

# TRENDS

in HIV and HIV prevention indicators in gay, bisexual and other men who have sex with men in NSW, 2015-2019:

Implications for new interventions and for monitoring and evaluation in a new NSW HIV strategy

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**AUTHORS:**

Andrew E. Grulich, Steven J. Nigro, Curtis Chan, Prital Patel, Benjamin R. Bavinton, Martin Holt, Garrett Prestage, Denton Callander, Carolyn Murray, Cherie Power, Angie Pinto, Limin Mao, Tim Broady, and Phillip Keen on behalf of the NSW HIV Prevention Partnership Project.

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## **Trends in HIV and HIV prevention indicators in gay, bisexual and other men who have sex with men in NSW, 2015-2019: implications for new interventions and for monitoring and evaluation in a new NSW HIV strategy.**

Andrew E. Grulich<sup>1</sup>, Steven J. Nigro<sup>2</sup>, Curtis Chan<sup>1</sup>, Prital Patel<sup>1</sup>, Benjamin R. Bavinton<sup>1</sup>, Martin Holt<sup>3</sup>, Garrett Prestage<sup>1</sup>, Denton Callander<sup>4,1</sup>, Carolyn Murray<sup>2</sup>, Cherie Power<sup>2</sup>, Angie Pinto<sup>1</sup>, Limin Mao<sup>3</sup>, Tim Broady<sup>3</sup>, and Phillip Keen<sup>1</sup> on behalf of the NSW HIV Prevention Partnership Project\*.

<sup>1</sup>Kirby Institute, UNSW Sydney, Sydney, Australia.

<sup>2</sup>NSW Ministry of Health, Sydney, Australia.

<sup>3</sup>The Centre for Social Research in Health, UNSW Sydney, Sydney, Australia.

<sup>4</sup>Mailman School of Public Health, Columbia University, New York NY

\*The investigators on the NSW HIV Prevention Partnership Project Study are Professor Andrew E. Grulich, Dr Christine Selvey, Professor Rebecca Guy, Associate Professor Garrett Prestage, Associate Professor Iryna Zablotska, Ms Jo Holden, Mr Tim Duck, Mr Craig Cooper, Ms Karen Price, Professor Martin Holt, Professor John de Wit, Professor John Kaldor, Professor Anthony Kelleher, and Professor David Wilson. The late Mr Alan Brotherton, the late Professor David A. Cooper, and the late Adjunct Associate Professor Levinia Crooks were also investigators on the grant. The project steering committee included these investigators and Mr Bill Whittaker, Mr Phillip Keen, Dr Denton Callander, Mr Daniel Madeddu, Dr Heather-Marie Schmidt, Ms Barbara Telfer, Ms Karen Price, Dr Mark Boyd, Dr Benjamin R. Bavinton, Mr Scott McGill, Dr Prital Patel, Ms Cherie Power, Dr Angie Pinto, Dr Steven J. Nigro, Mr Neil Fraser, Ms Tina Gordon, Ms Carolyn Murray, Ms Jane Costello, and Mr Lance Feeney.

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### **Kirby Institute**

Wallace Wurth Building

UNSW Sydney, NSW, 2052

T: +61 (2) 9385 0900 | F: +61 (2) 9385 0920

E: [recpt@kirby.unsw.edu.au](mailto:recpt@kirby.unsw.edu.au) | W: [kirby.unsw.edu.au](http://kirby.unsw.edu.au)

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# Executive Summary



This report provides a detailed overview of trends in HIV diagnoses and HIV prevention indicators in gay, bisexual and other men who have sex with men (GBMSM) during the NSW HIV Strategy 2016-2020, with analyses based on data available to end 2019. The report evolved from a summary of the annual scientific meeting of the NSW HIV Prevention Partnership Project (the NHPPP), funded by the National Health and Medical Research Council (NHMRC), NSW Health and UNSW Sydney for the years 2015-19, and extended to 2020. The NHPPP is co-led by the Kirby Institute and the NSW Ministry of Health, and includes partners ACON, ASHM, the Centre for Social Research in Health, and Positive Life NSW.

The purpose of this report is to provide an understanding of current trends in HIV in GBMSM in NSW, and to suggest new directions for prevention initiatives in the context of ongoing work by the Ministry to develop a new 5-year HIV strategy. The NSW HIV Strategy 2016-2020 had a highly ambitious goal “to virtually eliminate HIV transmission in NSW by 2020”. This report highlights enormous progress towards this goal, such that in some sub-populations the goal of virtual elimination is in reach. In addition, it highlights populations where increased focus is required.

**Overseas-born GBMSM** require an increased focus on HIV prevention, and strategies to encourage HIV testing and the earlier diagnosis of HIV among those recently arrived in Australia. Although the incidence of new HIV infection appears to be decreasing in this population, late HIV diagnoses that were probably acquired overseas before coming to Australia have increased substantially over the past 5 years. Addressing this issue requires prompt linkage to HIV testing, treatment, and care on arrival in Australia. For those of these men who are gay, linkage to gay community is likely to be important in HIV prevention. In existing clinic-based and gay community-based data sets, levels of HIV testing, treatment, and the use of pre-exposure prophylaxis (PrEP) by overseas-born GBMSM appear high. Additional surveillance is needed to deepen our understanding of access to testing and PrEP by overseas-born GBMSM.

**GBMSM who reside outside of the central Sydney ‘gay suburbs’** require increased HIV prevention focus. Remarkable success has been demonstrated in the central Sydney suburbs where more than 20% of men are estimated to be gay, and a 70% decline in recently acquired infections has been documented. Late HIV diagnoses are now extremely uncommon in the central Sydney gay suburbs. However, late diagnoses have increased elsewhere, and this increase is driven by the increase in late diagnoses in recently arrived overseas-born GBMSM noted above. HIV testing rates are slightly higher in GBMSM in the central Sydney gay suburbs, but levels of HIV treatment among HIV-positive GBMSM are equally high across all these areas. PrEP use among high-risk GBMSM is substantially lower among those who reside outside the central Sydney gay suburbs. This lower uptake of PrEP likely underlies the much lesser declines in HIV incidence seen outside the central Sydney gay suburbs. The challenge for the next HIV strategy is to maintain and extend the success seen in the central Sydney gay suburbs.

**Young GBMSM aged under 25 years** require increased HIV prevention focus. There were declines of 38-67% in early HIV infection in age groups of GBMSM aged older than 25, but only a 6% decline in MSM aged under 25. GBMSM aged less than 25 are much less likely to live in the central Sydney gay postcodes and are less likely to be highly socially engaged with gay men. They have slightly lower HIV testing rates than those aged 25-44, and they have substantially lower PrEP uptake, even among those likely at high risk. Linking young GBMSM to HIV prevention services soon after they commence sexual activity should be an important priority in the new HIV strategy.

HIV infection in **GBMSM who do not identify as gay** requires further research and surveillance. The very limited availability of surveillance data about this subpopulation means that making firm conclusions about the HIV prevention needs of this

group is difficult. These men are less socially connected to gay men, and this is likely to mean that they are less well connected to innovations in prevention. A lower proportion of high-risk non gay-identified men take PrEP, and a higher proportion report condomless anal intercourse with casual partners that is not protected by PrEP.

The focus of this report on challenges in certain sub-populations should not distract from the **extraordinary successes in HIV prevention that we have documented in GBMSM over the past 5 years**. In the population with the greatest reduction in HIV – Australian-born GBMSM living in the central Sydney gay suburbs – we documented a 75% reduction in the incidence of new HIV infection during this period. Late diagnoses are now almost entirely absent in this group. New infections are also decreasing in the overseas-born GBMSM.

A new HIV strategy for further reducing HIV in GBMSM in NSW will require continued focus on areas of success and extra targeting towards the overseas-born, those living outside the gay suburbs of Sydney, those aged less than 25, in non-gay-identifying GBMSM and in GBMSM with various intersections of these characteristics.

# 1.

## Background and purpose of this document

---

Monitoring and evaluation of ongoing HIV policy in NSW has been supported by an NHMRC Partnership grant since 2015. The lead partners have been the Kirby Institute and the NSW Ministry of Health, with high-level ongoing input from other named partners including ACON, ASHM, the Centre for Social Research in Health, and Positive Life NSW. The NSW HIV Prevention Partnership Project (NHPPP) has held an annual scientific meeting since 2015. The 2019 meeting was held at the Kirby Institute on 5th December. The meeting was structured around trends in HIV in gay, bisexual and other men who have sex with men (GBMSM) disaggregated by country of birth, age, residing in “gay suburbs” compared to elsewhere, and by sexual identity.

The main focus of analysis was on 3 sources of data which have been consistently available over the last 5 years, namely:

1. HIV surveillance data. For surveillance data only, we have used the term “men who have sex with men” (MSM). These data are collected in the NSW Notifiable Conditions Information Management System. HIV exposure risk (i.e. a male having sex with another male) is reported with HIV notifications, however sexual identity is not collected. We examined these data separately for all new HIV diagnoses, diagnoses with evidence of “early stage” infection, as an indicator of trends in HIV incidence, and diagnoses with evidence of late HIV diagnosis) (1). Note that HIV diagnoses among transgender people are included in the broader MSM exposure category due to current limitations in data collection and overall exposure classification. NSW is progressing work to update how gender is collected and recorded for new HIV diagnoses. A national review of exposure classification for HIV surveillance is also ongoing;
2. the Sydney Gay Community Periodic Surveys (Sydney GCPS) (2); and
3. the ACCESS network data (3). Data from the ACCESS network is derived from approximately 19 sexual health clinics (SHCs) and four high case load private general (GP) practice clinics in NSW.

Within each of these data sources, the key prevention pillars of HIV testing, HIV treatment and PrEP use were examined. Behavioural risk data from the Sydney GCPS, although not a major focus at the annual meeting, have been incorporated into analyses. The meeting structure represented a new approach to considering trends in HIV diagnoses in NSW.

In the context of 2020 being the final year of the NSW HIV strategy 2016-2020, the purpose of this document is to:

1. Summarise trends in new HIV diagnoses, HIV testing, HIV treatment and PrEP in GBMSM, by the groupings considered (for the years 2015-19 unless otherwise specified);
2. Consider implications for new interventions to reduce HIV transmission in GBMSM; and
3. Consider implications for monitoring and evaluation strategies and data sources.

Since the meeting the data presented were updated to include data from the full year of 2019, and by the addition of data on risk behaviour. Given the focus of the report, particular attention has been paid to comparison between 2015, the last full year before the current NSW HIV Strategy, and 2019. In the HIV notifications graphs, data for selected earlier years are given for context.

Surveillance data were considered for all HIV diagnoses and were also presented by stage of infection. Broadly, early-stage infections (i.e. with evidence of infection in the last 12 months) likely reflect trends in incidence, whereas late stage diagnoses (CD4 < 350 at diagnosis) likely reflect infections occurring more than 4 years ago. Where data are presented for all HIV diagnoses these obviously contain a mix of these two categories, plus diagnoses diagnosed at an intermediate stage between “early” and “late”.

In interpreting these data, overall surveillance trends in HIV diagnoses in MSM, as published in the *NSW HIV Strategy 2016 – 2020 Quarter 4 & Annual 2019 Data Report* should be noted. Between 2015 and 2019, there was a 25% reduction in HIV diagnoses in GBMSM in NSW. The decline was far greater in diagnoses with evidence of early stage infection (40% decline) than in new diagnoses with evidence of late diagnosis (4% decline).

Where data among GBMSM are stratified by 'high risk', for Sydney GCPS data high risk is defined as reporting condomless anal intercourse with casual partners in the previous six months. For ACCESS data high risk is assigned to men who had a history of a rectal STI in the 24 months prior, or over the past 12 months evidence of inconsistent condom use, 20 or more partners, or evidence of injecting drug use.

Where area of residence in this report is categorised as 'non-gay suburbs' and 'gay suburbs', non-gay suburbs refers to postcodes where <5% of adult males were estimated to be gay, and gay suburbs refers to postcodes where >5% of adult males were estimated to be gay, using the method developed by Callander et al. (2020) (4).

