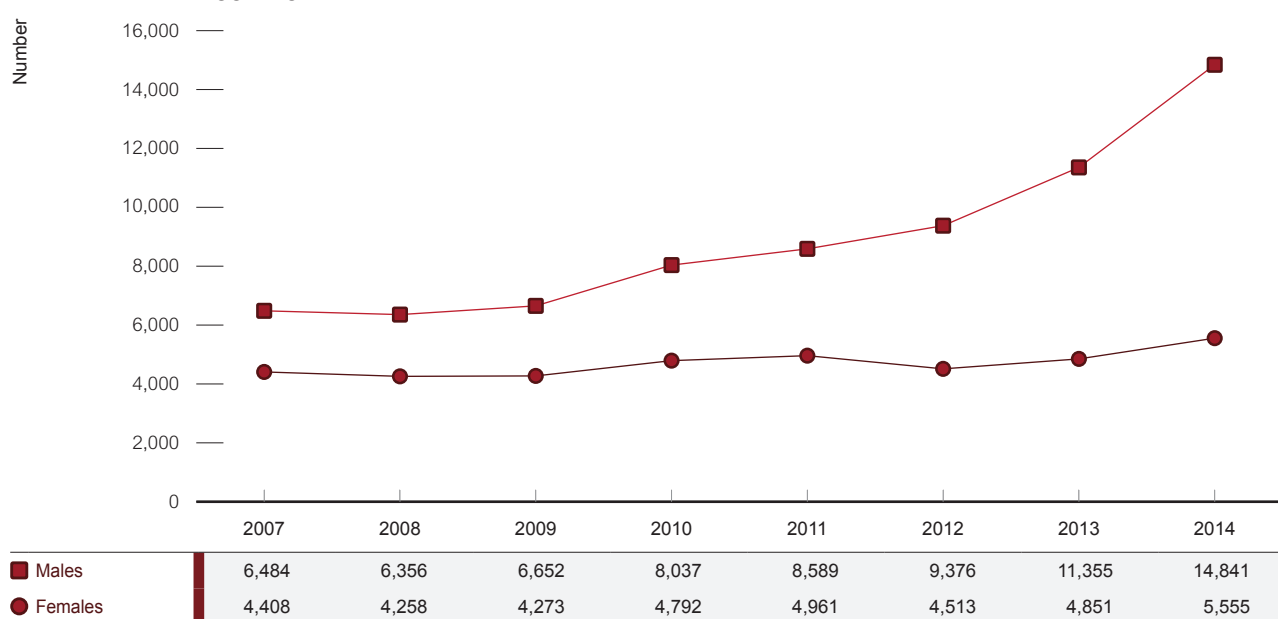
** People who inject drugs

Unique patients tested for HIV

The following graphs show the number of unique patients who were tested for HIV in a year. As with the previous section, 'unique' refers to patients within each service. Thus, if a patient 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.

The number of unique patients tested for HIV increased substantially from 2007 to 2014, rising 129% among men and 26% among women. Among male patients, there was a 73% increase in those tested between 2012 and 2014 alone.

Figure 11 Number of unique patients* tested for HIV at sexual health clinics in NSW, by sex** and year, 2007-2014

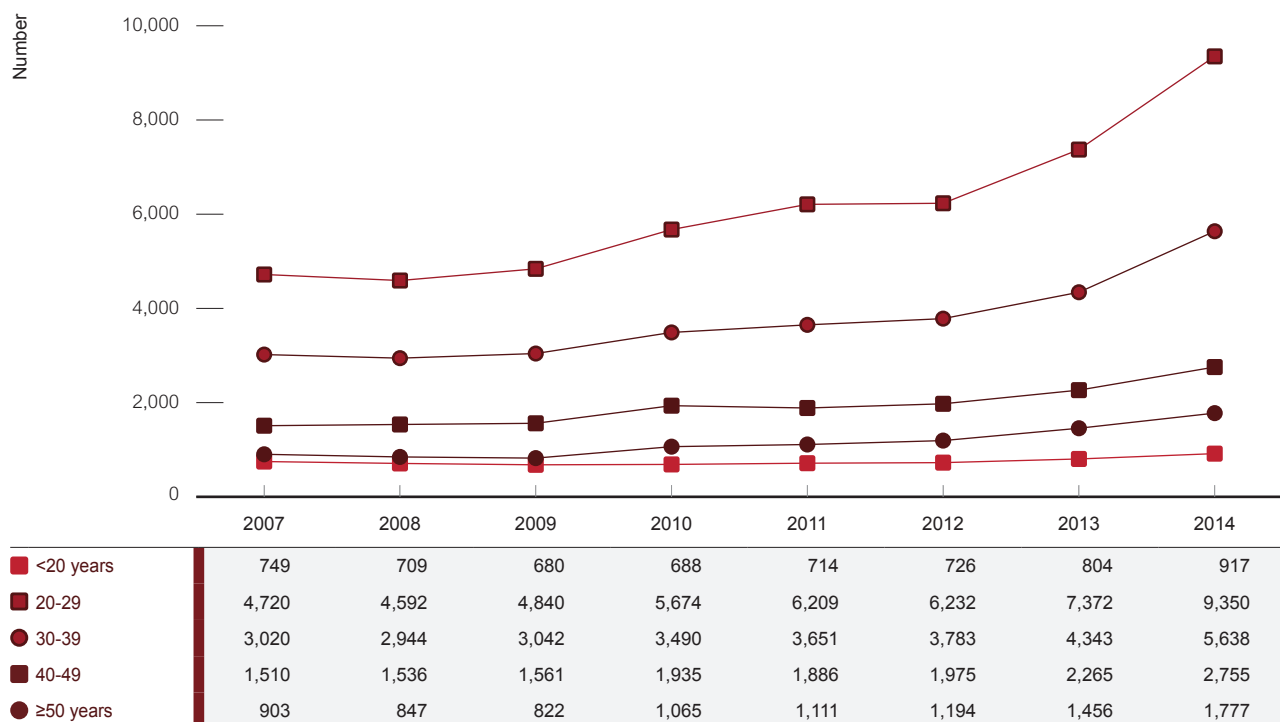


* 'Unique' patients were only identified within each service

** Does not include patients of unknown sex

The greatest increase in individuals tested was among those aged 20-29 years and those 50 years and older (98% and 97% increases, respectively). The smallest was among those aged 20 years and younger (22% increase).

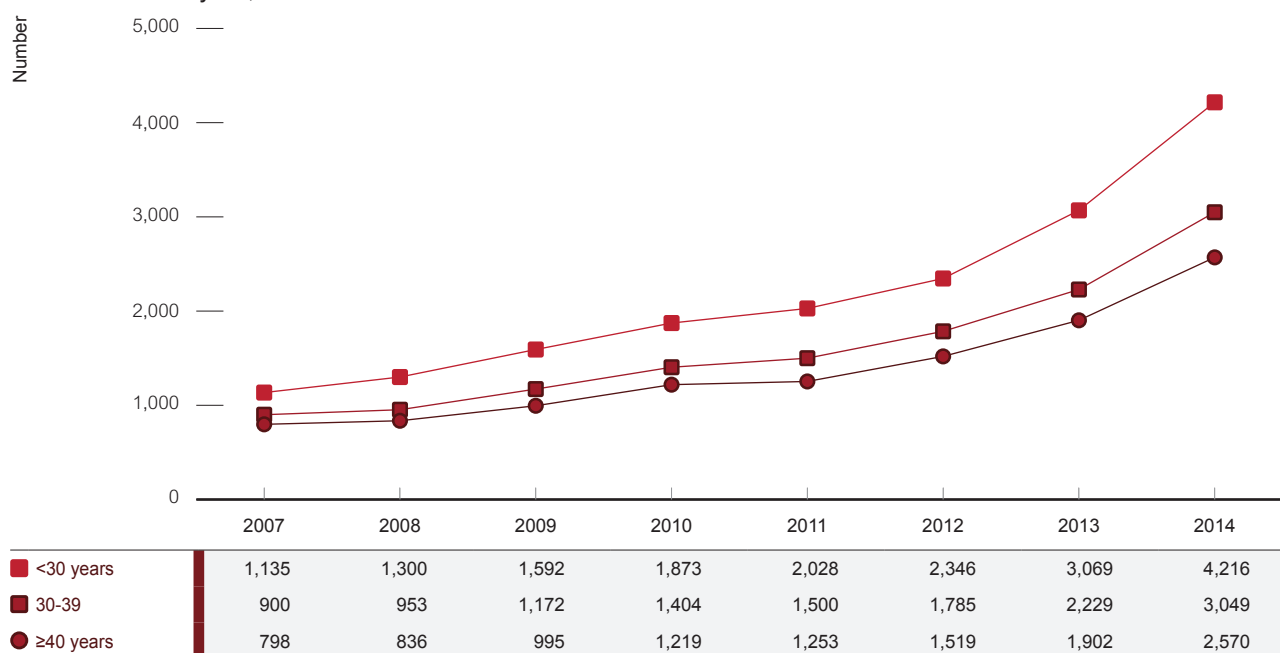
Figure 12 Number of unique patients* tested for HIV at sexual health clinics in NSW, by age group, 2007-2014



* 'Unique' patients were only identified within each service

Among GBM, the number of unique patients tested for HIV rose 247% from 2007 to 2014: 271% among men under 30 years old, 239% in 30-39 year olds, and 222% in men over 40 years. In 2014, 43% of unique GBM tested were under 30 years old.

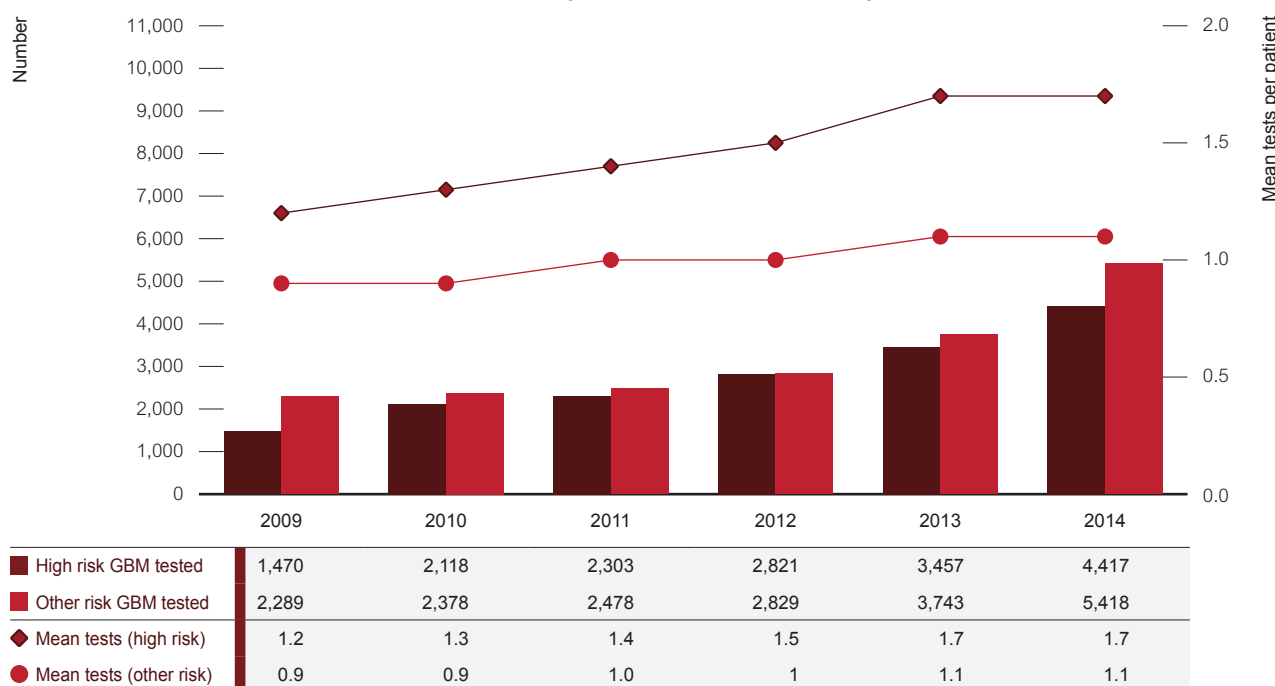
Figure 13 Number of unique GBM* tested for HIV at sexual health clinics in NSW, by age group and year, 2007-2014



* 'Unique' patients were only identified within each service

The number of high risk GBM tested in 2014 rose 200% from 1,470 in 2009 to 4,417 in 2014. Among high risk GBM, the mean number tests per patient per year increased from 1.2 tests per year in 2009 to 1.7 in 2014.

Figure 14 Number of unique GBM* tested for HIV and mean number of tests per patient per year at sexual health clinics in NSW, by risk classification** and year, 2009-2014***



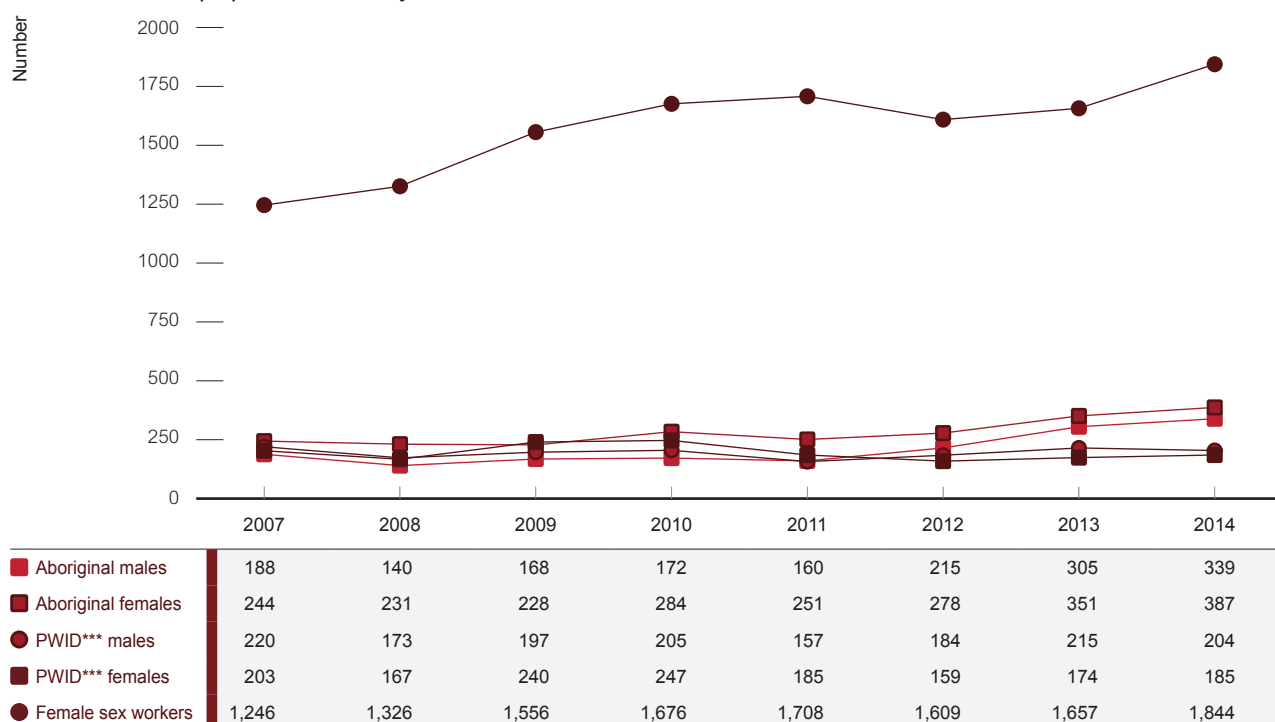
* 'Unique' patients were only identified within each service

** '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

The number of unique female sex workers who were tested for HIV increased by 48% from 2007 to 2014. During that same period there was a 80% increase in number of unique Aboriginal males tested for HIV at NSW sexual health clinics, a 59% increase among Aboriginal females, and 7% and 9% decreases among male and female injecting drug users, respectively.