# 2.

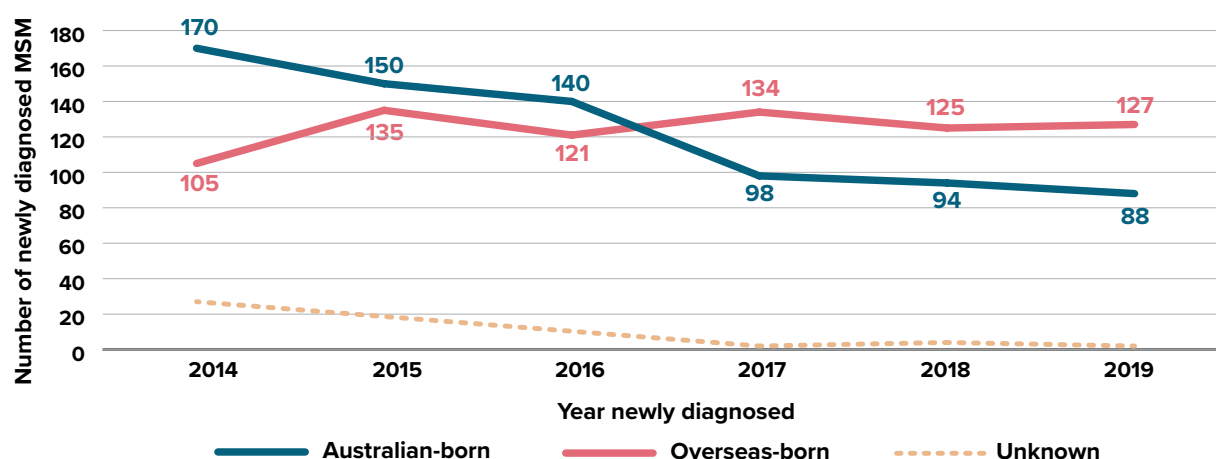
## Trends in HIV

in gay, bisexual and other men who have sex with men by country of birth

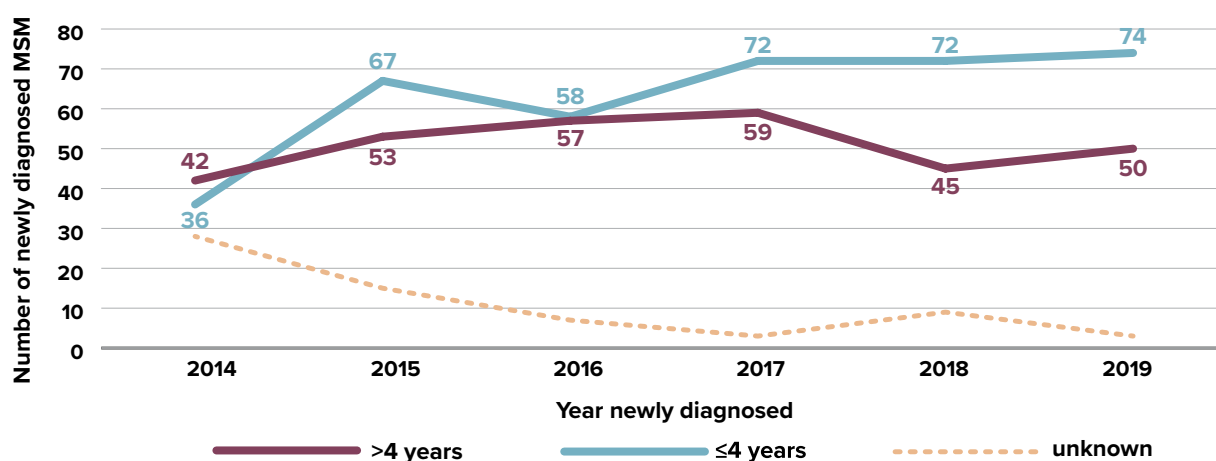
### A. Surveillance of HIV diagnoses by country of birth

**Trends in all HIV diagnoses:** Between 2015 and 2019, HIV diagnoses declined by 41% in Australian-born MSM but by only 5.9% in the overseas-born (Figure 1). In 2015, 53% of those with a known country of birth were Australian-born, and this declined to 41% in 2019. Since 2017, Australian born MSM have represented a minority of new diagnoses in MSM. In the overseas-born, there were increases in HIV diagnoses in those who have lived in Australia for 4 years or less (increase of 10%) and little change in others (decrease of 5.7%, Figure 2).

**Figure 1. All new HIV diagnoses in MSM for Australian-born and overseas-born men**

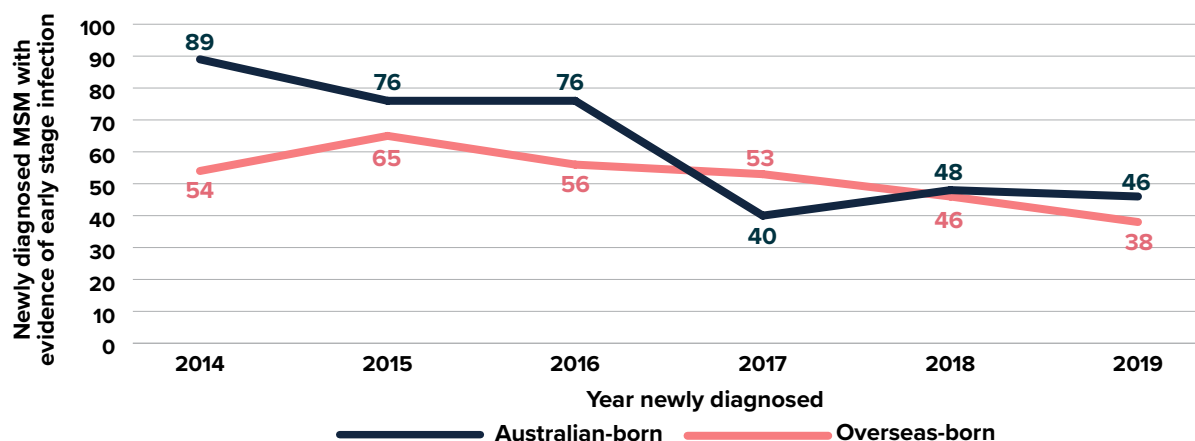


**Figure 2. All new HIV diagnoses in overseas-born MSM, by years living in Australia**

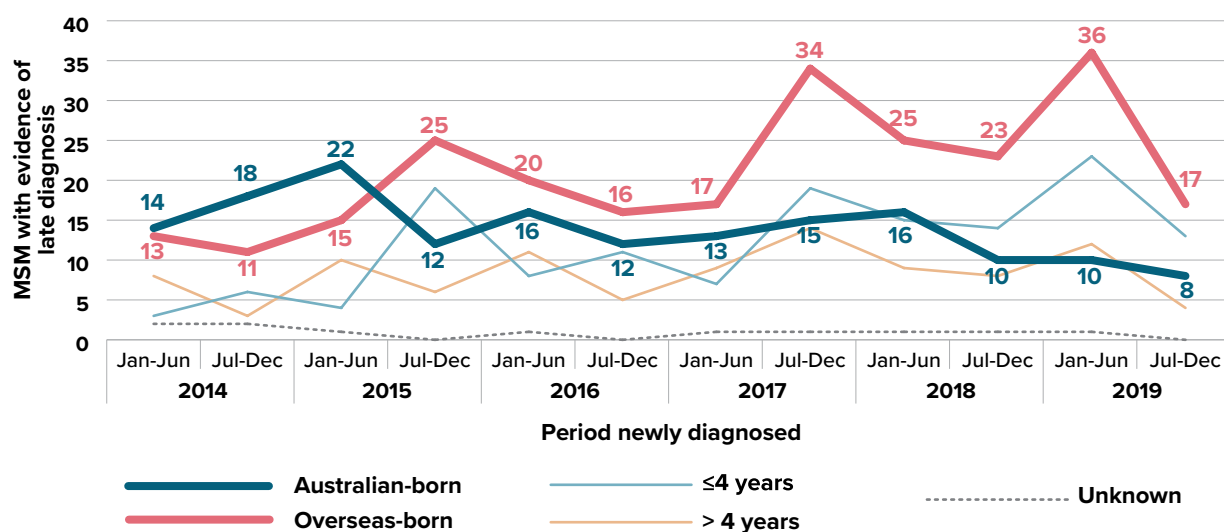


**Trends in HIV diagnoses with evidence of early stage infection:** Between 2015 and 2019, early stage HIV infections declined in both Australian-born (39%) and overseas-born MSM (by 42%, Figure 3). Among overseas-born MSM, there was a decline of 38% among those who have lived in Australia for 4 years or less and a decline of 28% in those who had lived in Australia for 4 or more years (Figure 4).

**Figure 3. Newly diagnosed MSM with evidence of early stage infection for Australian-born and overseas-born men**

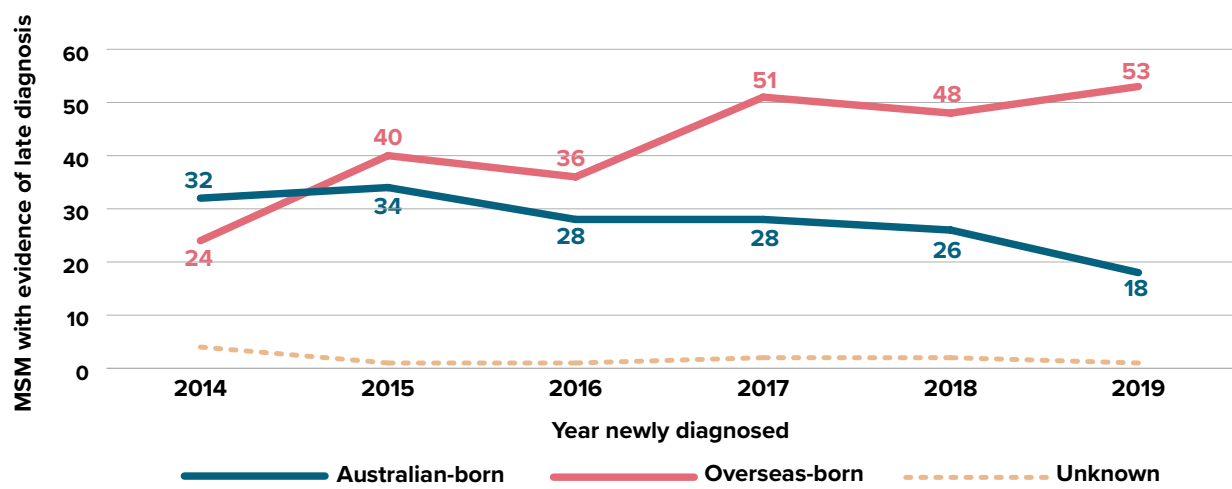


**Figure 4. Newly diagnosed MSM with evidence of late stage infection for Australian-born and overseas-born men, by years living in Australia among overseas-born men**

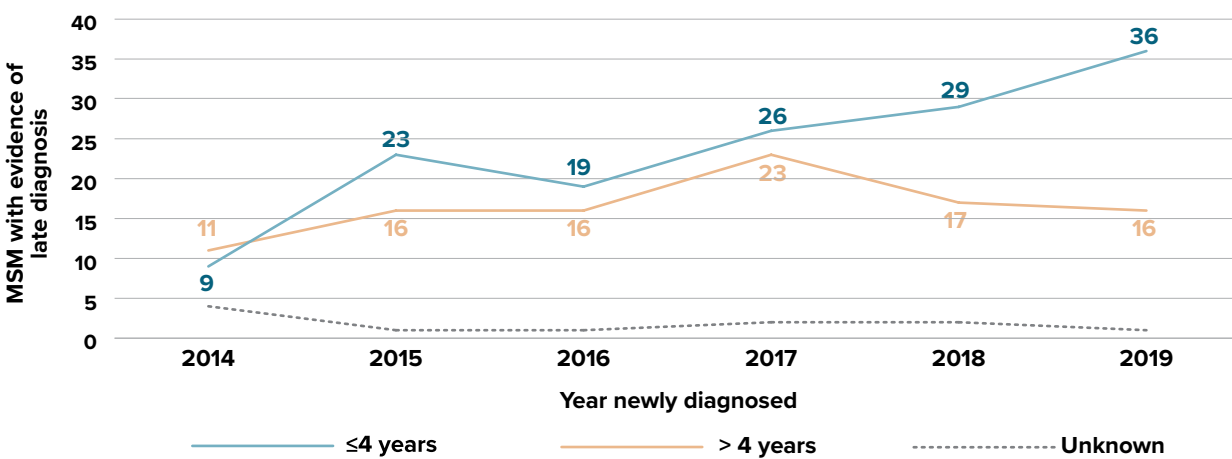


**HIV diagnoses with evidence of late diagnosis:** Between 2015 and 2019, among MSM diagnosed with evidence of late diagnosis, there was a substantial decline in the Australian-born (47%), but in complete contrast, there was a 32% increase in the overseas-born (Figure 5). The increase in late diagnoses in the overseas-born was driven by increases in those living in Australia for 4 years or less, in whom diagnoses increased 57%. There was little or no change in late diagnoses in those resident for 5 or more years (Figure 6).

**Figure 5. Newly diagnosed MSM with evidence of late diagnosis for Australian-born and overseas-born men**



**Figure 6. Newly diagnosed MSM with evidence of late diagnosis in overseas-born men by years living in Australia**



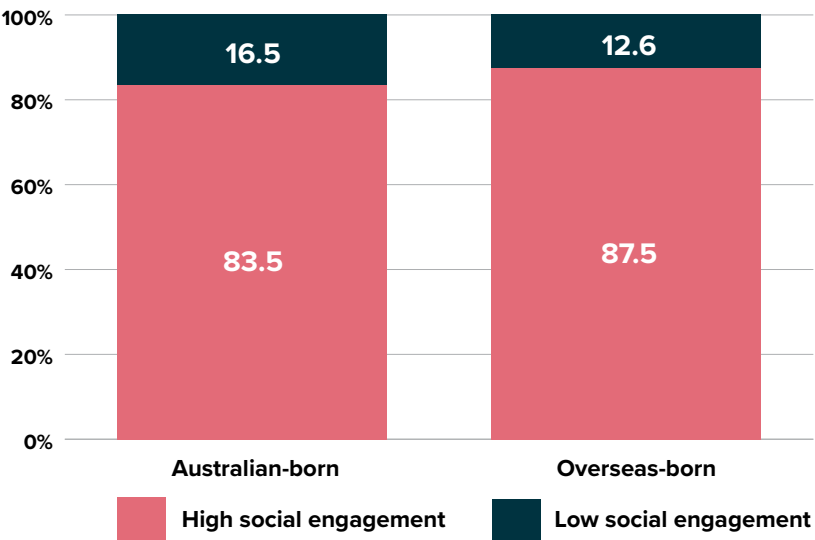
In summary, the different pattern of HIV diagnoses by country of birth appears to be driven by a combination of 1) decreases in diagnoses of early-stage infection among overseas-born MSM, likely reflecting decreasing incidence, of a similar magnitude to declines in the Australian-born and 2) a substantial increase in late diagnoses in recently arrived overseas-born MSM.

## B. Proportion reporting high or low gay social engagement by country of birth

In Australia, social engagement with gay men has been shown to be an important predictor of uptake of HIV prevention services and behaviours (5-9). In the GCPS, social engagement is measured by the number of gay friends (a 5-point scale) and the amount of free time spent with gay men (a 4-point scale). For presentation in this report, we have added these categories, and classified men as having high social engagement if they scored 5 points or more, and low social engagement if they scored less than 5.