Figure 15 Number of unique patients* tested for HIV at sexual health clinics in NSW, by priority population** and year, 2007-2014



* 'Unique' patients were only identified within each service

** Excludes GBM; priority classifications are not mutually exclusive

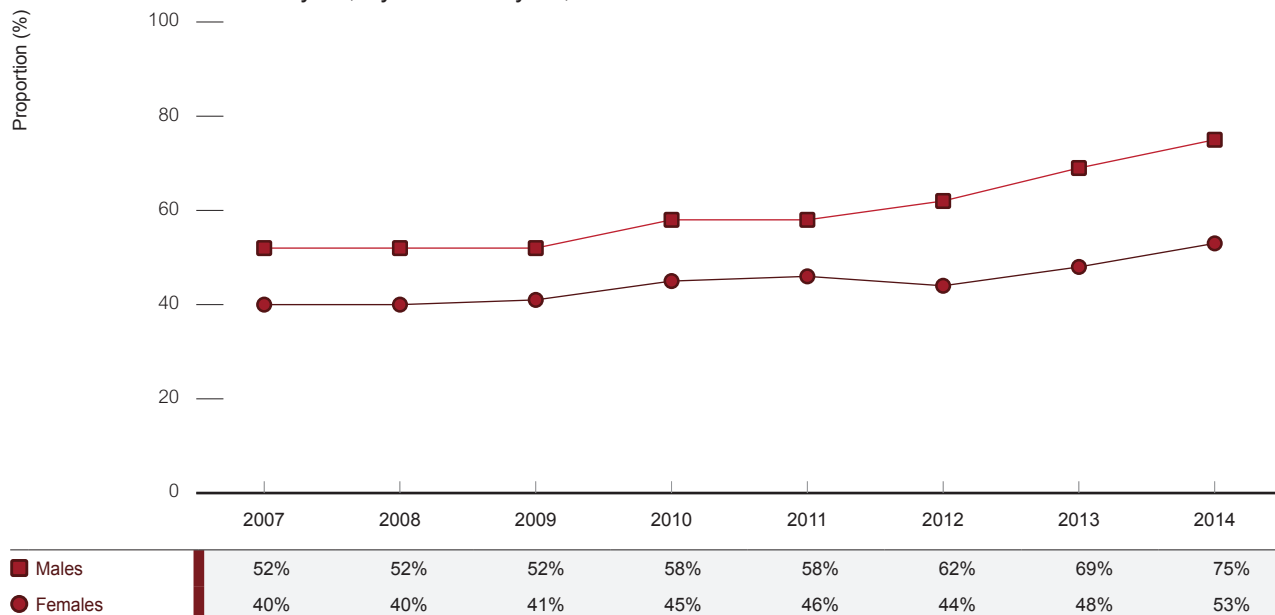
***People who inject drugs

Proportion tested for HIV (uptake)

This section details the proportion of unique HIV negative patients who attended a participating sexual health clinic at least once in a 12-month period and received at least one HIV test ('testing uptake').

Overall, testing uptake increased by a relative proportion of 48% from 2007 to 2014, with the greatest change in male patients (44% 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, 2007-2014

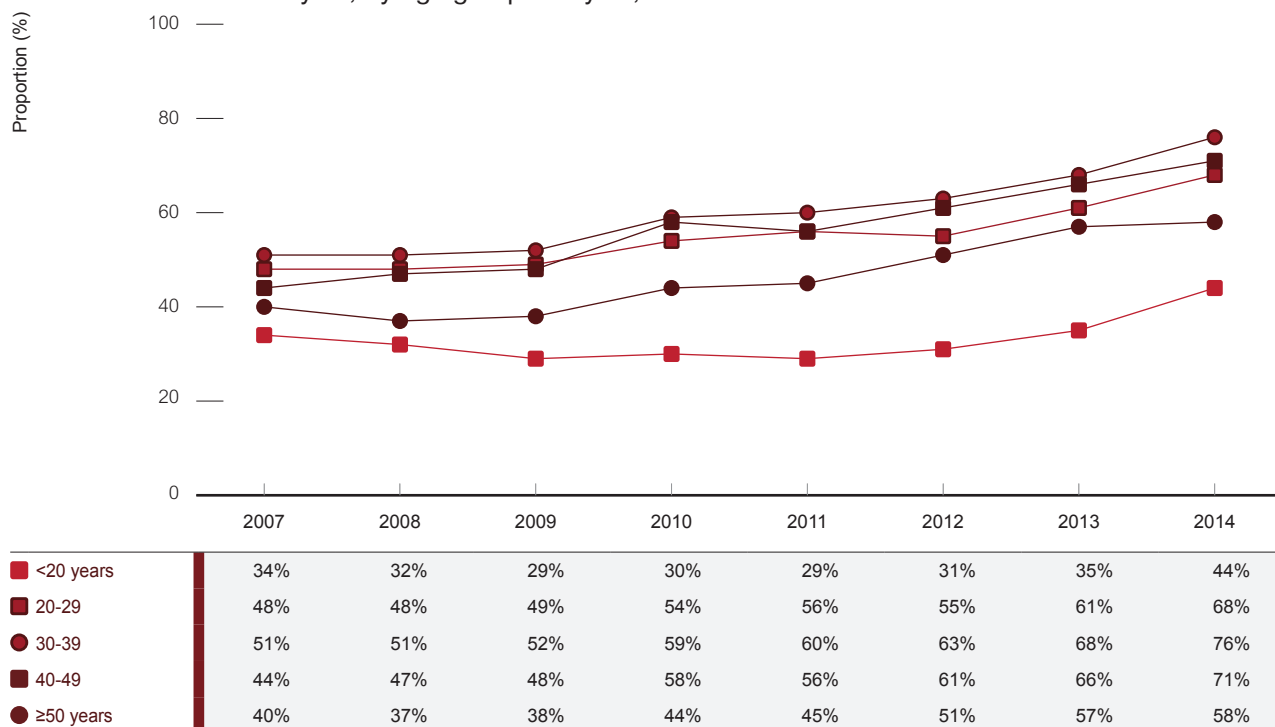


* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals

** Does not include patients of unknown sex

Figure 17 shows the proportion of unique patients tested for HIV at NSW sexual health clinics by age group. The greatest increase in HIV testing uptake was seen among those aged 40- 49 years (61% relative increase), followed by those aged 30-39 years (49% relative increase) and those aged 50 years and older (45% relative increase).

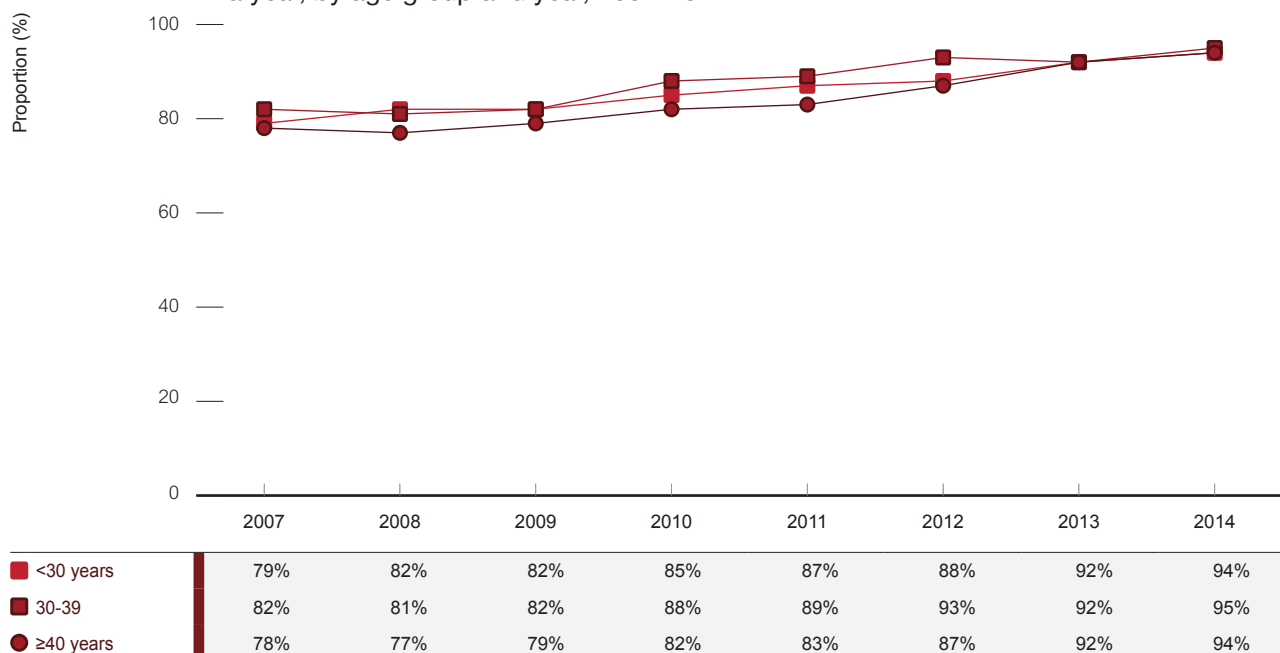
Figure 17 Proportion of unique patients* attending a sexual health clinic in NSW who were tested for HIV in a year, by age group and year, 2007-2014



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

The proportion of GBM tested for HIV increased, relatively, by 18% from 2007 to 2014. The greatest increase was among patients aged 40 years and older (21% relative increase).

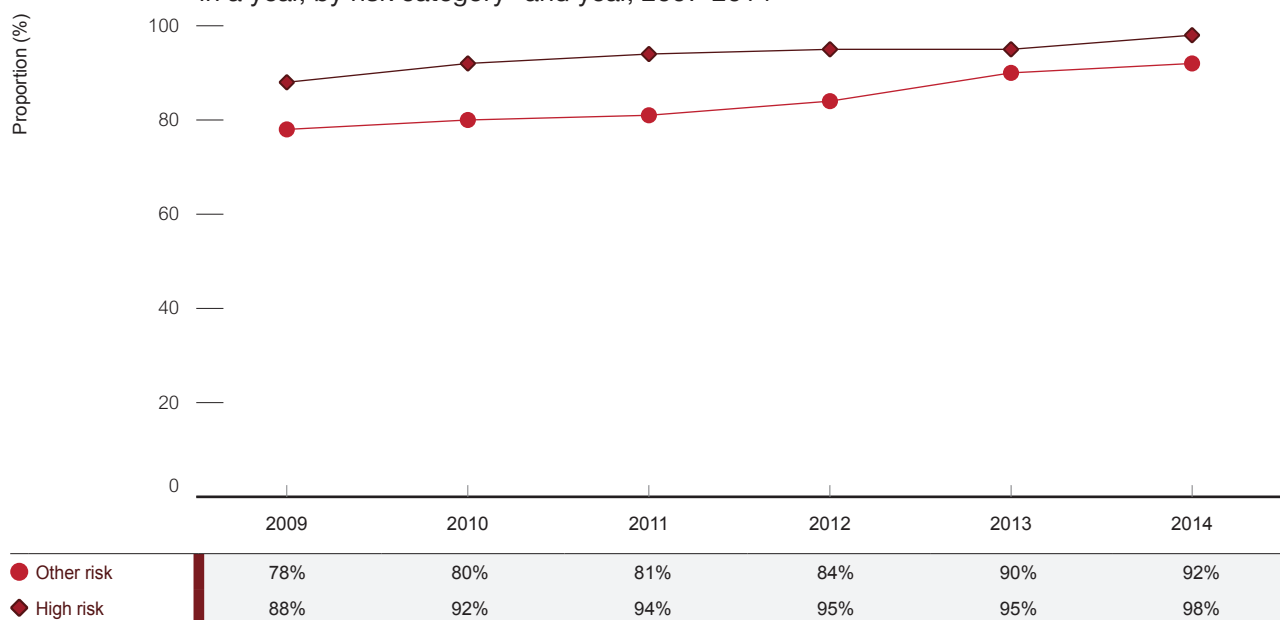
Figure 18 Proportion of unique GBM* attending a sexual health clinic in NSW who were tested for HIV in a year, by age group and year, 2007-2014



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

The uptake of HIV testing among high risk GBM increased by 11% relatively from 2007 to 2014 (reaching 98% in 2014), and by 18% relatively among GBM with other risk profiles.