In the Sydney GCPS, overseas -born men were slightly more likely to be highly socially engaged with gay men (Figure 7). This likely reflects the sampling method for the GCPS, which is largely conducted at gay venues and events, supplemented by online recruitment. This pattern is unlikely to be true for recently-arrived non-gay identified overseas-born GBMSM.

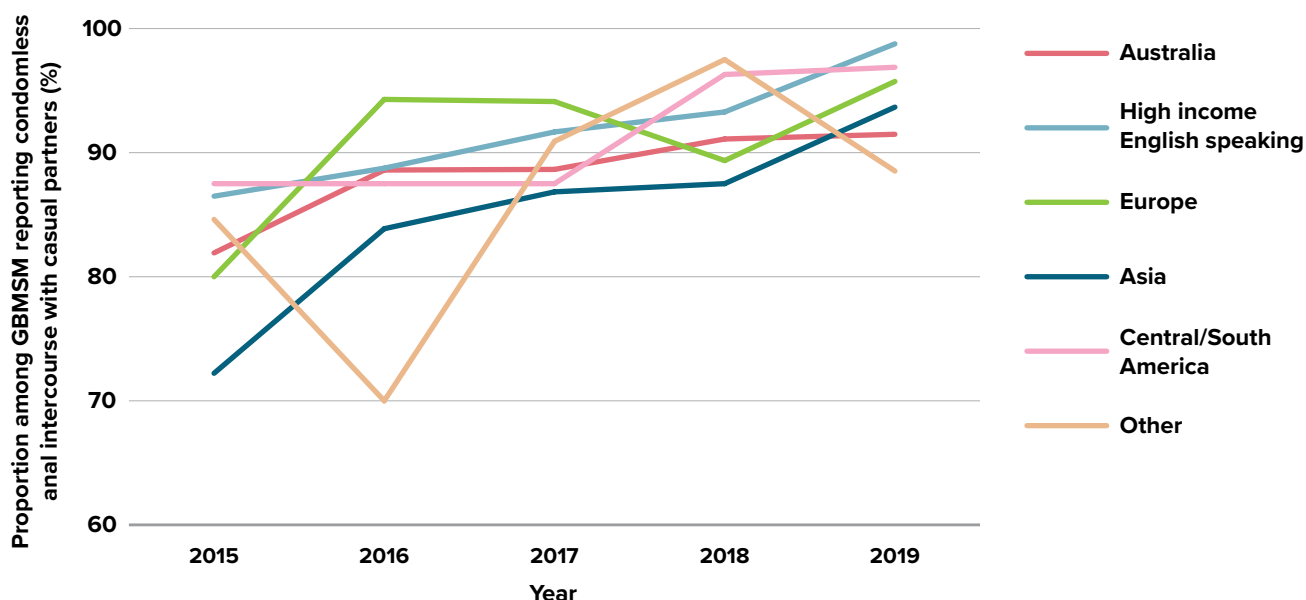
**Figure 7. Proportion of GBMSM with high or low social engagement by country of birth (Sydney GCPS)**



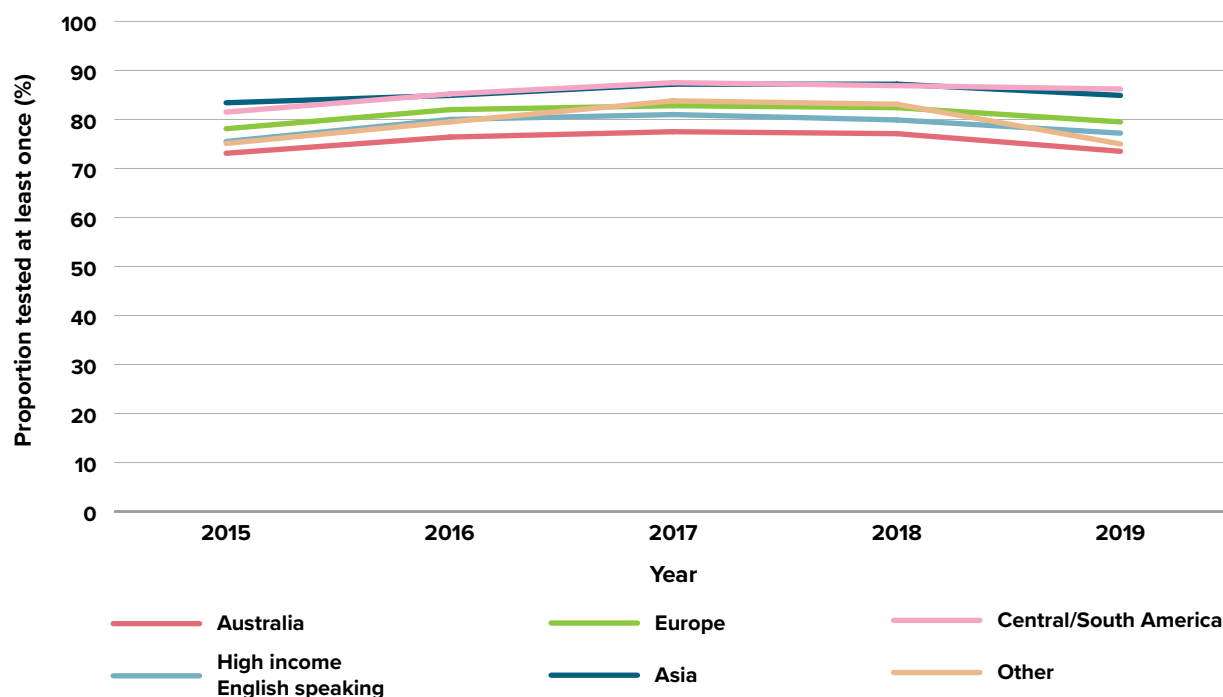
## C. HIV testing by country of birth

HIV testing in the last 12 months increased slightly over the period of the 5-year strategy, and varied little by country of birth in the Sydney GCPS (Figure 8) or in GBMSM attending clinics in the ACCESS network (Figure 9).

**Figure 8. Proportion of GBMSM reporting at least some condomless anal intercourse with casual partners in the last 6 months who reported HIV testing in the last 12 months, by country of birth (Sydney GCPS)**



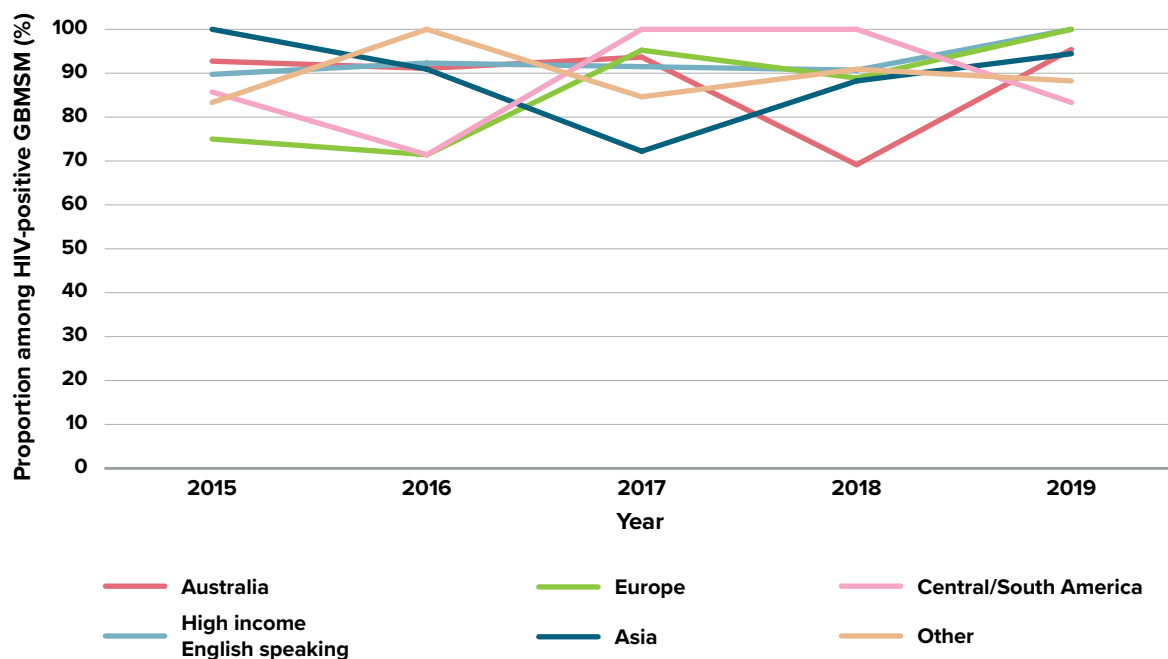
**Figure 9. Proportion of GBMSM attending high case load GP clinics and SHCs who received an HIV test in the last 12 months of their visit by region of birth (the ACCESS Network)**



## D. HIV treatment by country of birth

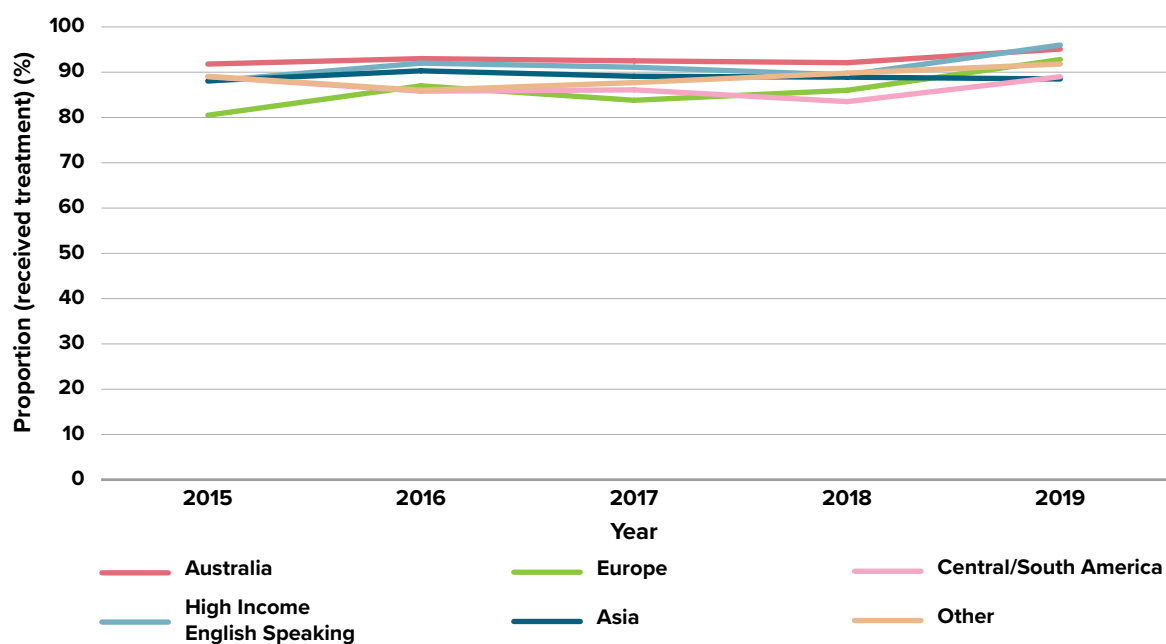
Treatment rates in overseas-born GBMSM were similar to Australian-born men in both the GCPS (Figure 10) and in the ACCESS network (Figure 11). In Figures 10 and 11, this is shown by region of birth.

**Figure 10. Proportion of HIV-positive GBMSM currently receiving antiretroviral treatment by country of birth (Sydney GCPS)**



In ACCESS, similar patterns are seen, including when considering undetectable viral load (UVL). Overall, lower rates of UVL in the overseas-born do not explain the lack of decline in HIV diagnoses in the overseas-born.

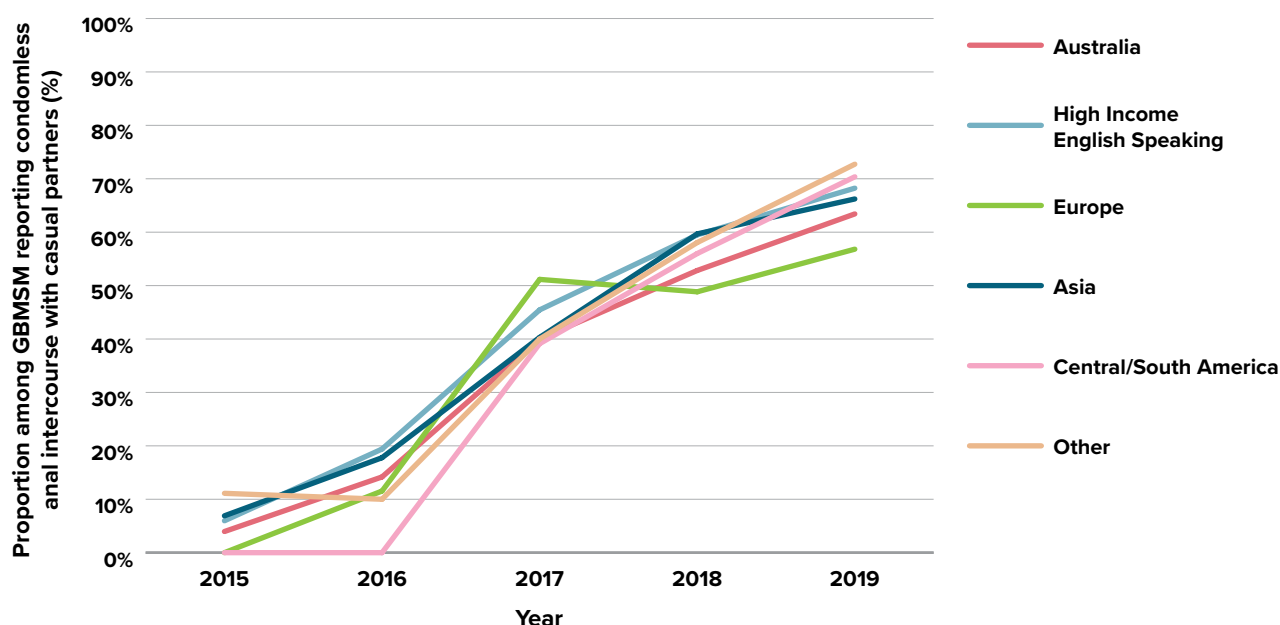
**Figure 11. Proportion of HIV-positive GBMSM on treatment by region of birth (the ACCESS network)**