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, 2007-2014***



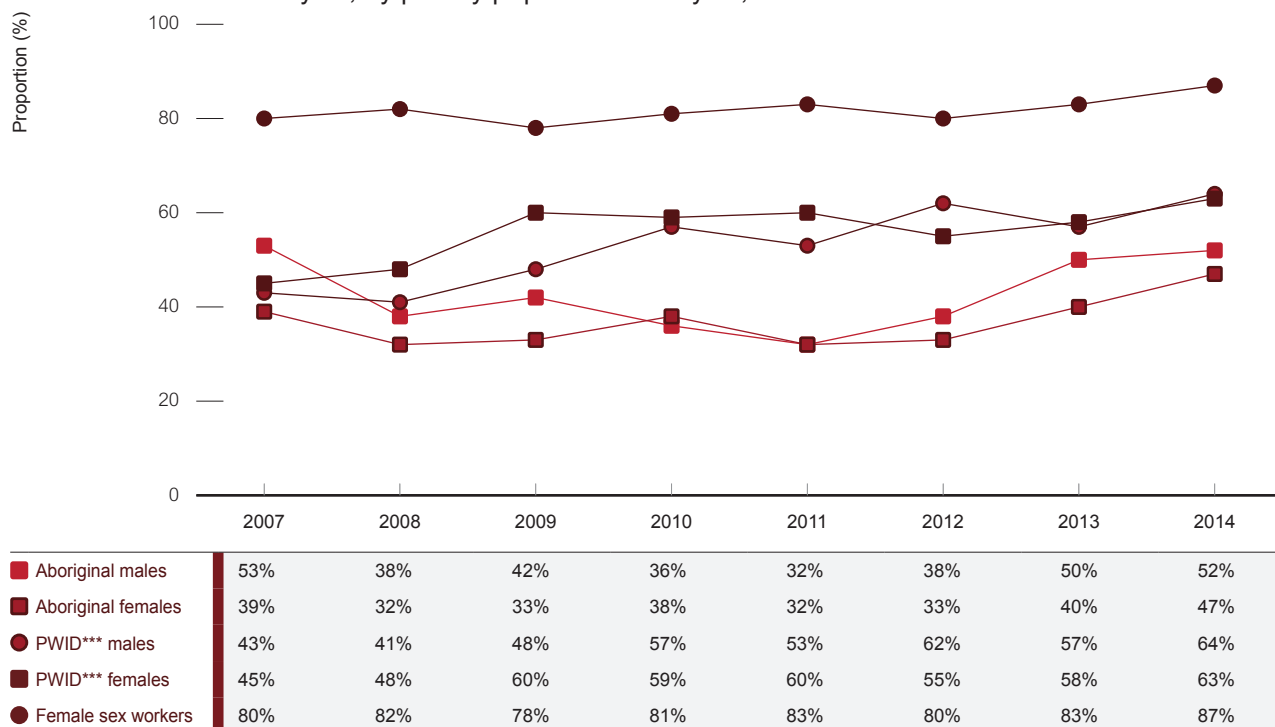
* 'Unique' patients were only identified within each service; excluding (diagnosed) HIV positive individuals

** '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

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

Figure 20 shows that among other priority populations testing uptake was highest in female sex workers, with a 9% relative increase between 2007 and 2014. The greatest increase in HIV testing uptake was among male injecting drug users (45% relative increase) and female injecting drug users (40% relative increase).

Figure 20 Proportion of unique patients* attending a sexual health clinic in NSW who were tested for HIV in a year, by priority population** and year, 2007-2014



* 'Unique' patients were only identified within each service

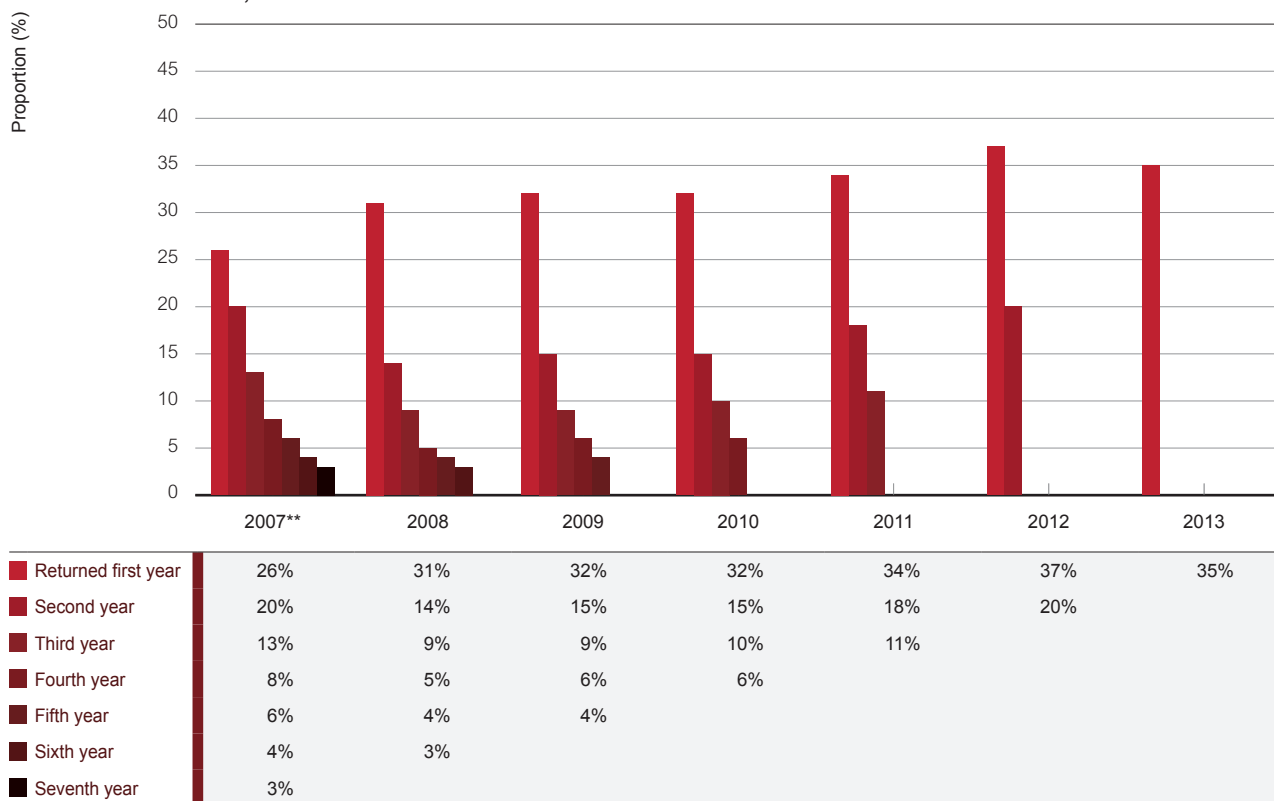
** Excludes GBM; priority classifications are not mutually exclusive

***People who inject drugs

Re-testing for HIV among GBM

Figure 21 represents a longitudinal analysis of annual HIV testing among GBM attending sexual health clinics. Each year represents the first year that an individual was tested at a participating service and the proportions represent those who returned annually for a subsequent HIV test at the same service. If a patient skipped a test in one or more years they were excluded. For example, of the GBM who received an HIV test in 2007, 37% returned in 2008 for a subsequent test, and 21% returned again in 2009, and 14% returned in 2010. This proportion represents four years of consecutive testing for those men. Only 3% of men tested in 2007 returned every year from 2007 to 2014 for an HIV test at the same clinic. Patients identified as travellers (i.e., non-residents) in the dataset were excluded from this analysis as were those diagnosed with HIV, as they would not have had a reason to return for a subsequent test.

Figure 21 Proportion of HIV negative GBM tested for HIV at least once each year*, by year of initial test, 2007-2013



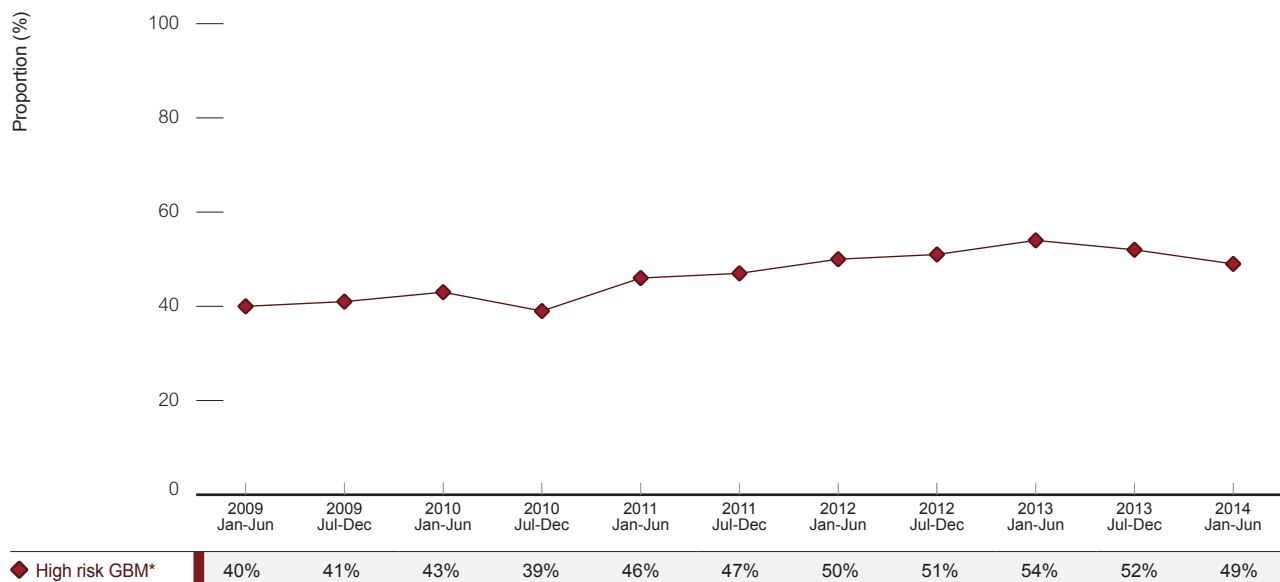
* Accounts only for patients re-tested at the same service

** Represents year of first HIV test at service

Sexual health testing guidelines recommend annual testing for HIV among sexually-active GBM and three to six monthly testing among men whose sexual practices place them at higher risk for HIV and other STIs⁷. The following figure reports on HIV re-testing at six months for high risk GBM, allowing a one month grace period. Patients whose initial test for HIV was positive were excluded. Tests conducted within six 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.

Since the start of 2009, the proportion of high risk men returning for a repeat HIV test within 6 months increased by 23%, from 40% in the cohort of men tested in the first half of 2009, to 49% in the first half of 2014.

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***, 2009-2014



* 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

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

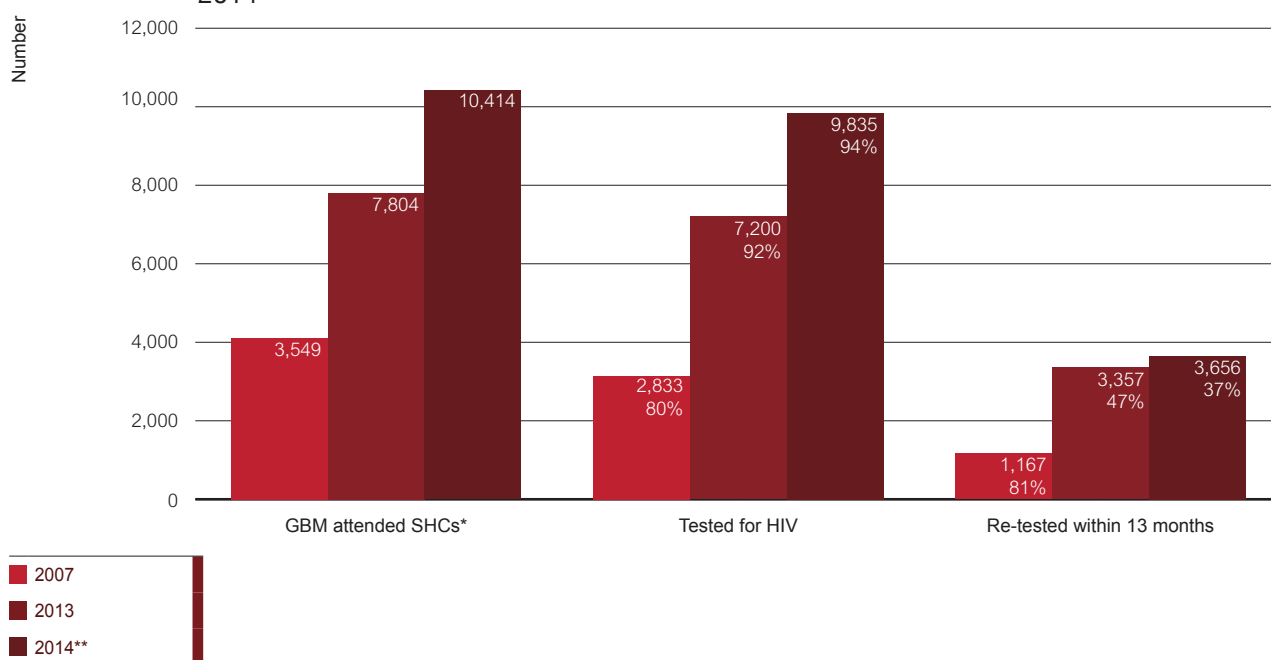
7 Templeton DJ, Read P, Varma R, Bourne C. Australian sexually transmissible infection and HIV testing guidelines for asymptomatic men who have sex with men 2014: a review of the evidence. *Sexual Health*. 2014;11(3):217-29.

HIV testing cascade'

The following section details the HIV 'testing cascade' for GBM attending sexual health clinics 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 12 months (plus one month grace period) at the same service.

Between 2007 and 2014, the proportion of attending GBM tested for HIV and the proportion re-tested within 13 months increased considerably. Of the 10,414 HIV negative GBM who attended a sexual health service in NSW in 2014, 94% were tested for HIV and 37% of those men returned for a re-test at the same service within 13 months. Because re-testing is calculated prospectively, the proportion re-tested in 2014 is likely to be an underestimation due to insufficient follow up time.

Figure 23 HIV 'testing cascade' for GBM attending sexual health clinics in NSW, 2007, 2013 and 2014



* Excludes patients with HIV

** Given the 13-month re-testing period, re-testing in 2014 is a likely underestimation

HIV positivity

This section reports on positive HIV tests and diagnoses. 'New' positive results exclude confirmatory HIV testing (i.e., HIV tests among patients known to be HIV positive) and draw upon recorded clinical diagnoses and/or pathology confirmed by either a western blot or p24 antigen test. 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,
- 'Unique positivity' calculates the proportion of unique individuals tested each year with positive results.

Overall, unique and total positivity remained low among female patients ($\leq 0.1\%$ each year) while unique positivity was higher among male patients, fluctuating between 0.6% and 1.0% (Figure 24). Almost all new HIV diagnoses at sexual health clinics were among male patients (Table 1).

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, 2007-2014



* 'Unique' patients were only identified within each service

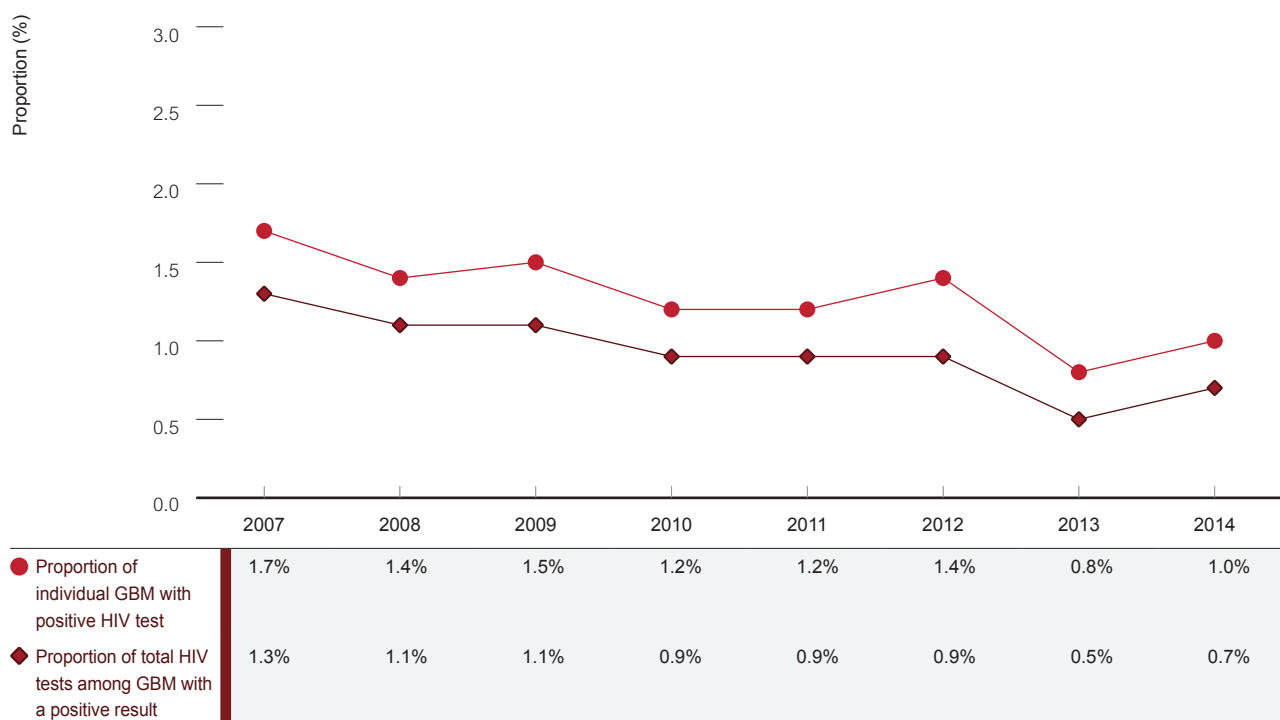
Table 1 Number of new HIV diagnoses* at sexual health clinics in NSW, by sex and year, 2007-2014

	2007	2008	2009	2010	2011	2012	2013	2014
Male patients	58	51	68	64	77	88	72	95
Female patients	<5	5	5	<5	5	<5	<5	5

* These frequencies rely partly on recorded clinical information; differences in recording between and within services may result in inconsistencies with other reporting mechanisms

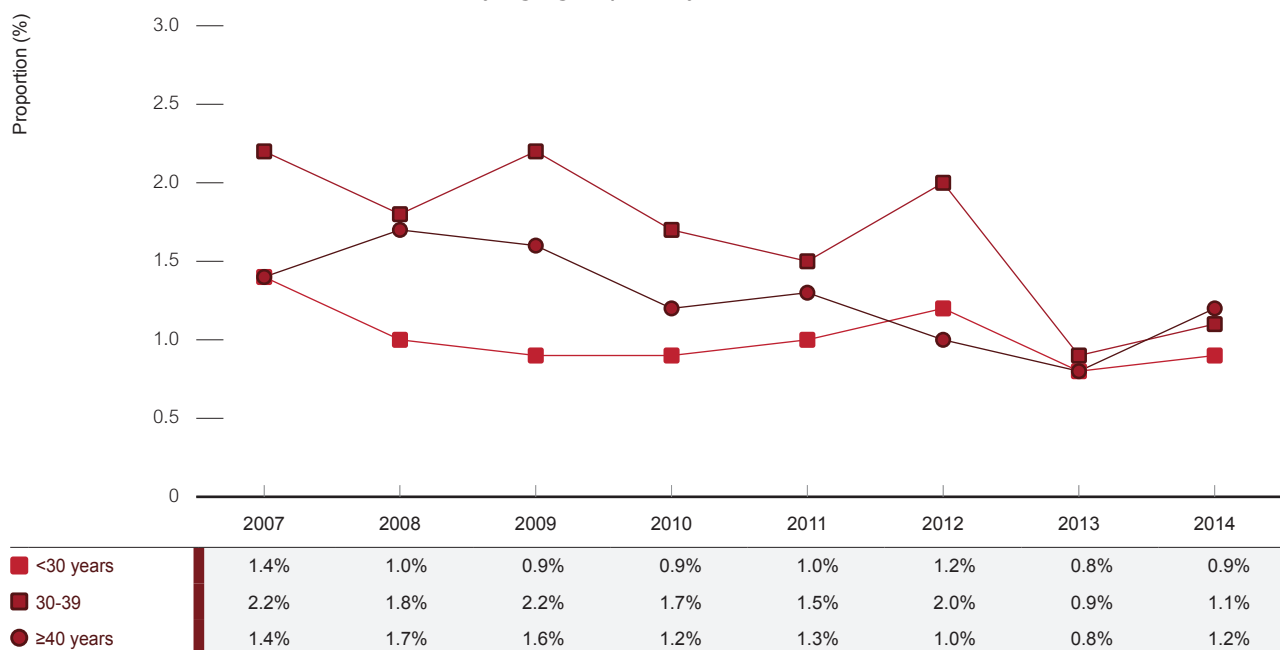
Both unique and total HIV positivity among GBM decreased from 1.7% in 2007 to 1.0% in 2014 and 1.3% to 0.7%, respectively.

Figure 25 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, 2007-2014



* 'Unique' patients were only identified within each service

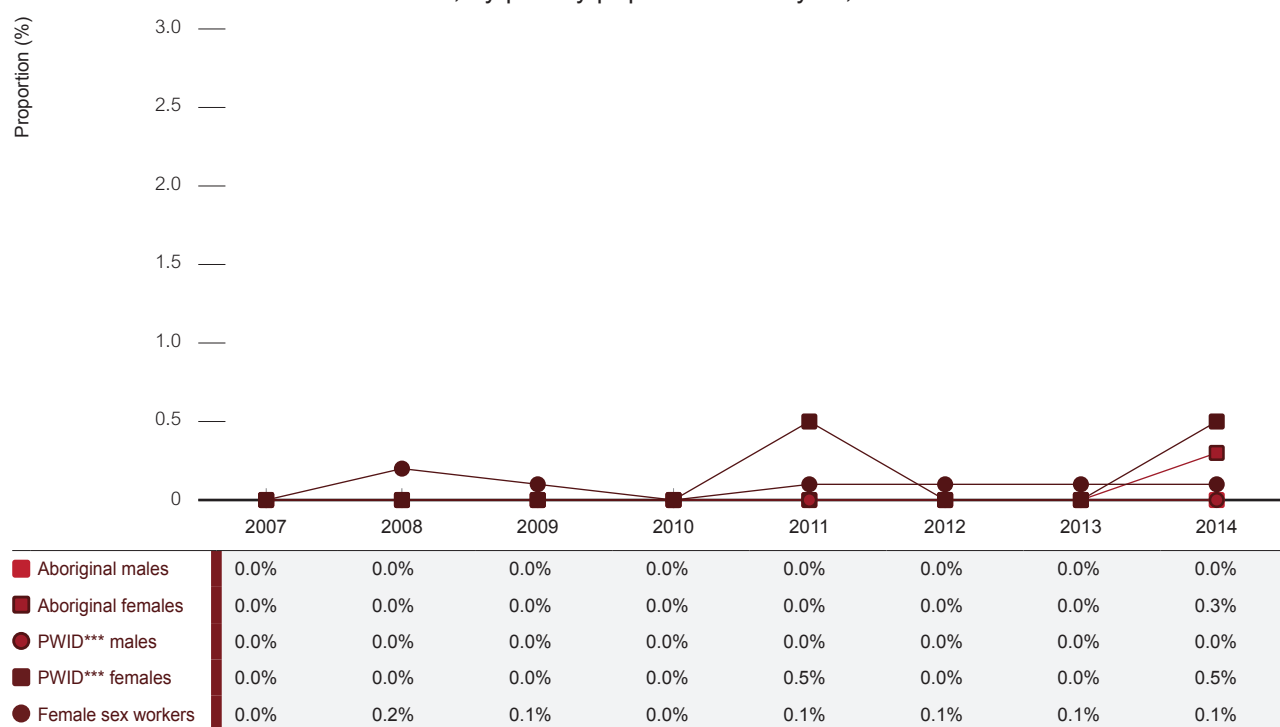
Figure 26 Proportion of unique GBM patients* tested for HIV with a positive HIV test result at sexual health clinics in NSW, by age group and year, 2007-2014



* 'Unique' patients were only identified within each service

Among other priority populations, very few HIV infections were detected, with between zero and two diagnoses each year.

Figure 27 Proportion of unique patient^{*} tested[†] for HIV with a positive HIV test result at sexual health clinics in NSW, by priority population^{**} and year, 2007-2014



* 'Unique' patients were only identified within each service

** Excludes GBM; priority classifications are not mutually exclusive

***People who inject drugs

HIV incidence among GBM

HIV incidence among GBM at participating sexual health clinics was calculated for 2007 – 2014. Incidence was calculated using a recorded clinical diagnosis or a positive HIV test (as confirmed by either a western blot or p24 antigen test) among patients with a previous negative test. This use of 'repeat testing' means that patients were considered at risk for infection from the point of their first negative test and either their confirmed positive (seroconversion) or latest negative test. The median time between a patient's most recent negative test and a confirmed positive result was used to calculate incidence, as expressed per 100 person years (PY) of risk.

Among GBM, incidence peaked in 2011 before declining steadily each year following, noting overlapping confidence intervals between 2011 and 2014 (Figure 28). The estimated median time between infection and diagnosis has decreased steadily since 2011 (Table 2).

Figure 28 HIV incidence among GBM at sexual health clinics in NSW, overall by year, 2007-2014

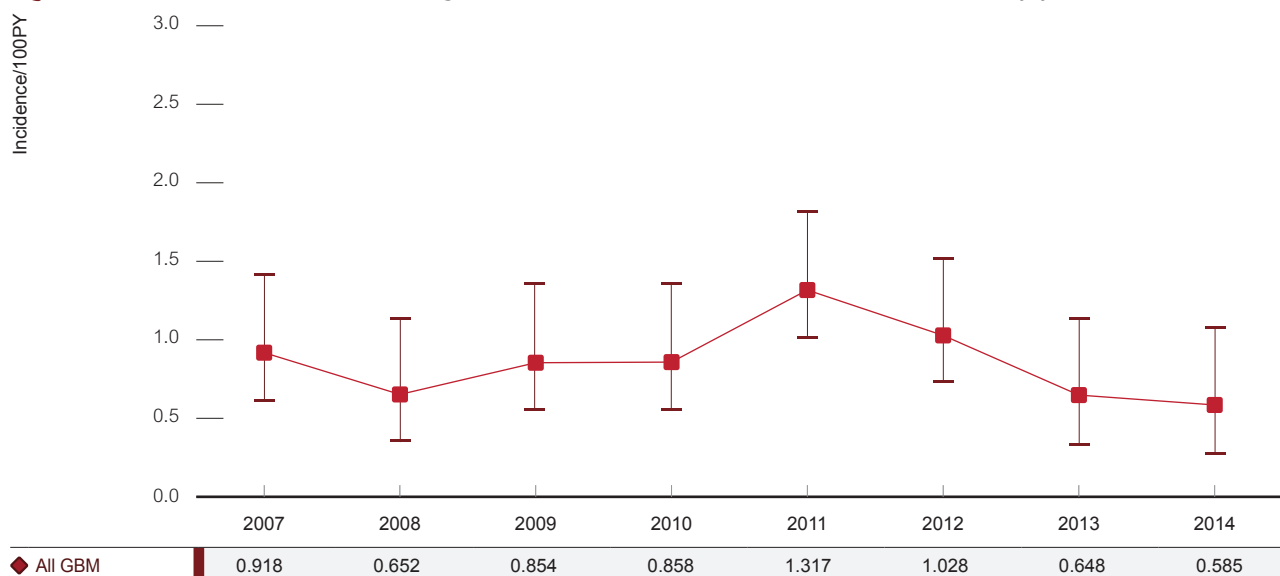
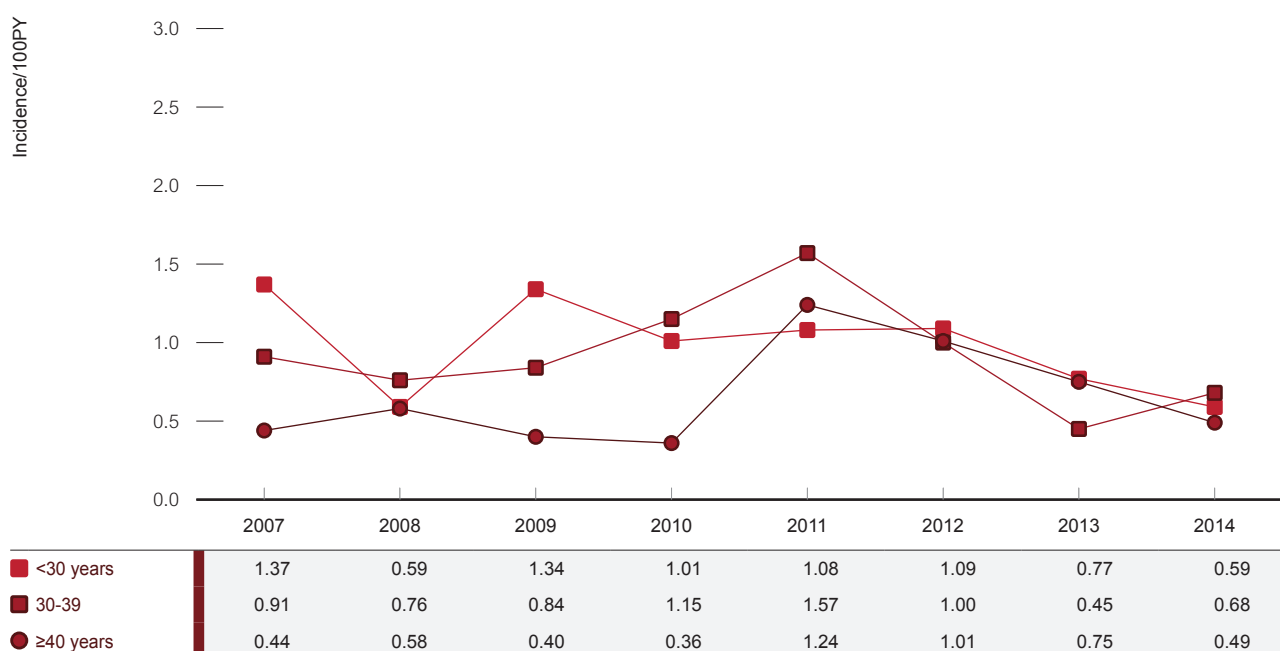