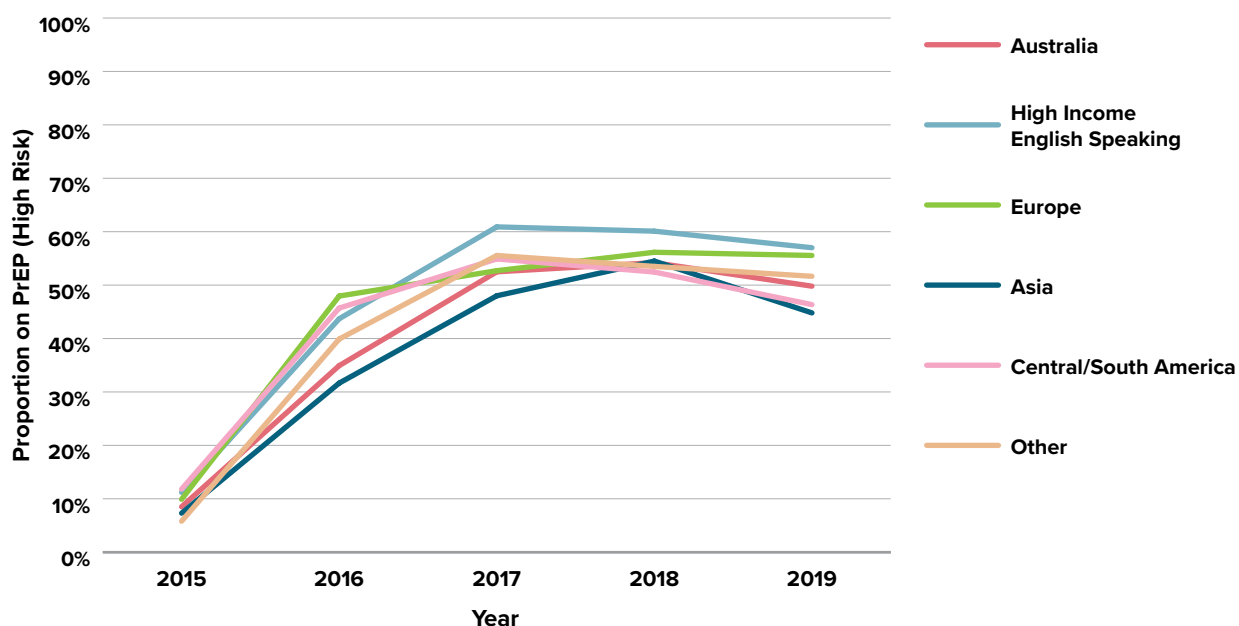
## E. PrEP use by country of birth

Overall, PrEP use among GBMSM reporting condomless anal intercourse with casual partners in the last 6 months increased from close to zero in 2015 to 60-70% in 2019. Among GBMSM in the GCPS and ACCESS, PrEP use did not vary by country of birth (Figure 12). The apparent plateau in the proportion of high-risk GBMSM reporting PrEP in 2017-19 in ACCESS (Figure 13) may be reflective of a shift after EPIC-NSW (a large PrEP access study in NSW) where clinical visits relating primarily to PrEP were increasingly referred to local GP clinics. The increasing proportion of PrEP use in 2017-2019 seen in the GCPS (Figure 12) is much more reflective of Pharmaceutical Benefits System data which show increasing PrEP use in 2018-19.

**Figure 12. Proportion of men who reported at least some condomless anal intercourse with casual partners in the last 6 months who reported PrEP use in the last 6 months, by region of birth (Sydney GCPS)**



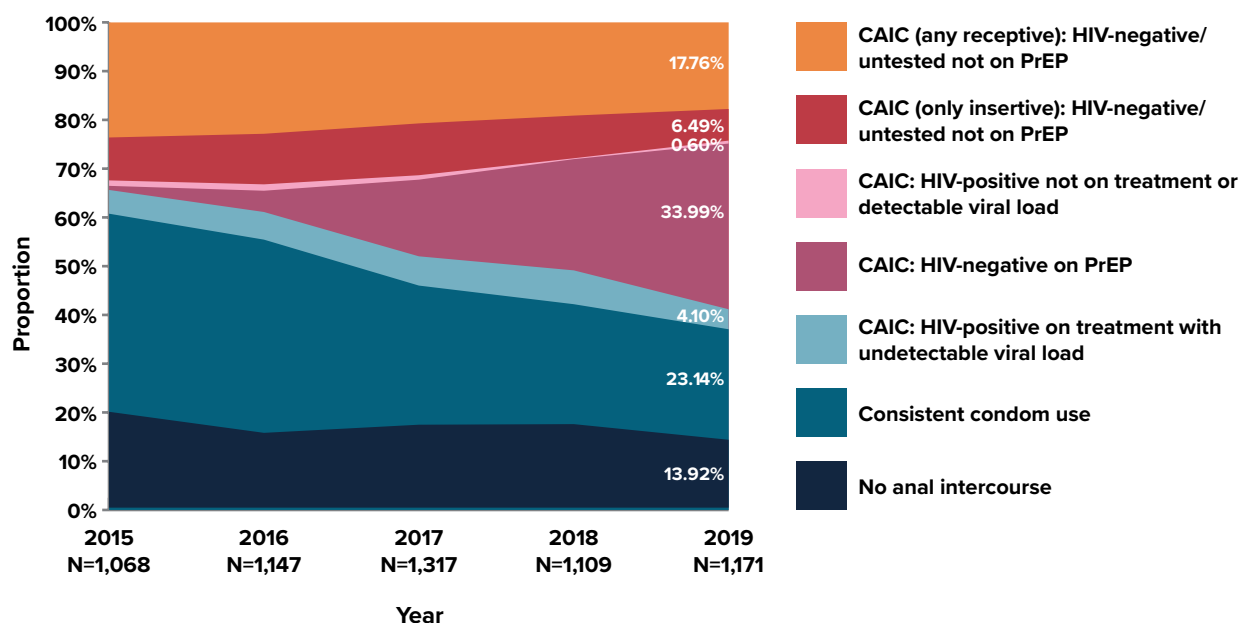
**Figure 13. Proportion of high-risk GBMSM on PrEP, by region of birth (the ACCESS network)**



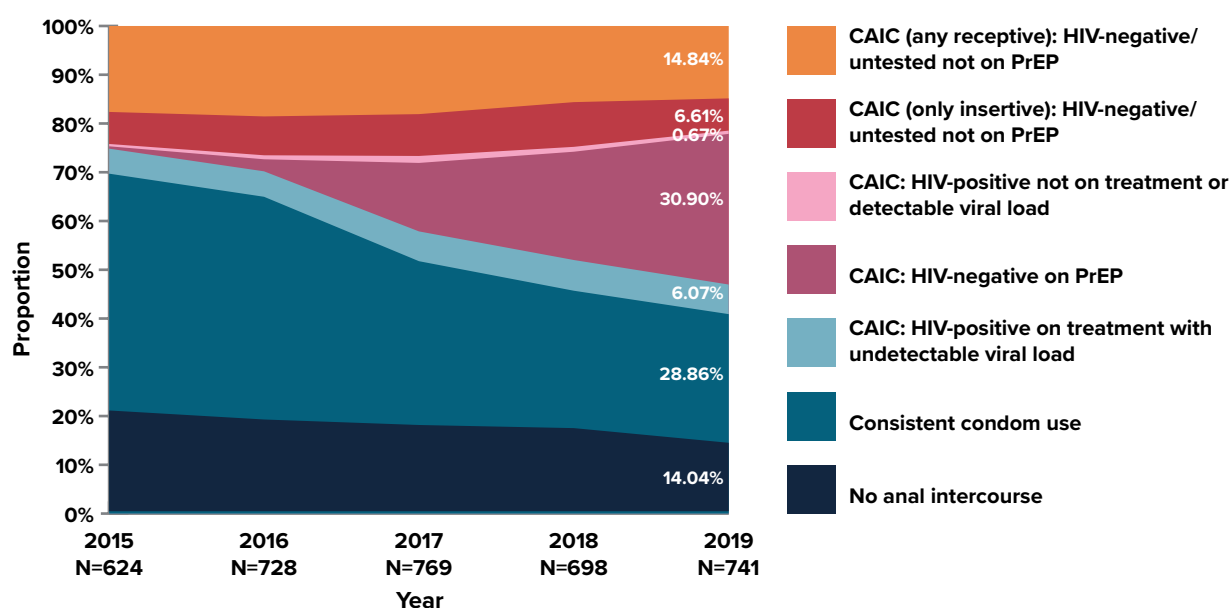
## F. Sexual risk reduction behaviour by country of birth

There were only minor differences in sexual risk reduction behaviours between Australian-born and overseas-born GBMSM in the GCPS (Figures 14 and 15). In 2019, the highest-risk categories below, representing HIV-negative men having condomless anal intercourse with casual partners (CAIC) without protection from PrEP and HIV-positive men having CAIC not on treatment or with detectable viral load, comprised 24.9% of the Australian-born and 22.1% of the overseas-born.

**Figure 14. Sexual risk reduction behaviour among Australian-born GBMSM who had casual sexual partners (Sydney GCPS)**



**Figure 15. Sexual risk reduction behaviour among overseas-born GBMSM who had casual sexual partners (Sydney GCPS)**



# 3.

## Trends in HIV

in gay, bisexual and other men who have sex with men by residence in gay suburbs



Work within the NHPPP has recently identified striking differences in trends in HIV diagnoses in NSW by area of residence, where residence is grouped by the proportion of adult males who identify as gay. In the absence of census data on sexuality, we used a recently developed estimation method which is based on 1) Australian Census data on co-habiting male couples and 2) survey data on the proportion of gay males who cohabit (9). We grouped postcodes as having >20%, 5-19% and < 5% of adult males estimated to be gay according to this method. Overall, 23% of gay men were estimated to live in a >20% postcode, 24% in a 5-19% postcode, and 53% in a <5% postcode. These data are summarised in Table 1.

**Table 1: NSW postcodes by proportion of male population estimated to be gay (4)**

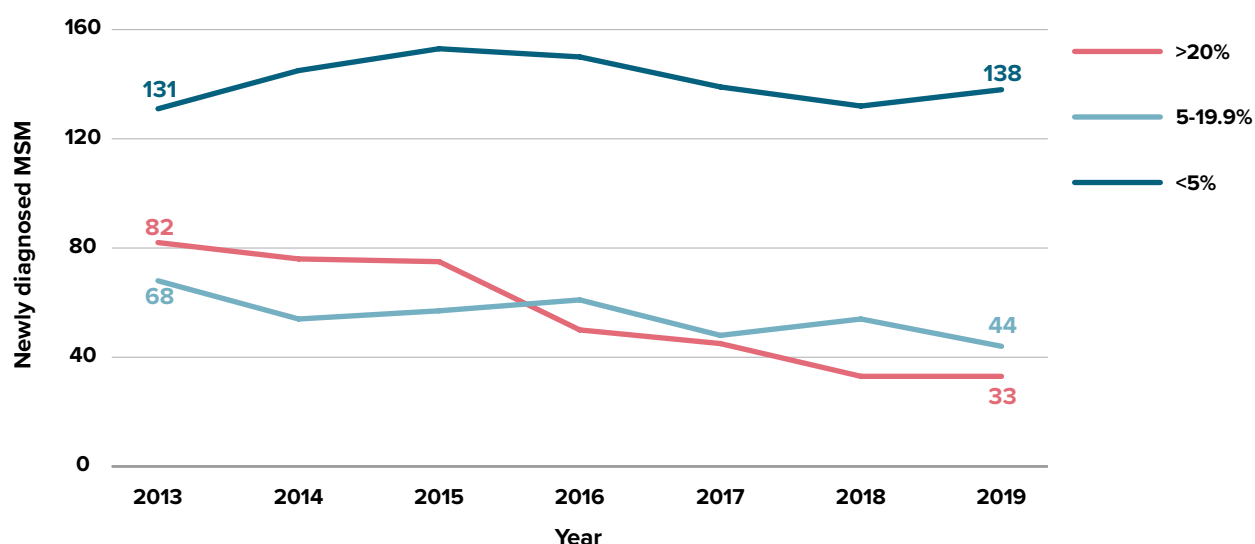
Estimated proportion of adult male population that is gay	Postcode	Suburb names (selected)
>20%	2010	Darlinghurst, Surry Hills
	2043	Erskineville
	2015	Beaconsfield, Eveleigh, Alexandria
	2011	Rushcutters Bay, Woolloomooloo, Elizabeth Bay, Potts Point
	2016	Redfern
	2042	Newtown, Enmore
5-19%	2050	Missenden Road, Camperdown
	2017	Waterloo, Zetland
	2044	Tempe, St Peters, Sydenham
	2021	Paddington, Moore Park, Centennial Park
	2008	Chippendale, Darlington
	2797	Garland, Lyndhurst
	2048	Stanmore, Westgate
	2049	Petersham, Lewisham
	2009	Pymont
	2027	Darling Point, Edgecliff, Point Piper
	2205	Wolli Creek, Turrella, Arncliffe
	2037	Forest Lodge, Glebe
	2025	Woollahra
	2204	Marrickville, Marrickville South
	2203	Dulwich Hill

Estimated proportion of adult male population that is gay	Postcode	Suburb names (selected)
5-19%	2028	Double Bay
	2038	Annandale
	2020	Mascot
	2040	Leichhardt, Lilyfield
	2000	The Rocks, Sydney, Millers Point, Haymarket, Barangaroo
	2130	Summer Hill
	2296	Islington
	2007	Ultimo, Broadway
	2039	Rozelle
	2022	Queens Park, Bondi Junction
	2060	Waverton, North Sydney, McMahon's Point, Lavender Bay
<5%	All others	All other postcodes

## A. Surveillance of HIV diagnoses by proportion of adult males in postcode who are gay

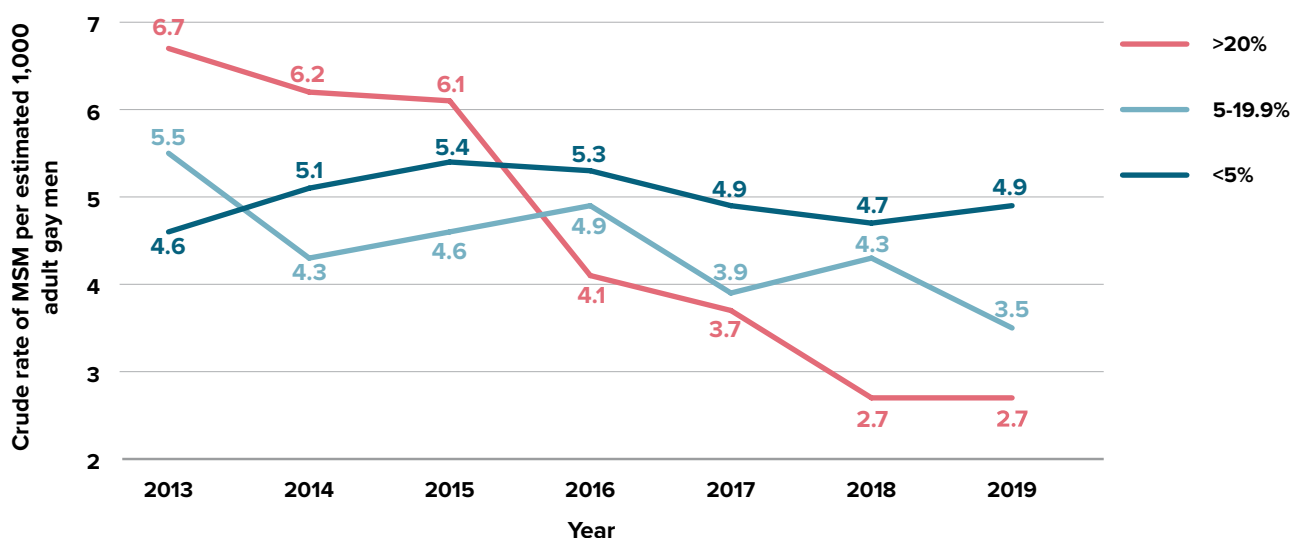
**Trends in all HIV diagnoses:** Between 2015 and 2019, among MSM residing in postcodes where >20% of adult males were estimated to be gay, HIV diagnoses declined by 56% (Figure 16). In those residing in postcodes with an estimated proportion gay of 5-19%, there was a decline of 23%. In postcodes where less than 5% were estimated to be gay, there was only a 10% decline.

**Figure 16. HIV diagnoses in MSM by proportion of adult males in the postcode who are gay**



Using the estimated gay population denominators of the gay postcode groupings, and the number of new HIV diagnoses annually among MSM, we have estimated crude rates of HIV diagnoses for the 2013-2019 period in Figure 17. This shows a dramatic change in the 2015-19 period. In 2015, men living in the >20% postcodes had the highest annual rates of HIV (6.1/1,000 per year), but by 2019 they had the lowest rates (2.9/1000). By 2019, the highest rates of HIV (4.9/1,000) occurred in men living in the <5% postcodes, completely reversing the pattern of earlier years.

**Figure 17. Crude rates of HIV diagnoses in MSM per 1000 adult men by proportion of adult males in the postcode who are gay**

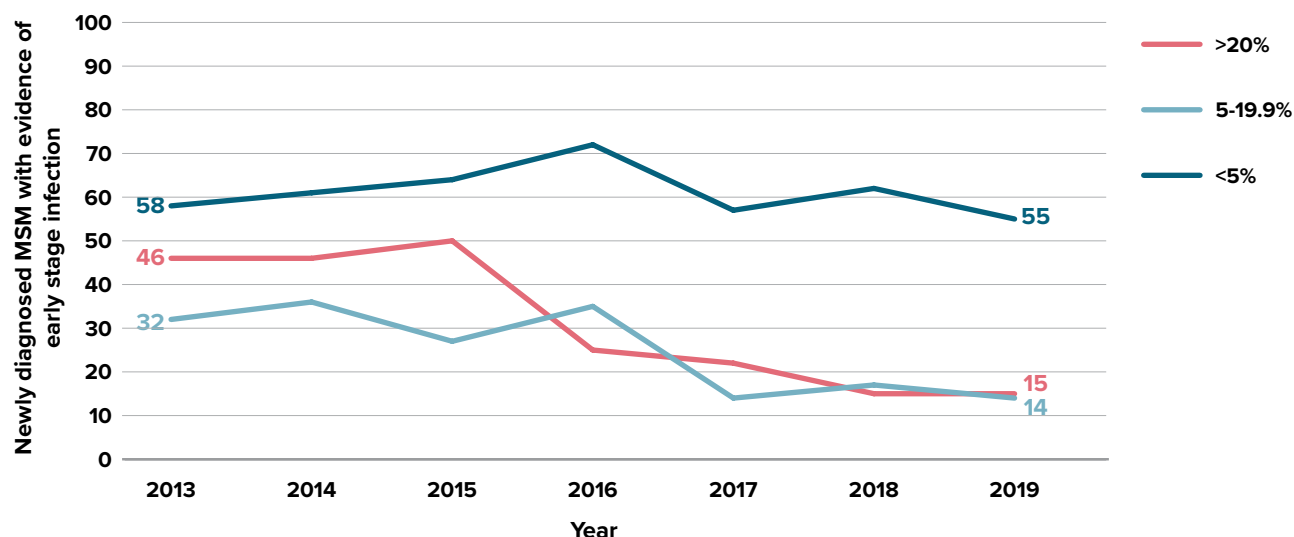


Estimated population proportion of total adult gay men in each group:

>20% = 23%, 5-19% = 24%, <5 = 53%

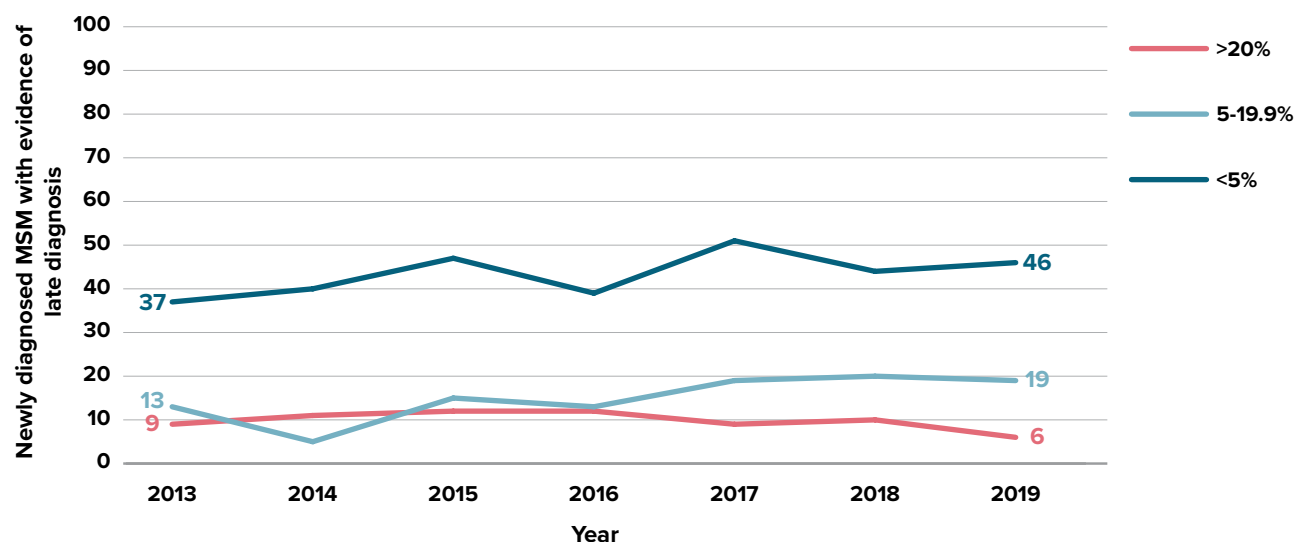
**Trends in HIV diagnoses with evidence of early stage infection:** Between 2015 and 2019, among MSM residing in postcodes where >20% of adult males were estimated to be gay, HIV diagnoses with evidence of early stage infection declined by 70% (Figure 18). In those residing in postcodes with an estimated proportion gay of 5-19%, there was a decline of 48%. In postcodes where less than 5% were estimated to be gay, there was only a 14% decline.

**Figure 18. New HIV notifications with evidence of early infection by proportion of adult males in the postcode who are gay**



**Trends in HIV diagnoses with evidence of late diagnosis:** Between 2015 and 2019, among MSM residing in postcodes where >20% of adult males were estimated to be gay, late HIV diagnoses were generally very uncommon and declined by 50% to only 6 cases in 2019 (Figure 19). In those residing in postcodes with an estimated proportion gay of 5-19%, there was a 27% increase. In postcodes where less than 5% were estimated to be gay, late HIV diagnoses were much more common and there was little change between 2015 and 2019.

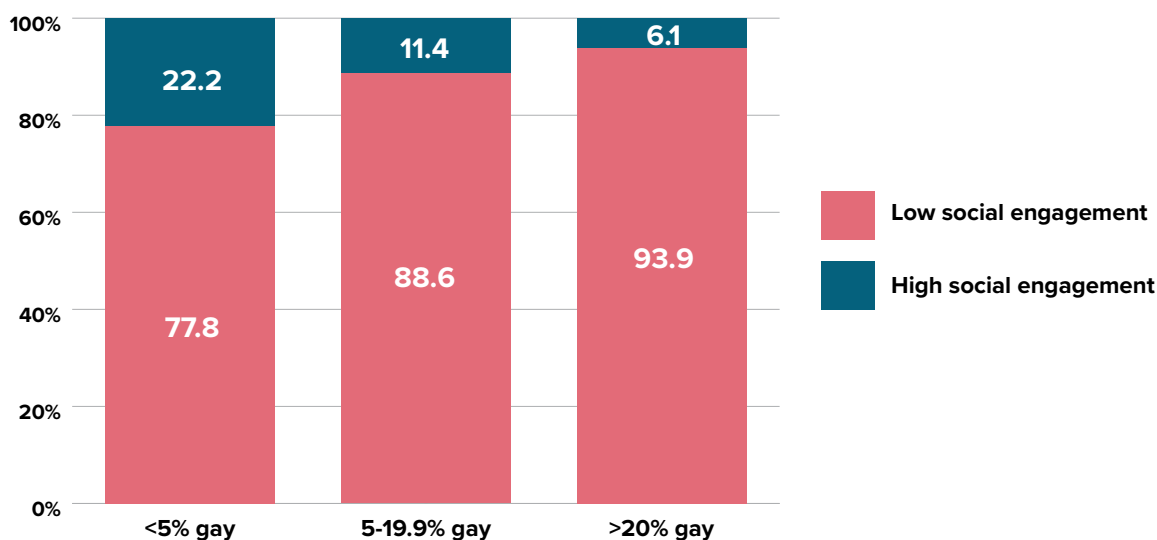
**Figure 19. New HIV notifications with evidence of late HIV infection by proportion of adult males in the postcode who are gay**



## B. Proportion reporting high or low gay social engagement by proportion of adult males in postcode who are gay

In the Sydney GCPS, men who resided in the gay suburbs were much more likely to be highly socially engaged with gay men (Figure 20).