Table 2 Estimated median time from HIV infection to diagnosis among GBM at sexual health clinics in NSW, by year, 2007-2014

	2007	2008	2009	2010	2011	2012	2013	2014
Median time (days)	288	204	285	186	197	95	91	81

Figure 29 HIV incidence among GBM at sexual health clinics in NSW, by age group and year, 2007-2014

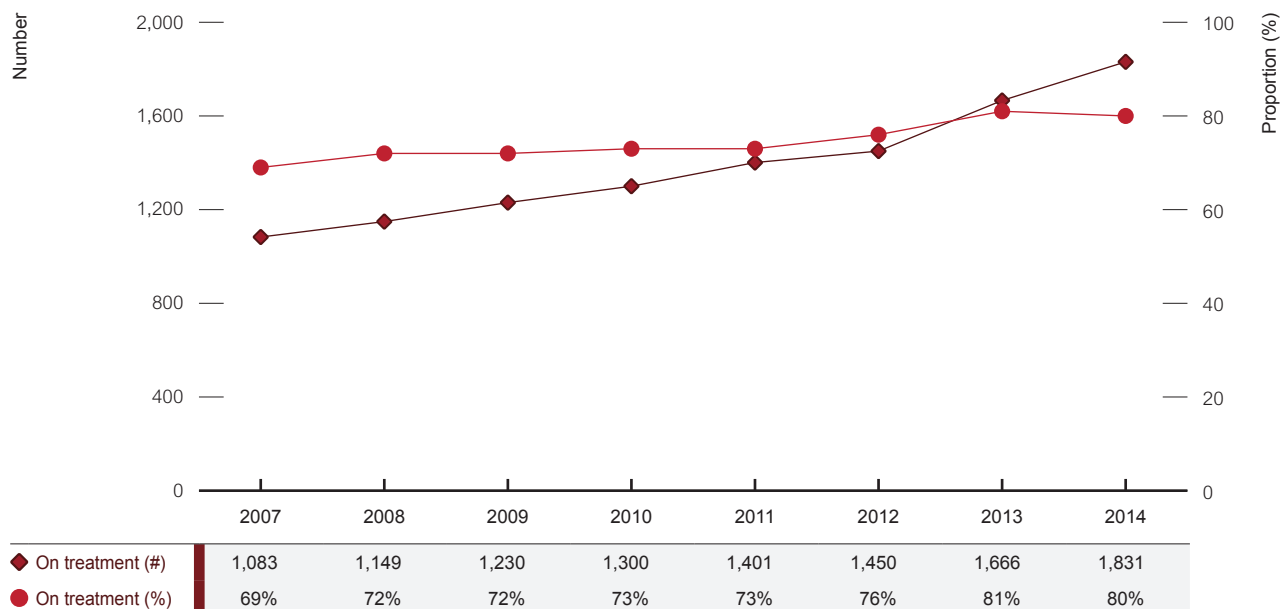


HIV positive patients on treatment

The following graphs present data from patients receiving antiretroviral treatment for HIV at sexual health clinics in NSW. Some patients may have received treatment from other health services.

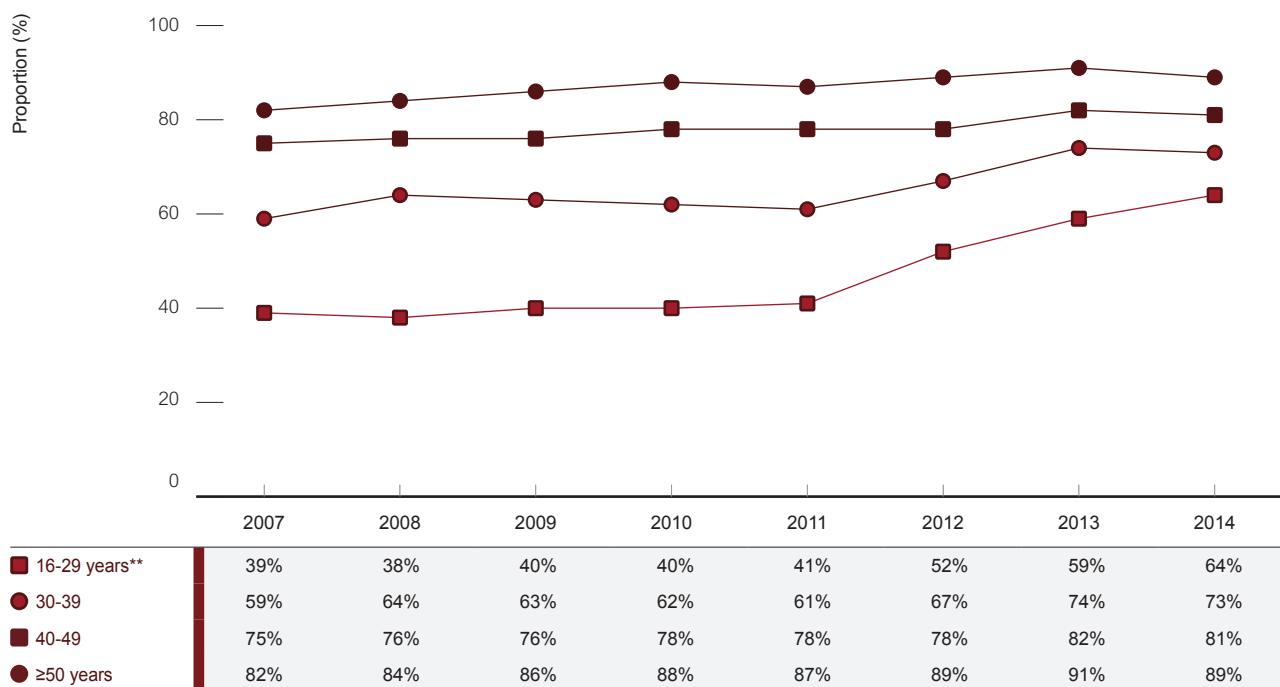
From 2007 to 2014 the number of patients receiving treatment for HIV increased by 69% (Figure 30) with the greatest increase among patients aged 16-29 years, rising 64% relatively from 2007 and 2014 (Figure 31).

Figure 30 Number and proportion of HIV positive patients on treatment* at sexual health clinics in NSW, overall by year, 2007-2014



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

Figure 31 Proportion of HIV positive patients on treatment* at sexual health clinics in NSW, by age group and year, 2007-2014



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

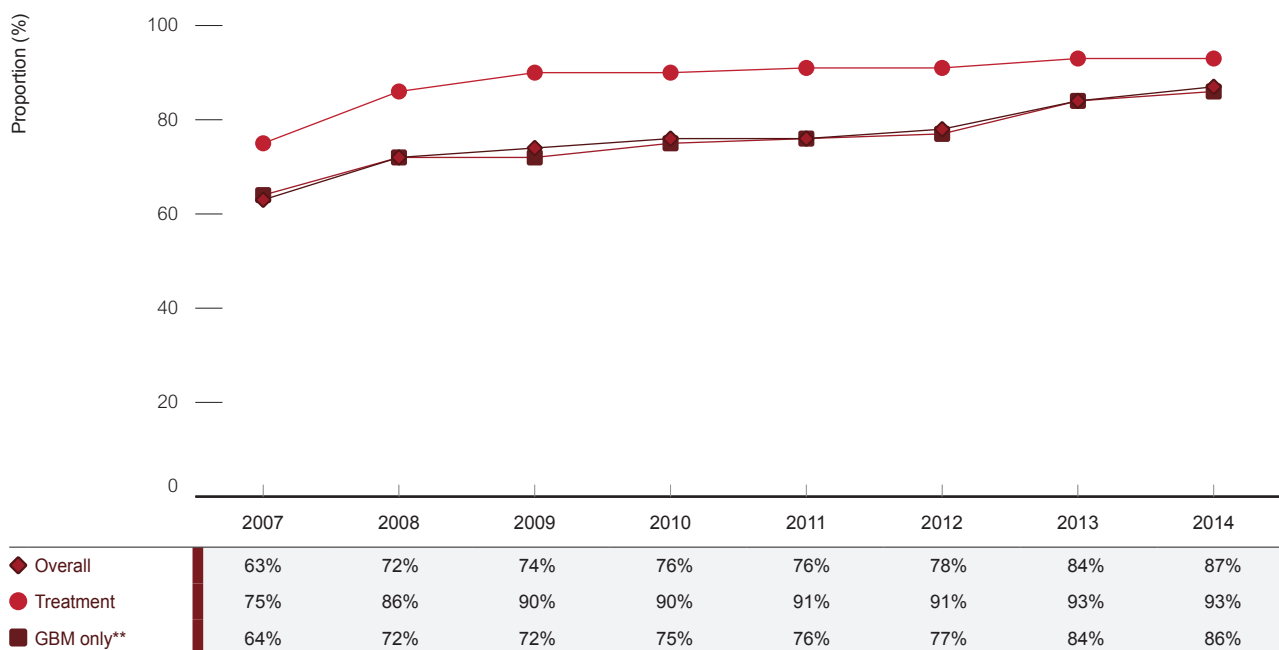
** Because of small numbers, patients aged 16-19 years have been grouped with patients aged 20-29 years

HIV viral load

The following section details viral load test results among patients with HIV and compares patients who received HIV treatment from the sexual health clinic 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. As noted, these figures do not account for patients who may have received treatment or management for HIV from other health services. Given that the proportion of patients with an undetectable viral load exceeds the proportion of patients recorded to be receiving treatment, it is possible that treatment coverage in this report is an underrepresentation.

Overall, the proportion of patients with 'undetectable' viral load results has risen steadily each year, increasing 38% between 2007 and 2014.

Figure 32 Proportion of HIV positive patients with undetectable viral loads (<400 RNA copies/mm³ of blood) seen at sexual health clinics in NSW, overall, among GBM, and by treatment status* and year, 2007-2014

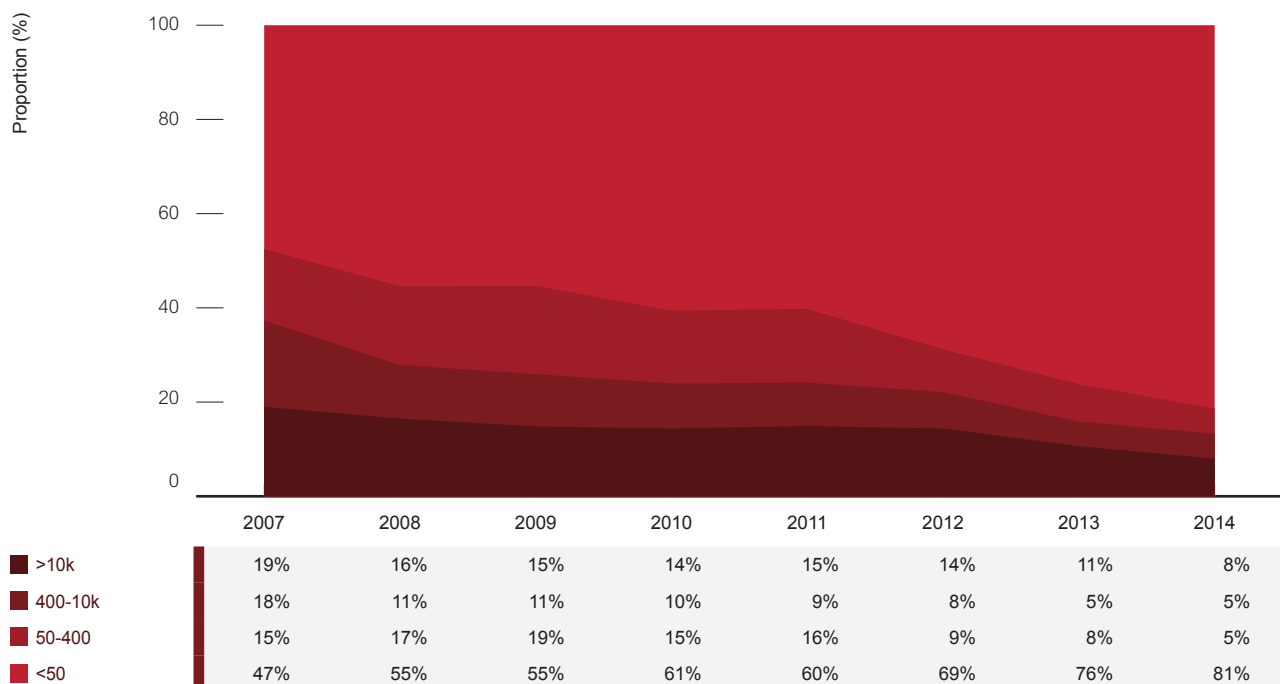


* Patients classified as 'on treatment' if history of prescriptions for antiretroviral medication recorded

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

The following graph stratifies each patient's last viral load test result of the year. The general trend of a proportional increase of patients achieving a viral load <50 RNA copies/mm³ of blood (which increased by 72% from 2007 to 2014) likely reflects increasing treatment uptake among patients living with HIV (see Figure 30). It may also reflect changing technologies of viral load testing, which have become considerably more precise over time, which would, in particular, explain the declining proportion of patients in the range of 50 – 400 RNA copies/mm³ of blood.