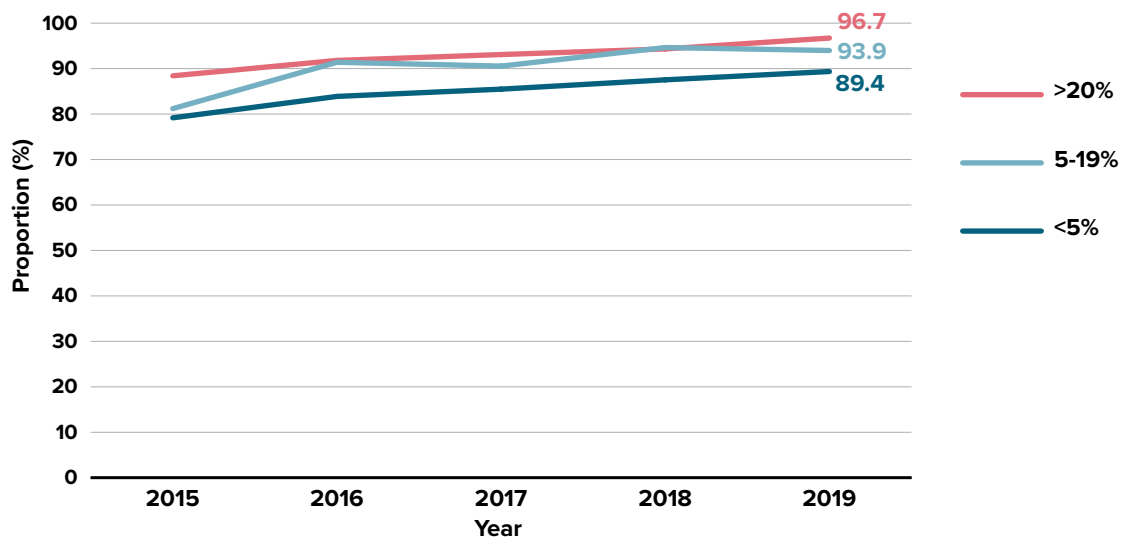
**Figure 20. Proportion of GBMSM with high or low gay social engagement among GBMSM by proportion of postcode gay (Sydney GCPS)**



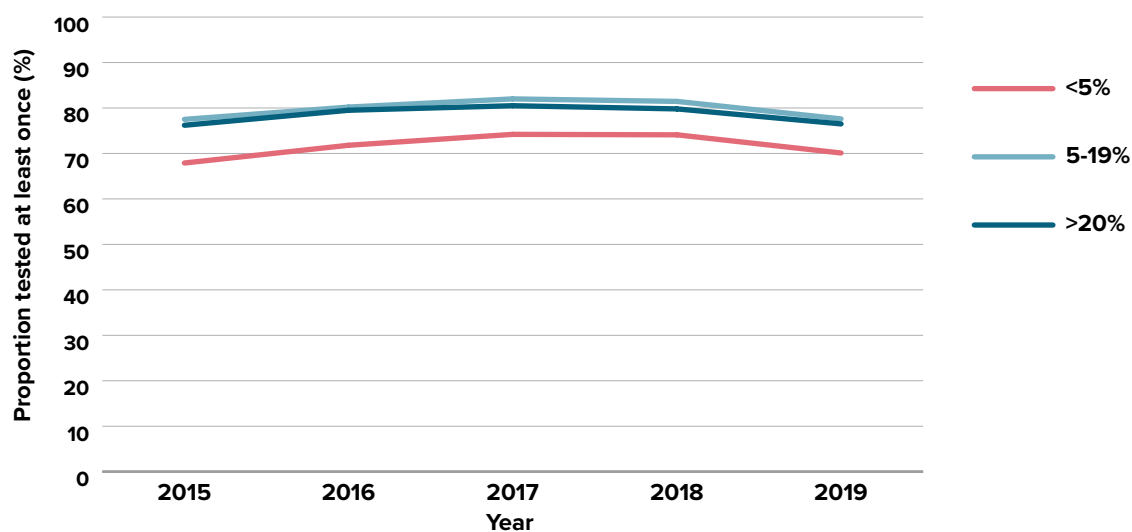
## C. HIV testing by proportion of adult males in postcode who are gay

High-risk GBMSM in the <5% postcodes had slightly lower rates of HIV testing in both the GCPS (Figure 21) and ACCESS (Figure 22) (approximately 10% difference in testing last year). GBMSM in both the 5-19% and >20% postcodes had very similar rates of testing.

**Figure 21. Proportion of men who reported an HIV test in the last 12 months among men who reported some condomless anal intercourse with casual partners in the last 6 months by proportion of adult males in the postcode who are gay (Sydney GCPS)**



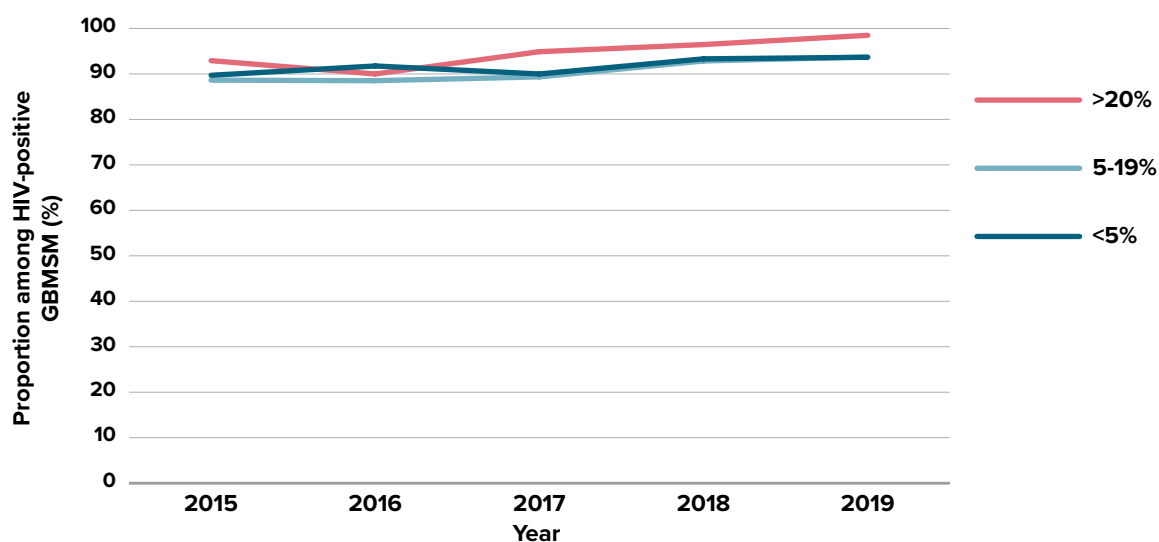
**Figure 22. Proportion of GBMSM attending high caseload GP clinics and SHCs who received an HIV test in the last 12 months of their visit, by proportion of adult males in the postcode who are gay (the ACCESS Network)**



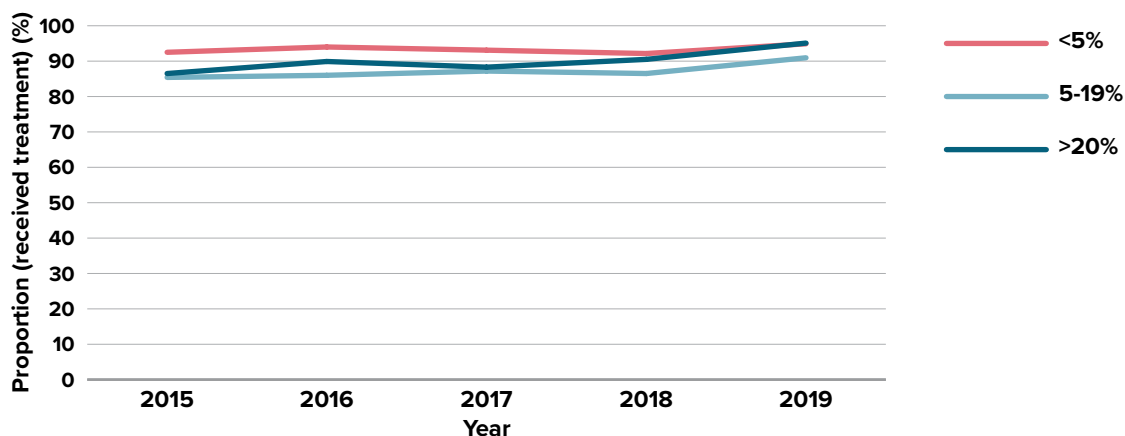
## D. HIV treatment by proportion of adult males in postcode who are gay

Among HIV positive people, rates of treatment (Figures 23 and 24) and UVL (Figures 25 and 26) did not differ by postcode category.

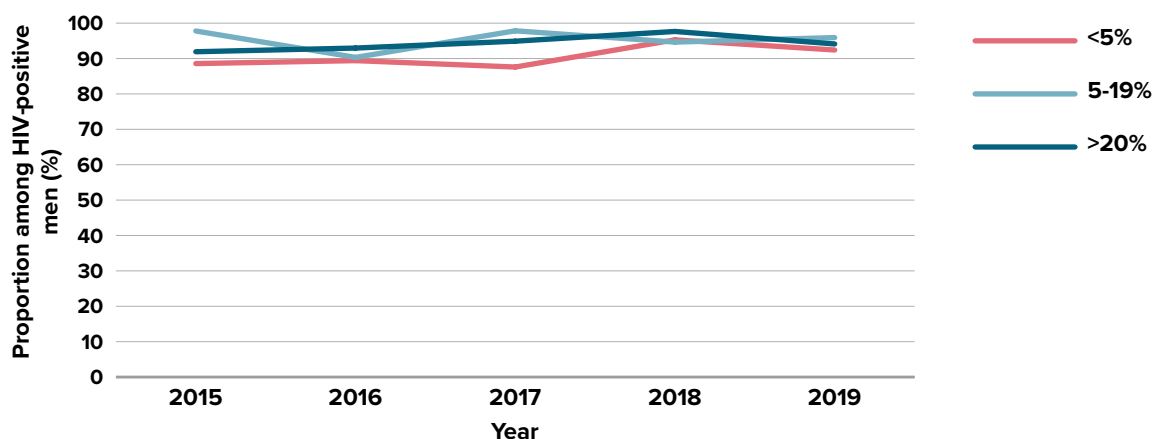
**Figure 23. HIV- positive men on treatment, by proportion of adult males in the postcode who are gay (Sydney GCPS)**



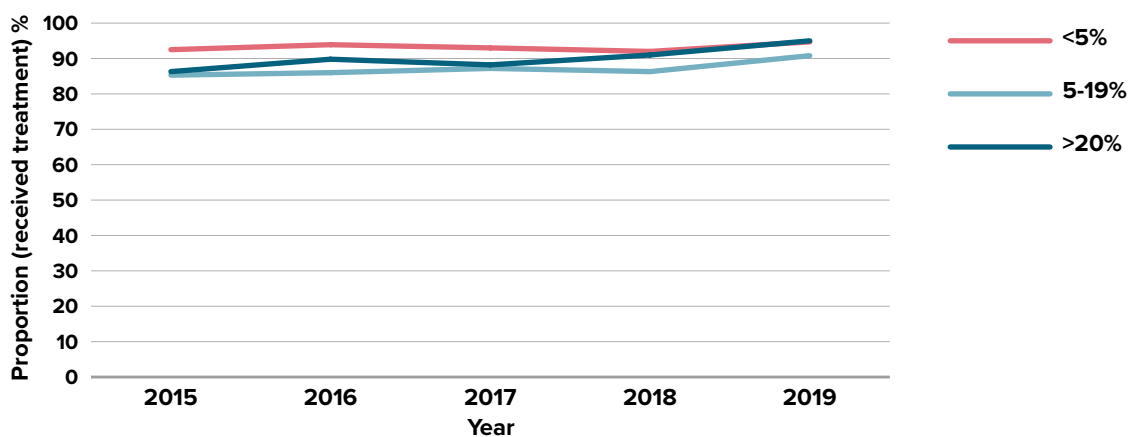
**Figure 24. Proportion of HIV positive patients on treatment, by proportion of adult males in the postcode who are gay (the ACCESS network)**



**Figure 25. HIV-positive men who report an undetectable viral load, by proportion of adult males in the postcode who are gay (Sydney GCPS)**



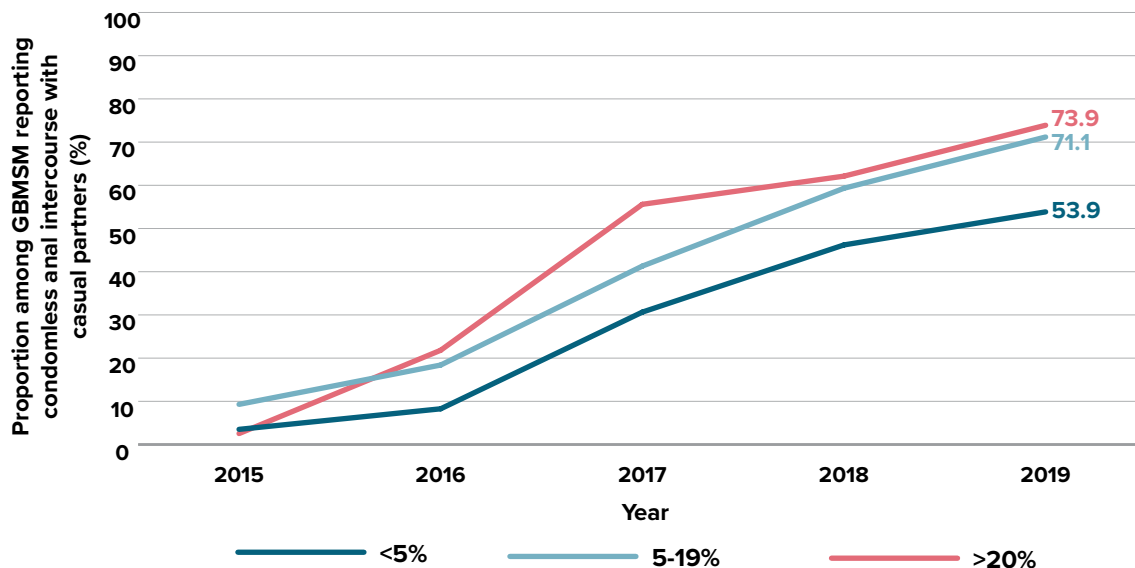
**Figure 26. Proportion of HIV-positive GBMSM recorded on treatment with undetectable viral load by proportion of adult males in the postcode who are gay (the ACCESS network)**



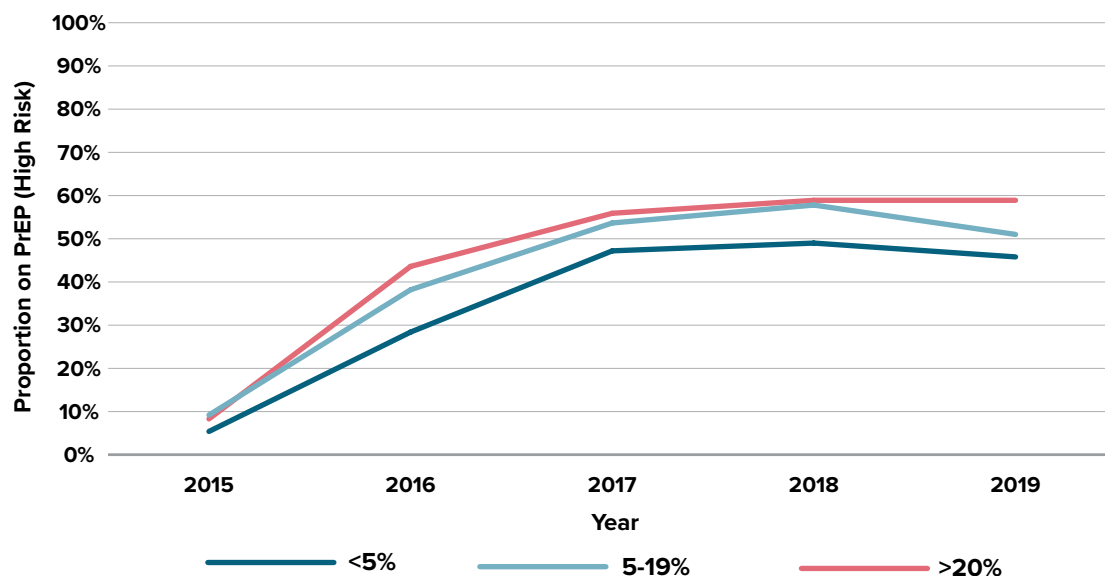
## E. PrEP use by proportion of adult males in postcode who are gay

Rates of PrEP use were about 20% lower (54% v 74%) in high-risk GBMSM who lived in the <5% suburbs than in >20% suburbs in both GCPS (Figure 27) and ACCESS data (Figure 28).