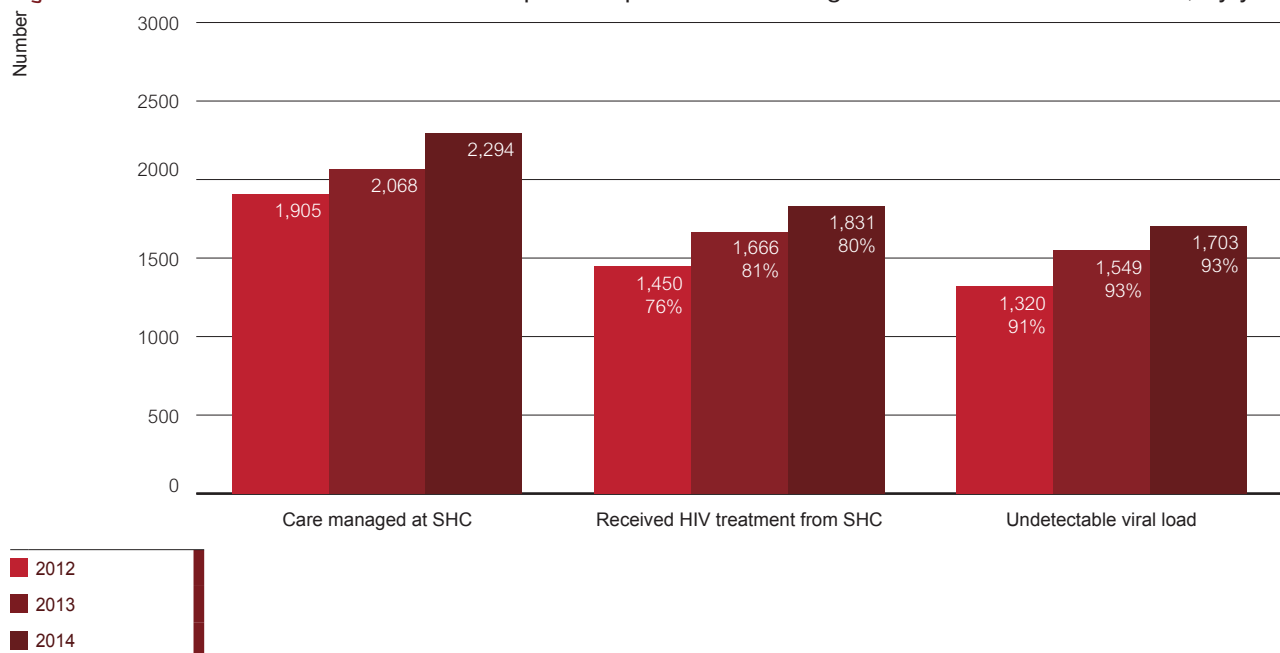
Figure 33 Proportion of HIV positive patients with viral loads* of <50, 50-<400, 400-10,000 and >10,000 at sexual health clinics in NSW, by year, 2007-2014



* Viral load values are presented as the number of RNA copies/mm³ of blood

The following graphs details the HIV 'care cascade' for HIV positive GBM patients attending NSW sexual health clinics in 2012 through 2014. 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 <400 RNA copies/mm³ of blood ('undetectable').

Figure 34 HIV 'care cascade' for HIV positive patients attending sexual health clinics in NSW, by year



High caseload general practice network

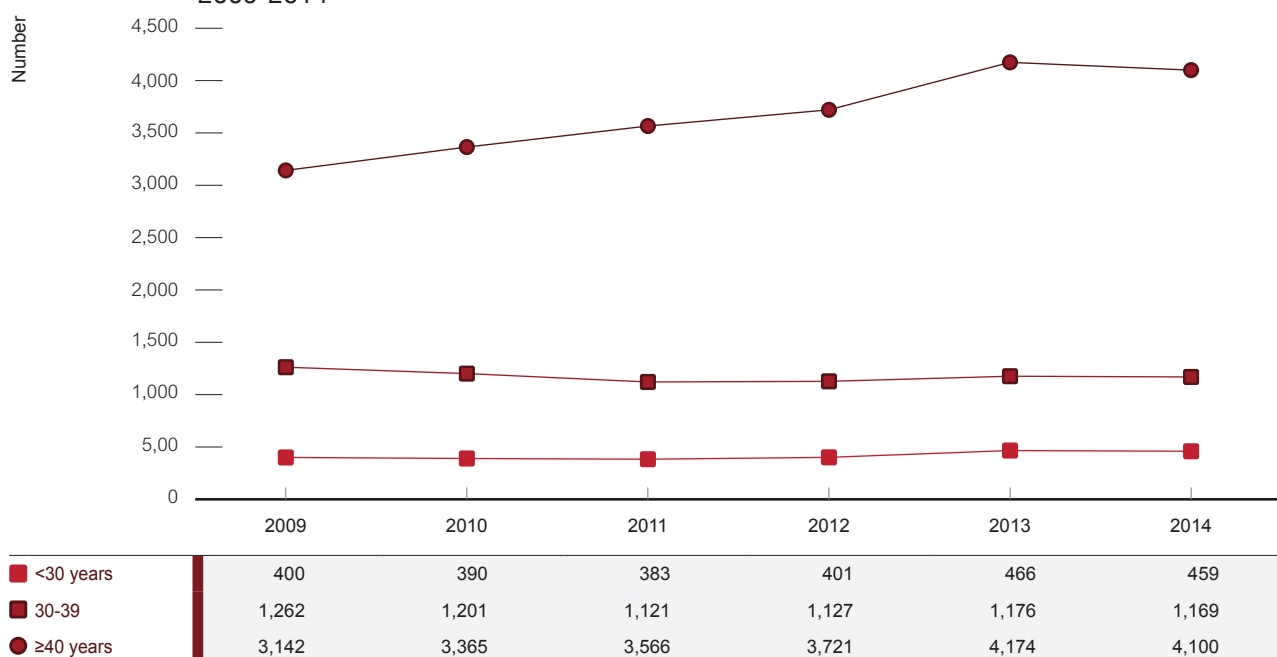
This section of the report collates data from three general practice (GP) clinics in NSW that see a high number of GBM patients ('high caseload GP'). All clinics are located in urban Sydney. These data were available from 2009 through 2014. Sexual orientation as recorded in the patient records was used to identify GBM.

Unique patients attending

These graphs represent the number of unique patients attending three participating high caseload GP clinics in NSW. Patients that attended multiple services were counted multiple times as unique patients were only identified within a clinic.

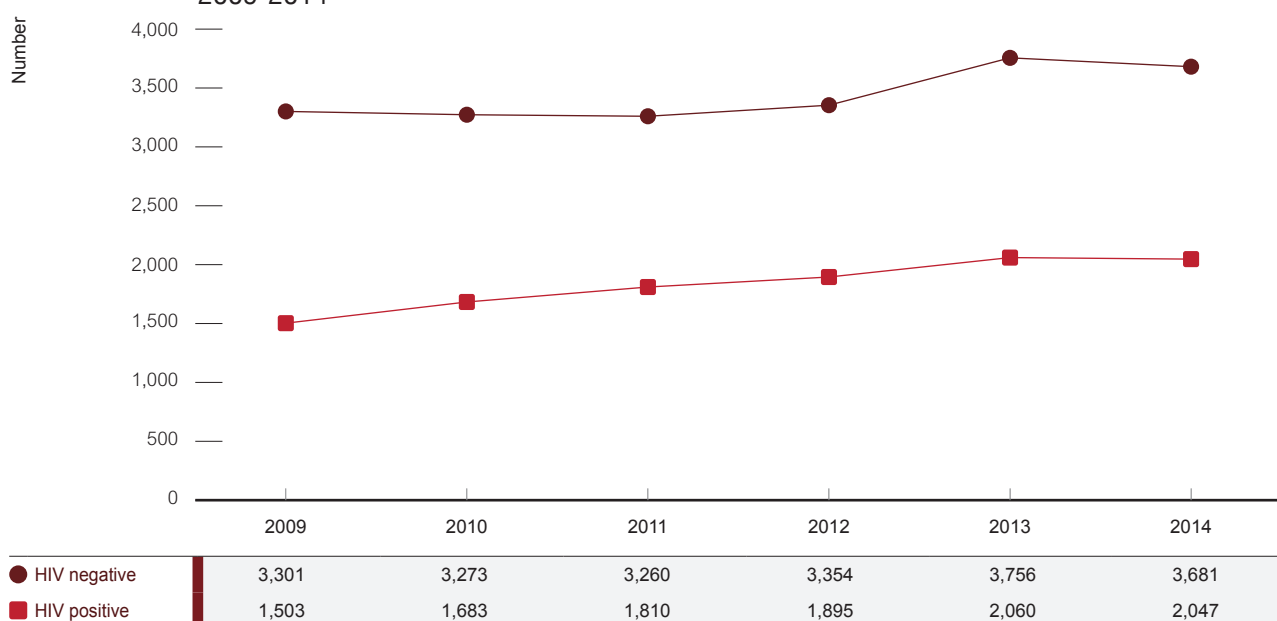
There was a 15% increase in the number of GBM patients seen at high caseload GP clinics from 2009 to 2014 with the largest increases among GBM aged 40 years and older (increase of 30%; Figure 35) and HIV positive men (increase of 36%; Figure 36). While 39% of GBM attending sexual health clinics in 2014 were less than 30 years old, this was true for only 8% at high caseload clinics (approximate rate of 5:1).

Figure 35 Number of unique GBM* seen at high caseload GP clinics in NSW, by age group and year, 2009-2014



* 'Unique' patients were only identified within each service

Figure 36 Number of unique GBM* seen at high caseload GP clinics in NSW, by HIV status and year, 2009-2014

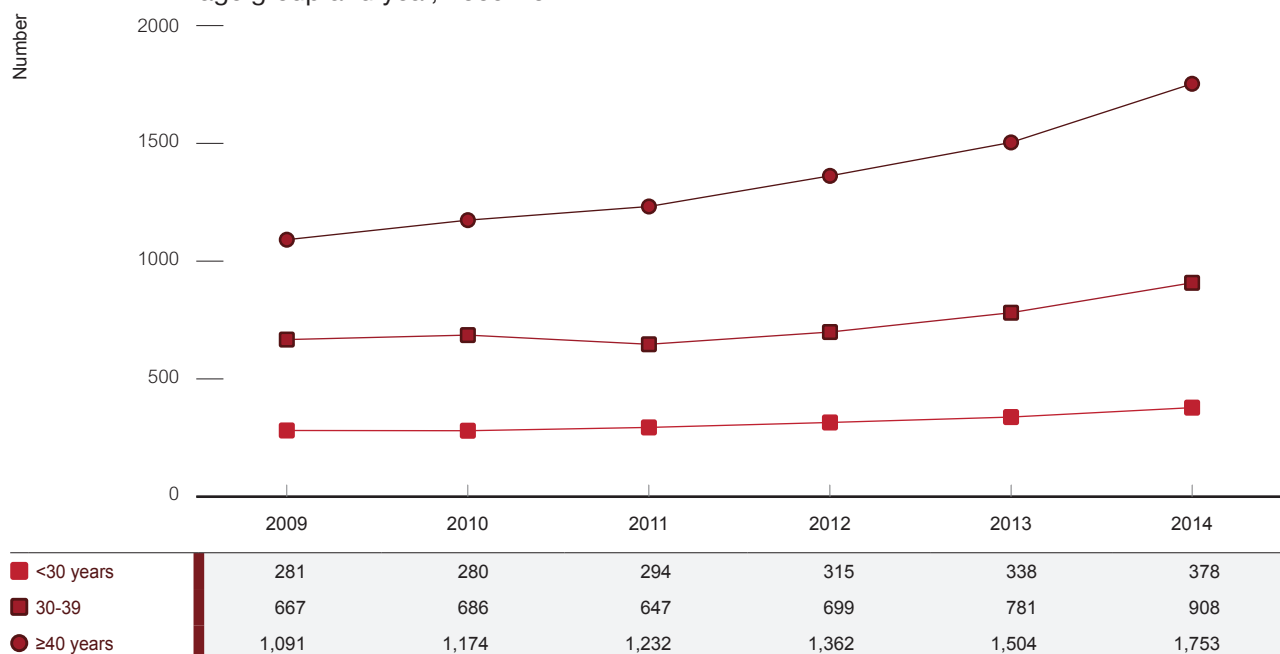


* 'Unique' patients were only identified within each service

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. Overall, the total number of tests among GBM attending high caseload GP clinics increased by 49% from 2009 to 2014 with the greatest increase (61%) among patients aged 40 years and older.

Figure 37 Total number of HIV tests in GBM patients seen at high caseload GP clinics in NSW, by age group and year, 2009-2014



Unique patients tested for HIV

This indicator accounts for repeat testing among individual patients by considering the number of patients tested each 12-month period instead of the total number of tests. The number of individuals tested increased by 35% from 2009 to 2014, particularly among GBM under 30 years old (37% increase).

Figure 38 Number of unique GBM* tested for HIV at high caseload GP clinics in NSW, overall and by age group and year, 2009-2014



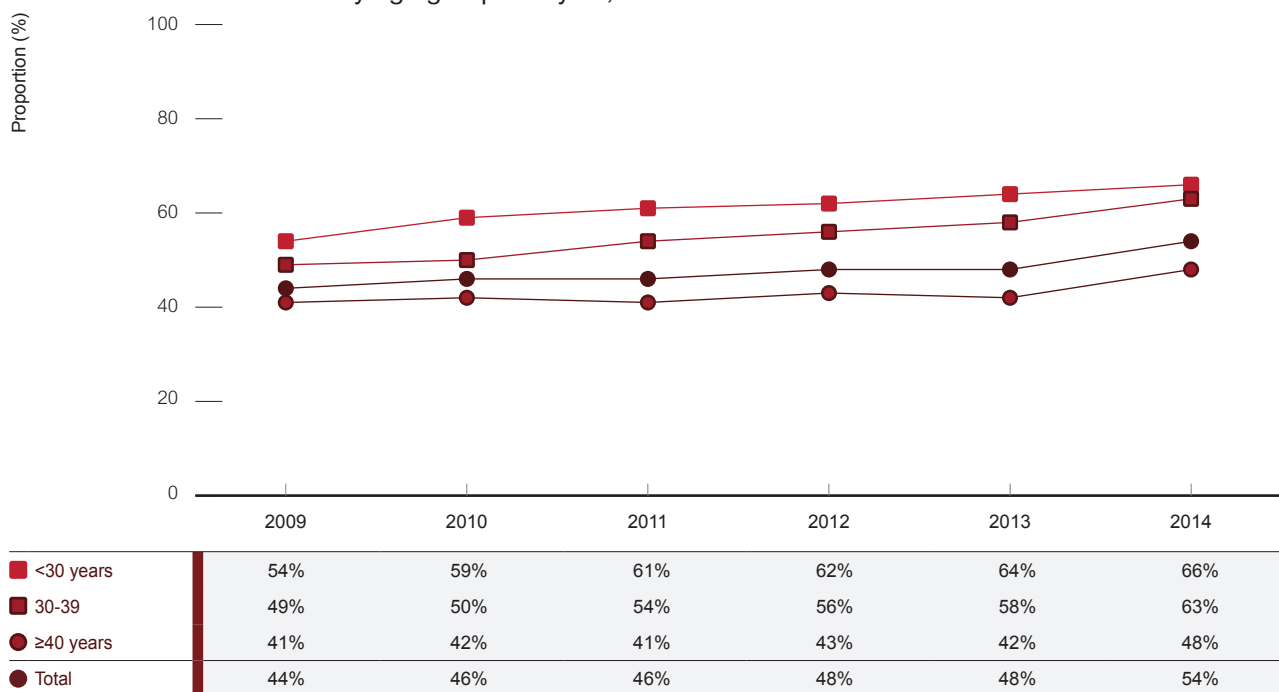
* 'Unique' patients were only identified within each service

Proportion tested for HIV (uptake)

The following graphs details the proportion of unique HIV negative patients who attended a participating high caseload GP clinics at least once in a 12-month period and received at least one HIV test. It is possible that some GBM may have been tested at another service.