**Figure 27. Proportion of men who reported at least some condomless anal intercourse with casual partners in the last 6 months who reported PrEP use in the last 6 months, by proportion of adult males in the postcode who are gay (Sydney GCPS)**



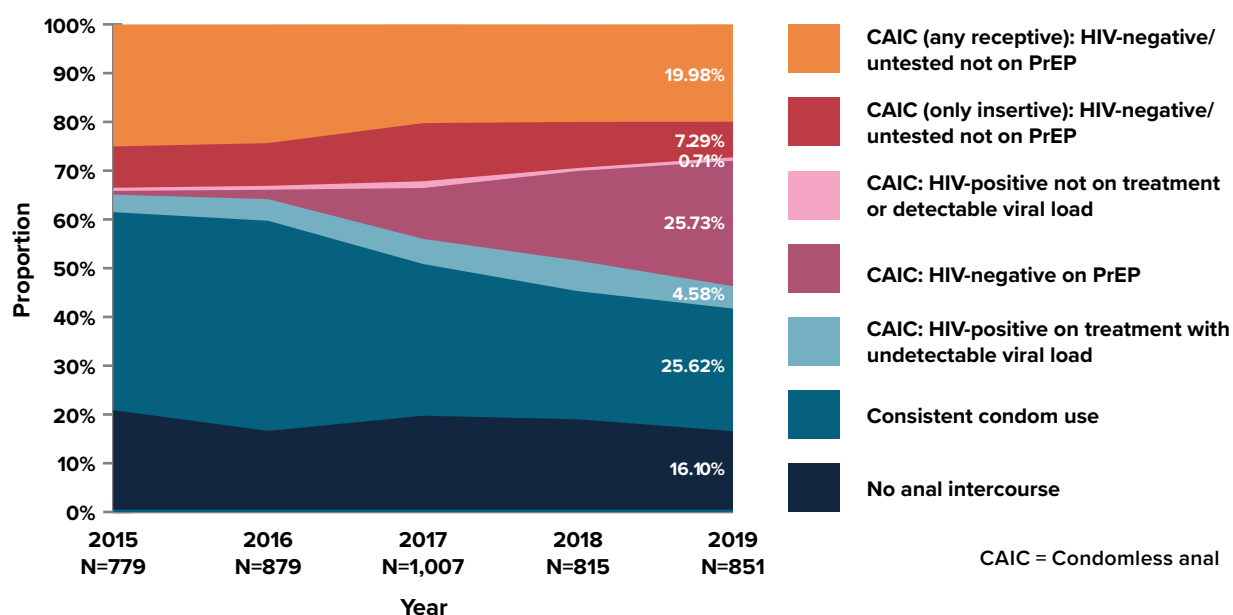
**Figure 28. Proportion of high-risk GBMSM on PrEP by proportion of adult males in the postcode who are gay (the ACCESS network)**



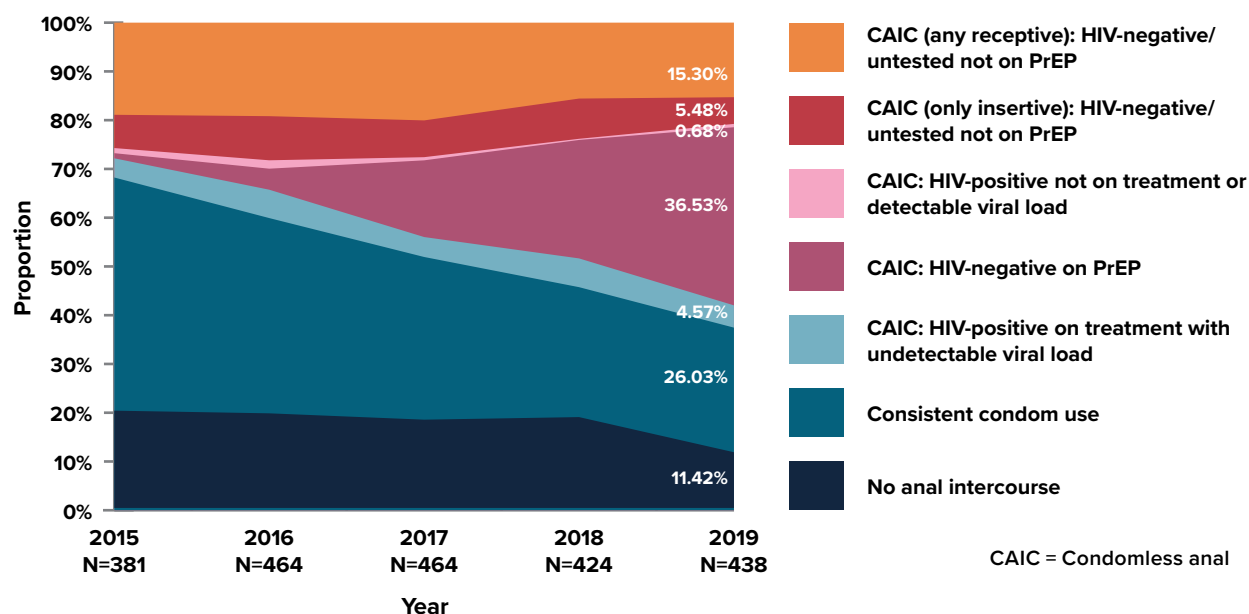
## F. Sexual risk reduction behaviour by proportion of postcode who are gay

There were substantial differences in sexual risk reduction behaviours by area of residence, which were largely driven by much lower levels of PrEP use in the <5% suburbs. In 2019, the highest-risk categories below, representing HIV negative men having CAIC without protection from PrEP and HIV positive men having CAIC not on treatment or with detectable viral load, comprised 28.0%, 21.5% and 19.8% of GBMSM in the <5%, 5-19% and >20% suburbs respectively (Figures 29, 30 and 31).

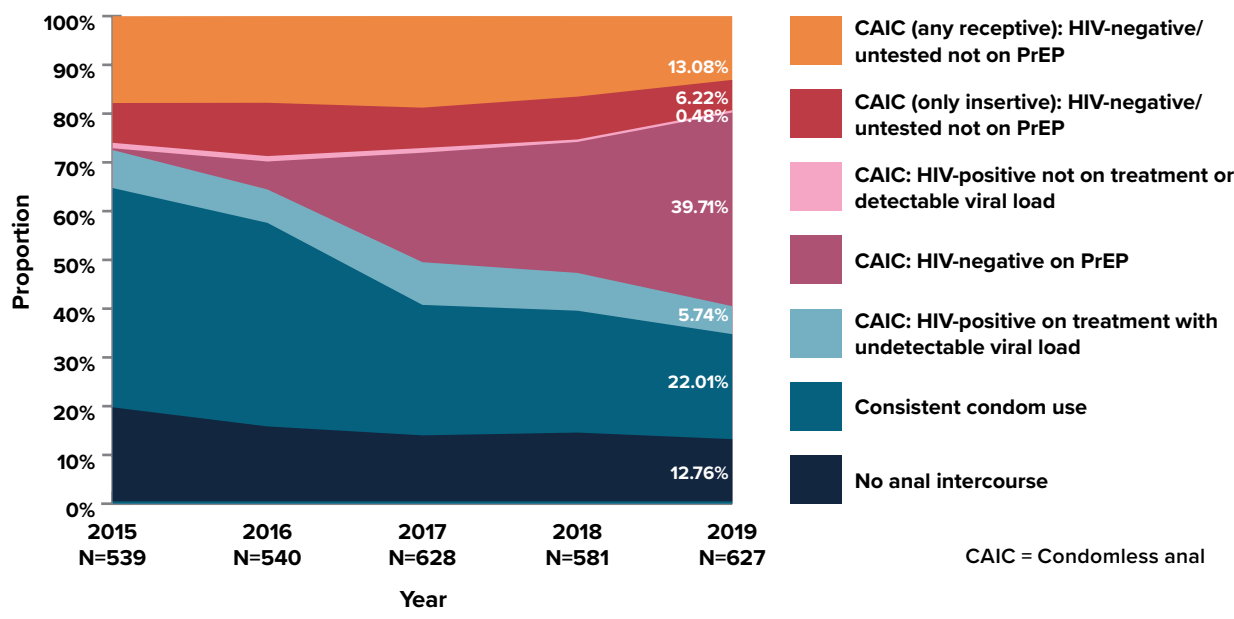
**Figure 29. Sexual risk reduction behaviour among GBMSM in suburbs with <5% of adult males who are gay (Sydney GCPS)**



**Figure 30. Sexual risk reduction behaviour among GBMSM in suburbs with 5-19% of adult males who are gay (Sydney GCPS)**



**Figure 31. Sexual risk reduction behaviour among GBMSM in suburbs with >20% of adult males who are gay (Sydney GCPS)**



# 4.

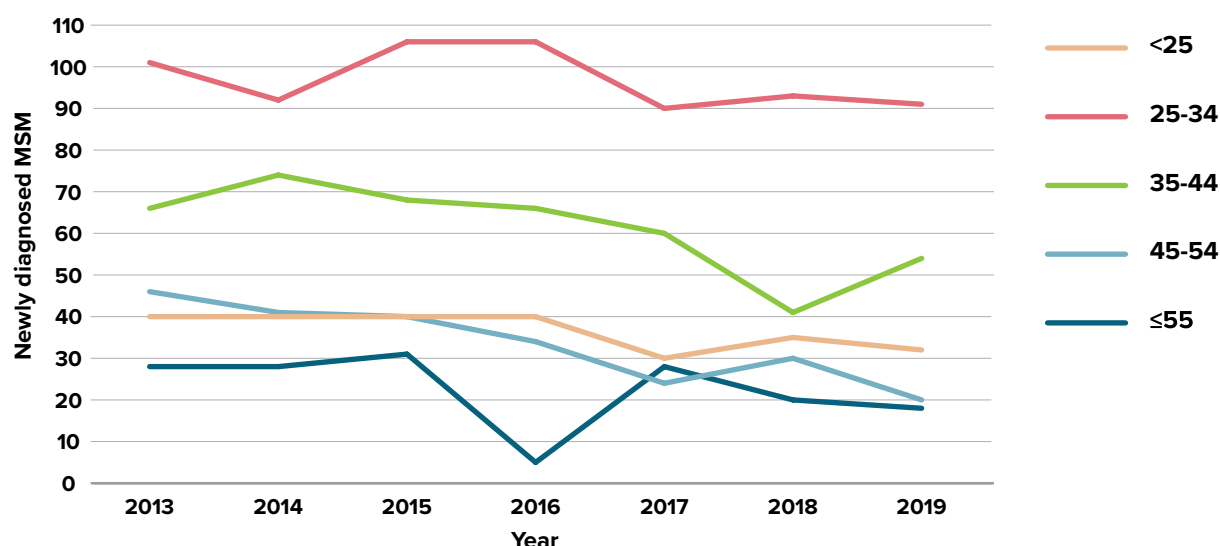
## Trends in HIV

in gay, bisexual and other men who have sex with men by age

### A. Surveillance of HIV diagnoses by age

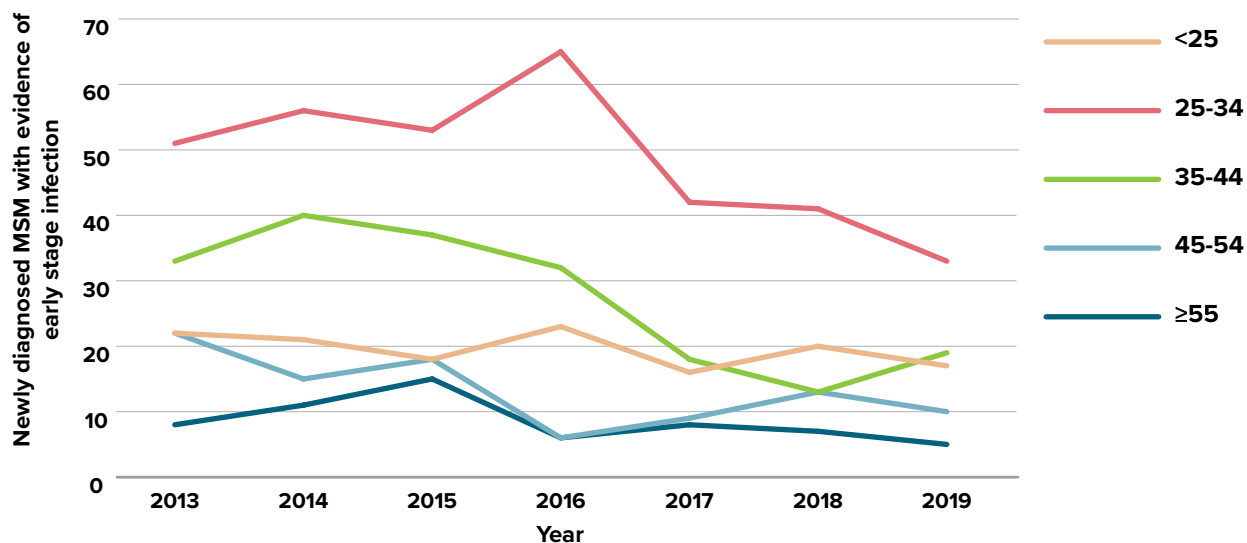
**Trends in all HIV diagnoses:** Between 2015 and 2019 there were declines among all age groups, with the greatest declines among MSM aged 45-54 and 55 and over (50% and 42% respectively), and lower declines among MSM aged under 25, 25-34, and 35-44 (20%, 14%, and 21% respectively, Figure 32).