From 2009 to 2014, the proportion of attending GBM tested for HIV increased (23% relative increase). The greatest increase was among patients aged 30-39 years old (29% relative increase).

Figure 39 Proportion of unique GBM patients* tested for HIV test at high caseload GP clinics in NSW, overall and by age group and year, 2009-2014

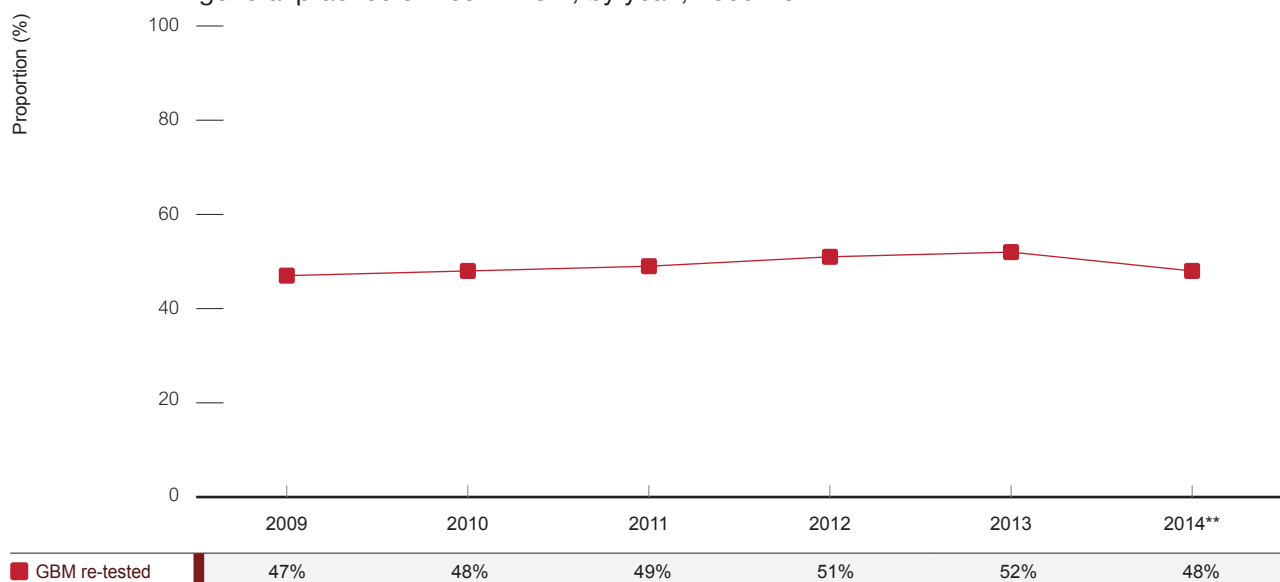


* Excluding (diagnosed) HIV positive individuals; 'Unique' patients were only identified within each service

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 GP clinics for whom an HIV test was followed by a subsequent HIV test within a year (plus one month grace 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. Overall, HIV re-testing among GBM remained stable. Data from 2014 are presented but given the 13-month timeframe it is likely 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.

Figure 40 Proportion of GBM re-tested within 13 months of an initial HIV test at high caseload general practice clinics in NSW, by year*, 2009-2014



* The year reflects the date of the initial test

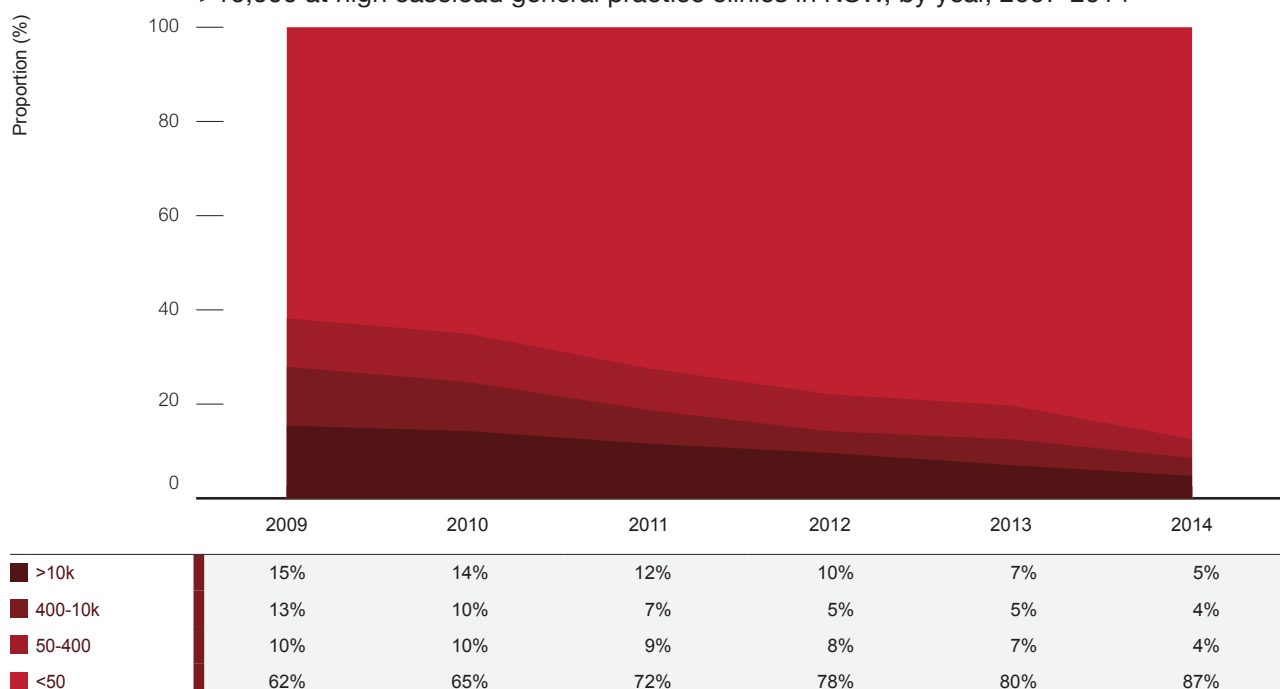
** For 2014: given the 13-month timeframe, it is possible that the proportion is an underestimate

HIV viral load

The following section details viral load test results among patients with HIV attending high caseload general practice clinics. As patients may have received more than one viral load test per year, the last test in each 12-month period was included.

Overall, the proportion of patients with 'undetectable' viral loads (<400 RNA copies/mm³ of blood) has increased significantly from 72% in 2009 to 91% in 2014 (26% increase). In sexual health clinics, 86% of patients with HIV had undetectable viral loads, a 5% difference.

Figure 41 Proportion of HIV positive patients with viral loads* of <50, 50-<400, 400-10,000 and >10,000 at high caseload general practice clinics in NSW, by year, 2007-2014



* Viral load values are presented as the number of RNA copies/mm³ of blood

General practice clinic network

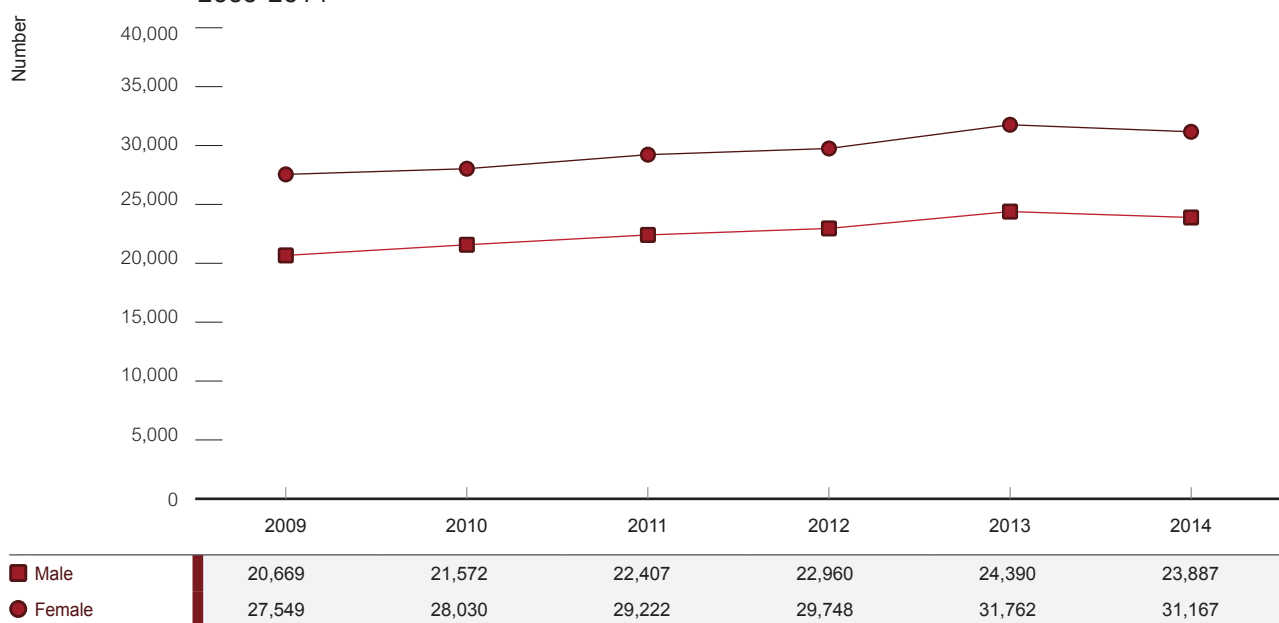
The General Practice Clinic Network includes 11 general practice clinics that do not see a high caseload of GBM. Data for these clinics are available from 2009. Clinics in this network are located primary in urban areas, although two are regionally-based.

Unique patients attending

These graphs represent the number of unique patients who attended 11 participating general practice clinics in NSW. Patients that attended multiple services were counted multiple times as unique patients were only identified within a clinic.

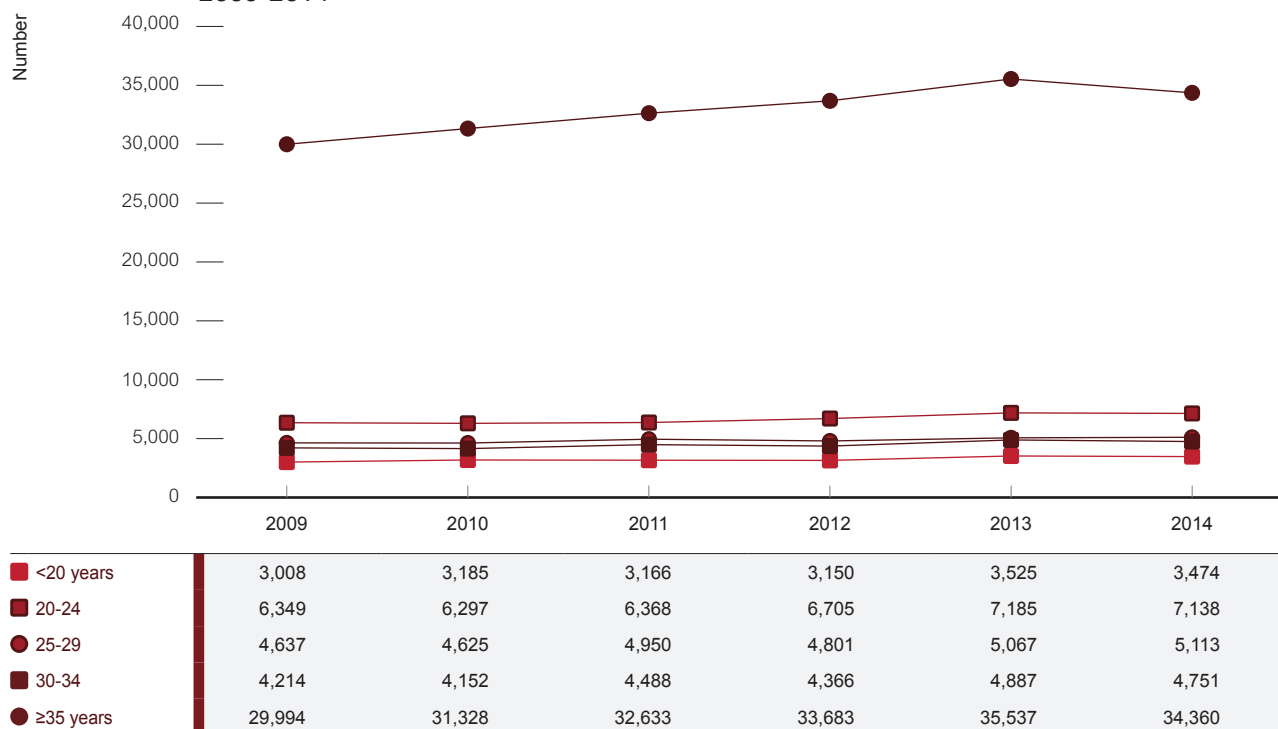
Between 2009 and 2014, the number of unique patients seen at general practice clinics increased 14%. A higher number of females compared to males were seen (Figure 42); the greatest increase in attendance between 2009 and 2014 was among patients aged under 20 years and those 35 years and older (15% increase each; Figure 43). In these services, 29% of attending patients were under 30 years old, which compares with 50% in sexual health services (approximate rate of 3:5).

Figure 42 Number of unique patients* seen at general practice clinics in NSW, by sex and year, 2009-2014



* 'Unique' patients were only identified within each service

Figure 43 Number of unique patients* seen at general practice clinics in NSW, by age group and year, 2009-2014



* 'Unique' patients were only identified within each service

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. At 11 general practice clinics, the total number of HIV tests conducted among male and female patients increased from 2009 to 2014 by 54% and 60%, respectively (Figure 44). In 2014, 64% of HIV testing in these services was among female patients, which likely reflects antenatal screening. The greatest change in HIV tests conducted was in patients aged 20-29 years (78% increase; Figure 45).

Figure 44 Total number of HIV tests in patients seen at general practice clinics in NSW, by sex and year, 2009-2014



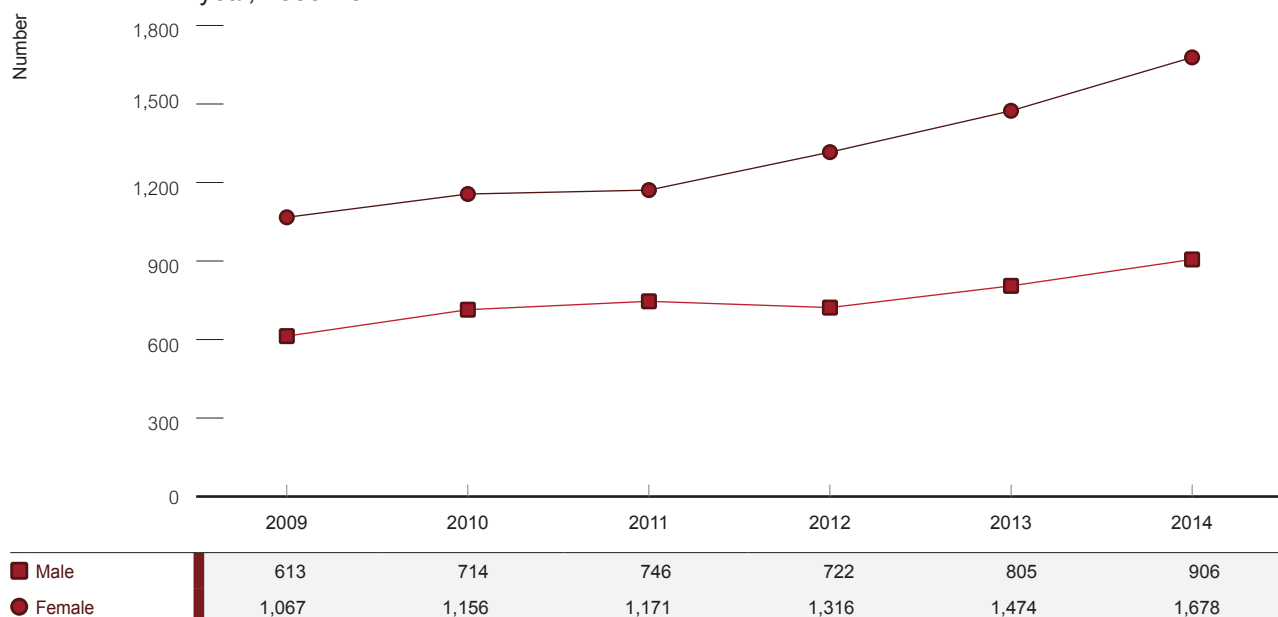
Figure 45 Total number of HIV tests in patients seen at general practice clinics in NSW, by age group and year, 2009-2014



Unique patients tested for HIV

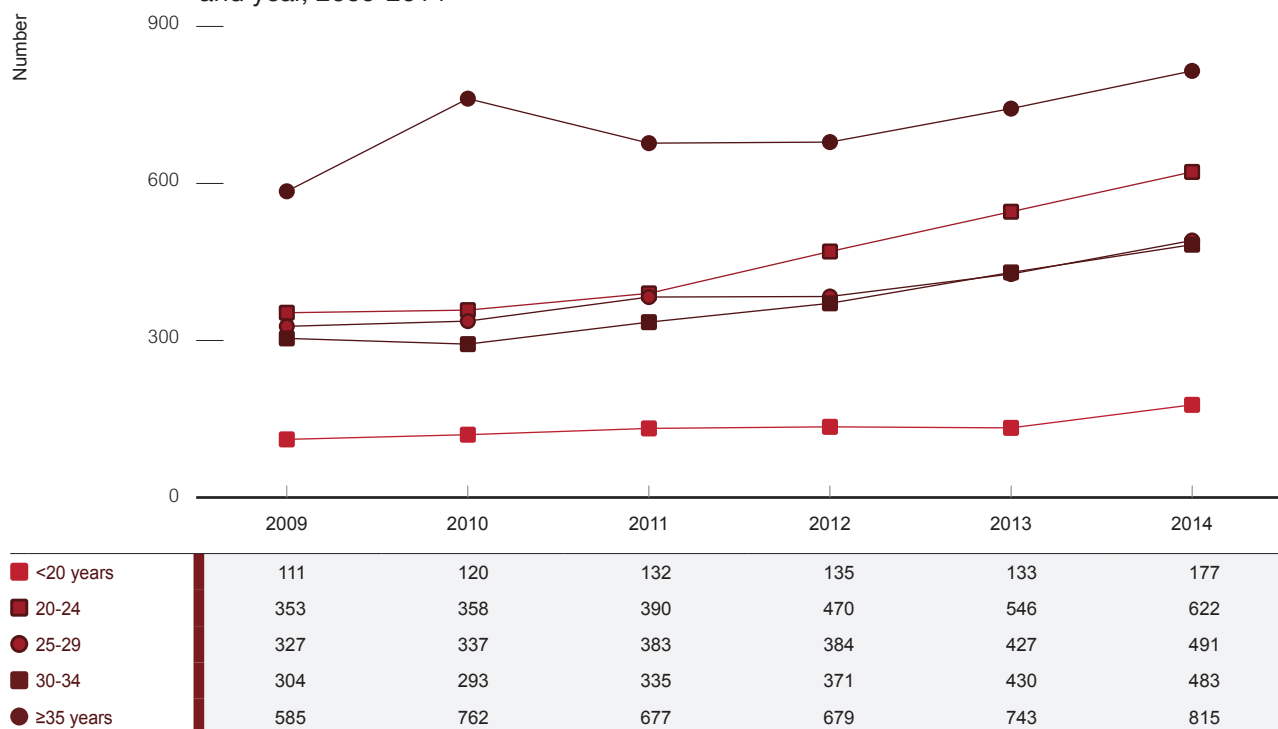
The following graphs report on the number of unique HIV negative patients who received at least one HIV test in a 12 month period. Overall, the number of individuals tested for HIV rose by 54% between 2009 and 2014 with the greatest increases observed among female patients (57% increase; Figure 46) and patients aged 20-29 years (76% increase; Figure 47).

Figure 46 Number of unique patients tested* for HIV at general practice clinics in NSW, by sex and year, 2009-2014



* 'Unique' patients were only identified within each service

Figure 47 Number of unique patients tested* for HIV at general practice clinics in NSW, by age group and year, 2009-2014



* 'Unique' patients were only identified within each service

Proportion tested for HIV (uptake)

This section details the proportion of unique patients who attended participating clinics at least once in a 12-month period, and received one or more tests for HIV ('test uptake'). Overall, testing uptake remained stable between 2009 and 2014 (Figure 48). By age, there was a 50% increase in the proportion of patients aged 20-29 years tested for HIV and a 43% increase for those aged 25-29 years and 30-34 years (Figure 49).

Figure 48 Proportion of patients with an HIV test at general practice clinics in NSW, by age group and year, 2009-2014

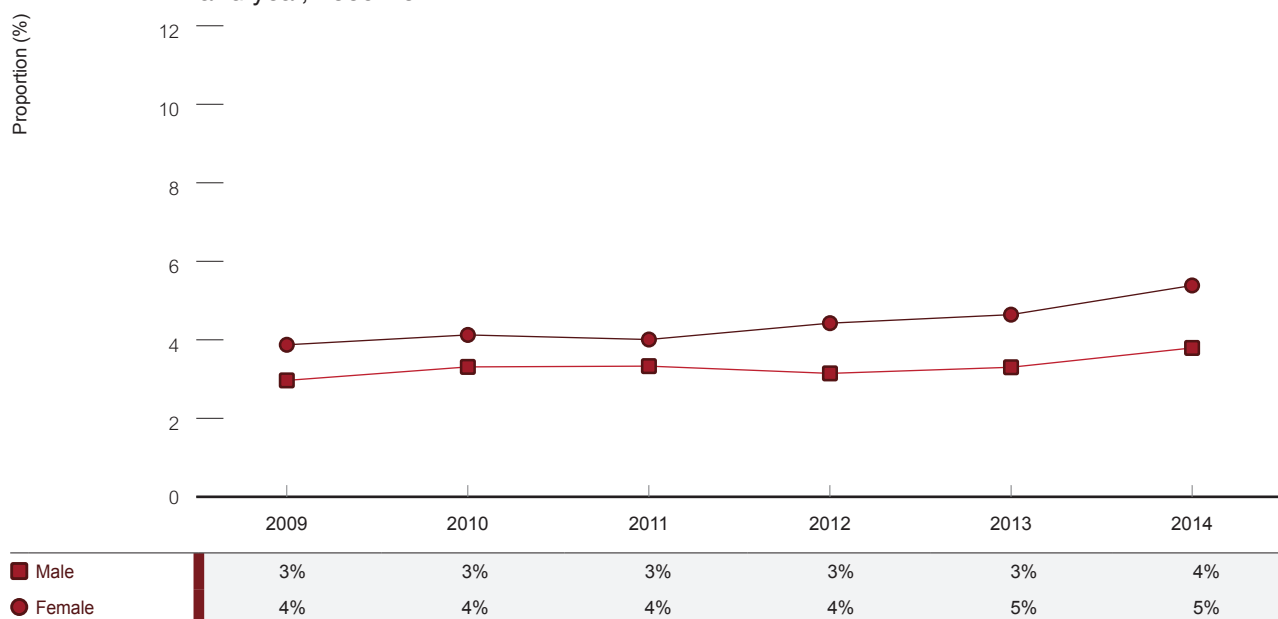
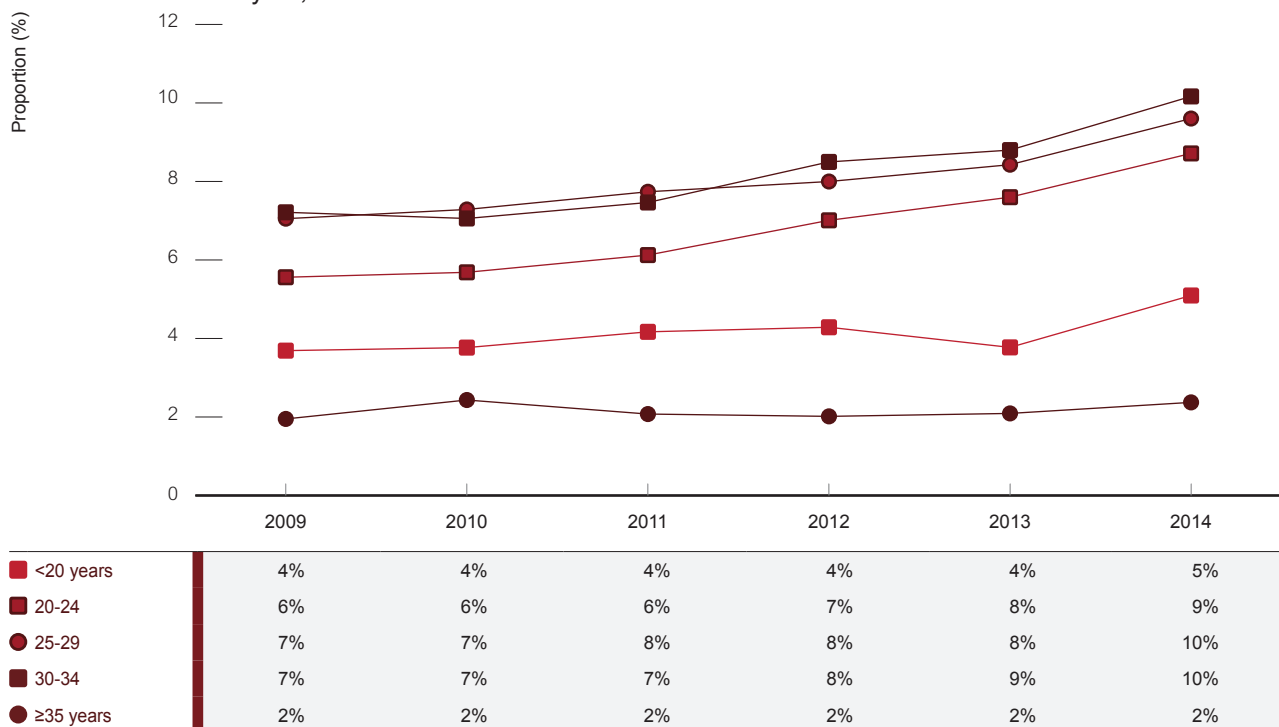


Figure 49

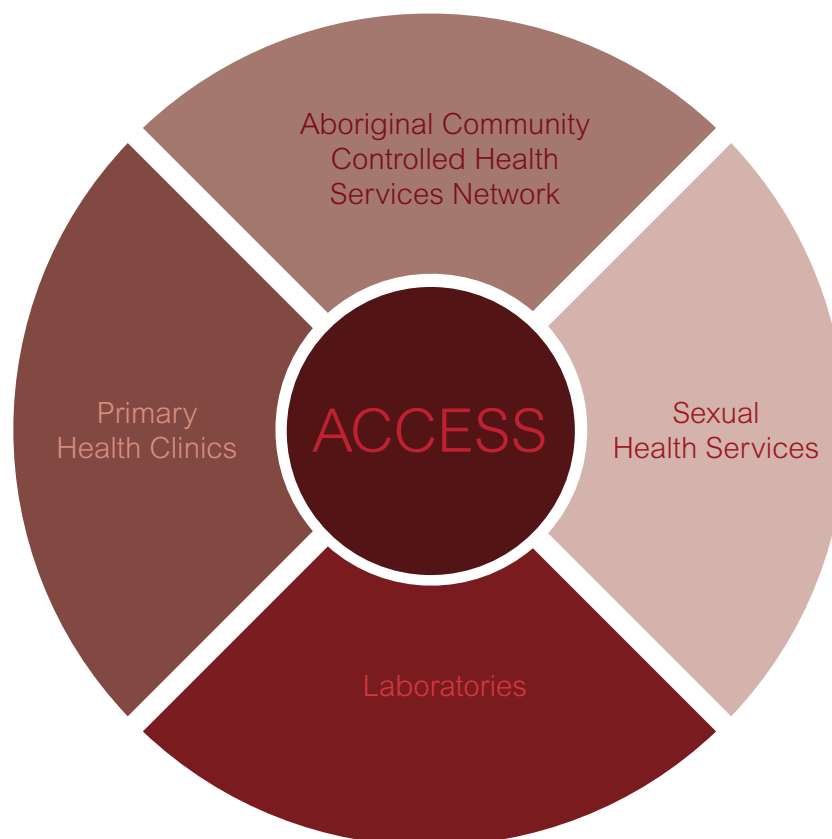
Proportion of patients with an HIV test at general practice clinics in NSW, by age group and year, 2009-2014



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 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, and 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.

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 indicator definitions

Indicator	Definition	Numerator	Denominator
HIV positivity <i>a) Non-unique positivity</i>	Proportion of HIV tests overall with associated diagnoses	Number of positive HIV tests/ HIV diagnoses	Number of HIV tests
HIV positivity <i>b) Unique positivity</i>	Proportion of unique (i.e., individual) patients with tested for HIV with an associated diagnosis	Number of unique patients tested for HIV with a positive result or HIV diagnosis	Number of unique patients tested for HIV
HIV incidence	Incident rate of HIV, based on repeat testing among individuals	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

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