**Figure 32. New HIV notifications by age**



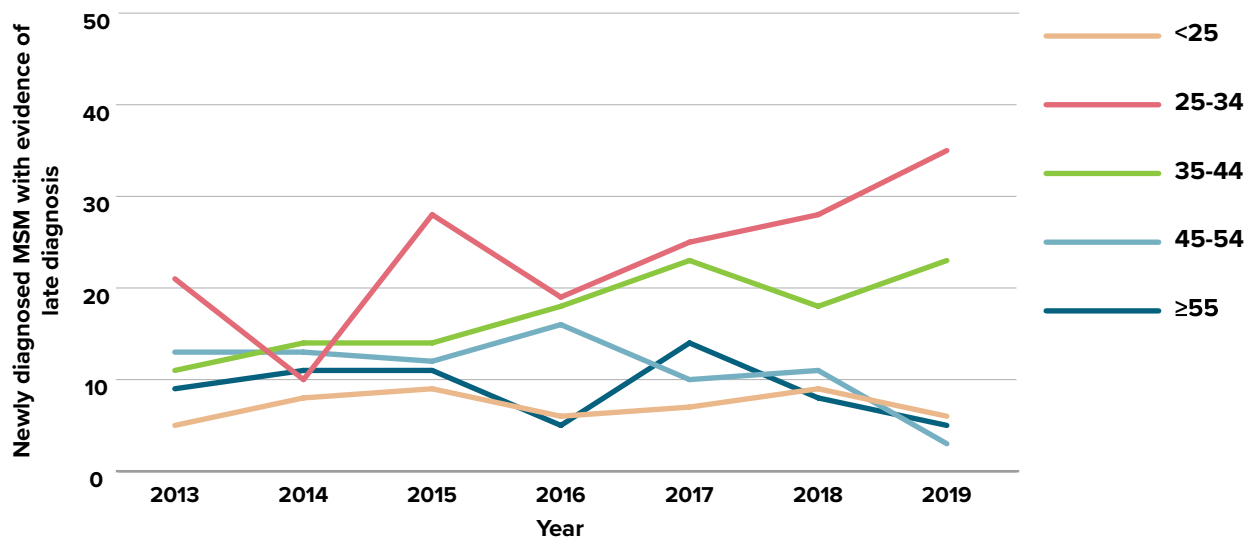
**Trends in HIV diagnoses with evidence of early stage infection:** Between 2015 and 2019 there were declines in notifications with evidence of early infection among all age groups, with larger declines among MSM aged 25-34, 35-44, 45-54 and 55 and over (38%, 49%, 44%, and 67% respectively), compared with a much lower decline among MSM aged under 25 (6%, Figure 33).

**Figure 33. New HIV notifications with evidence of early infection by age**



**Trends in HIV diagnoses with evidence of late diagnosis:** Between 2015 and 2019 there were declines in notifications with evidence of late stage HIV infection among men aged under 25, 45-54, and 55 and over (33%, 83%, and 55% respectively). In contrast, there were increases in late diagnoses among MSM aged 25-34 and 35-44 (25% and 64%, respectively, Figure 34).

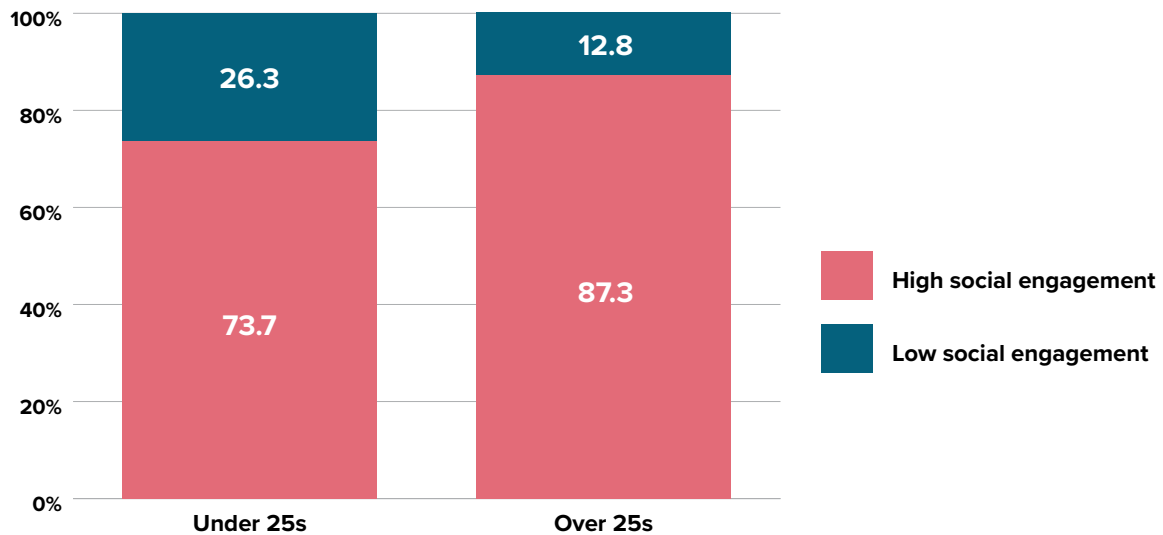
**Figure 34. New HIV notifications with evidence of late stage infection by age**



## B. Proportion of GBMSM with high or low gay social engagement by age group

In the Sydney GCPS, men aged under 25 were less socially engaged with gay men (Figure 35).

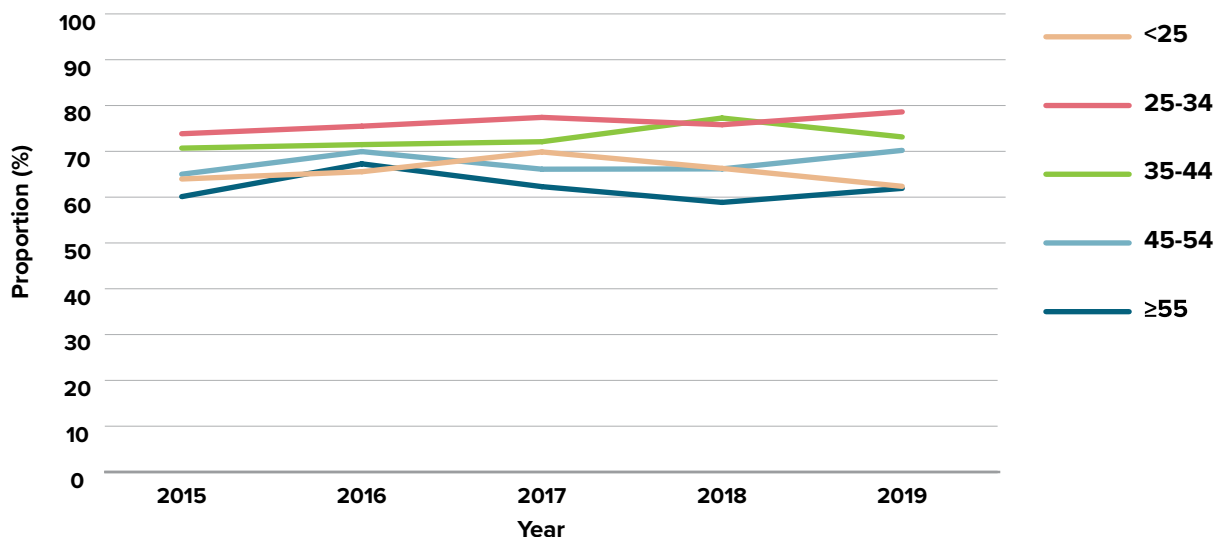
**Figure 35. Proportion of GBMSM with high or low gay social engagement by age (Sydney GCPS)**



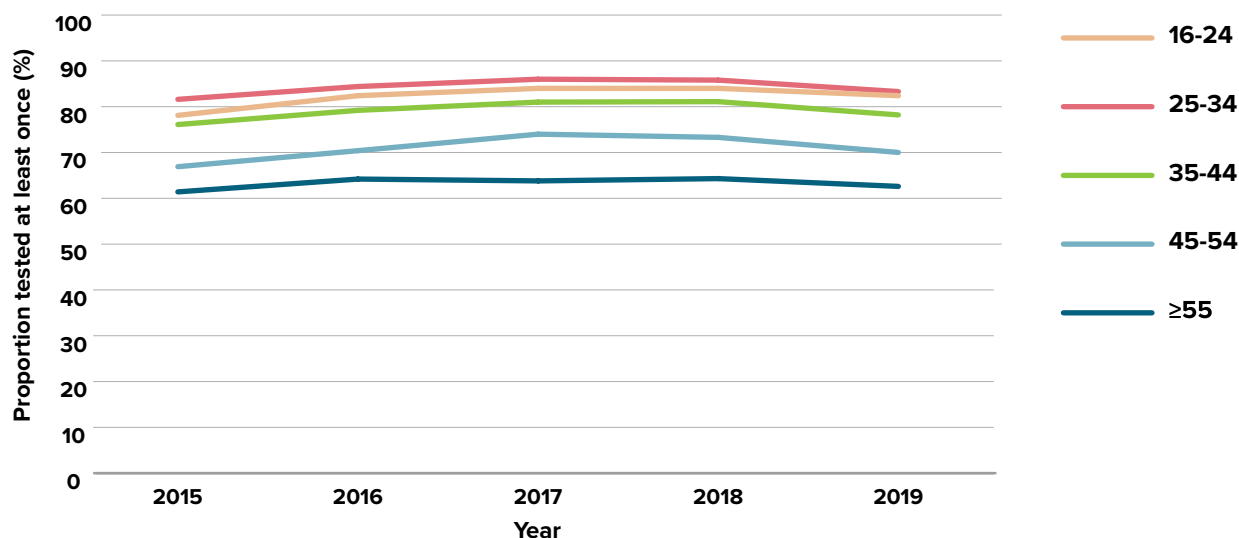
## C. HIV testing by age group

In the GCPS, HIV testing rates among high-risk GBMSM were about 10% lower in those aged <25 years, and in those aged >55 years than in the other age groups (Figure 36). A lower proportion testing in the last 12 months was not present in the ACCESS data (Figure 37), suggesting that once young men are clinically-engaged, they do receive frequent HIV testing.

**Figure 36. HIV testing in the last 12 months, by age (Sydney GCPS)**



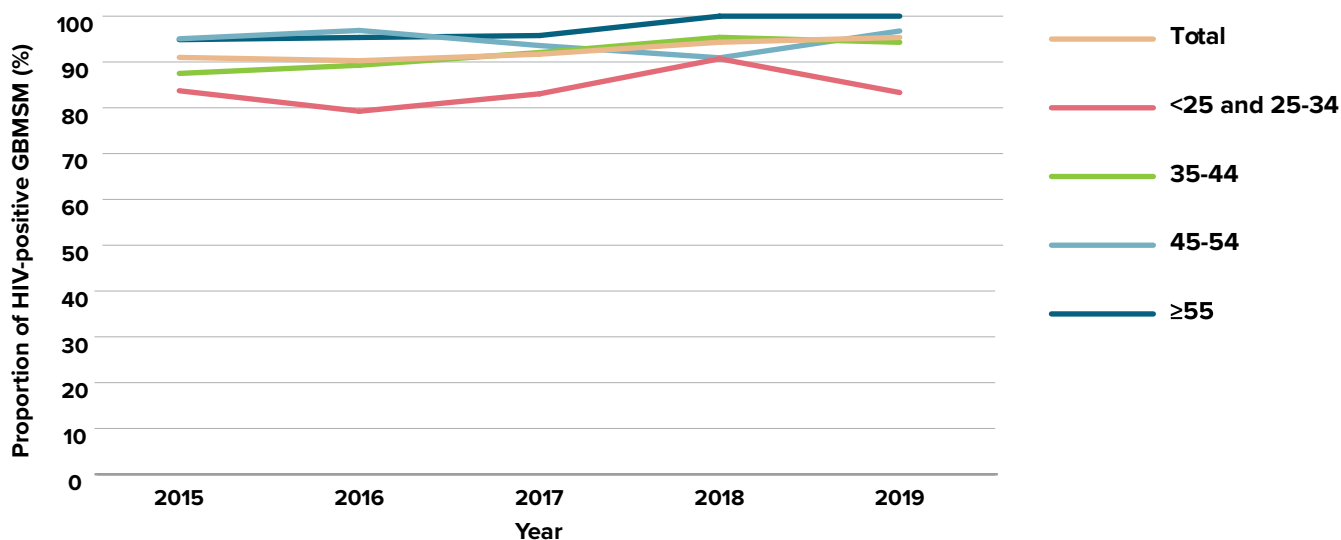
**Figure 37. Proportion of GBMSM attending high caseload GP clinics and SHCs who received an HIV test in the last 12 months of their visit, by age (the ACCESS network)**



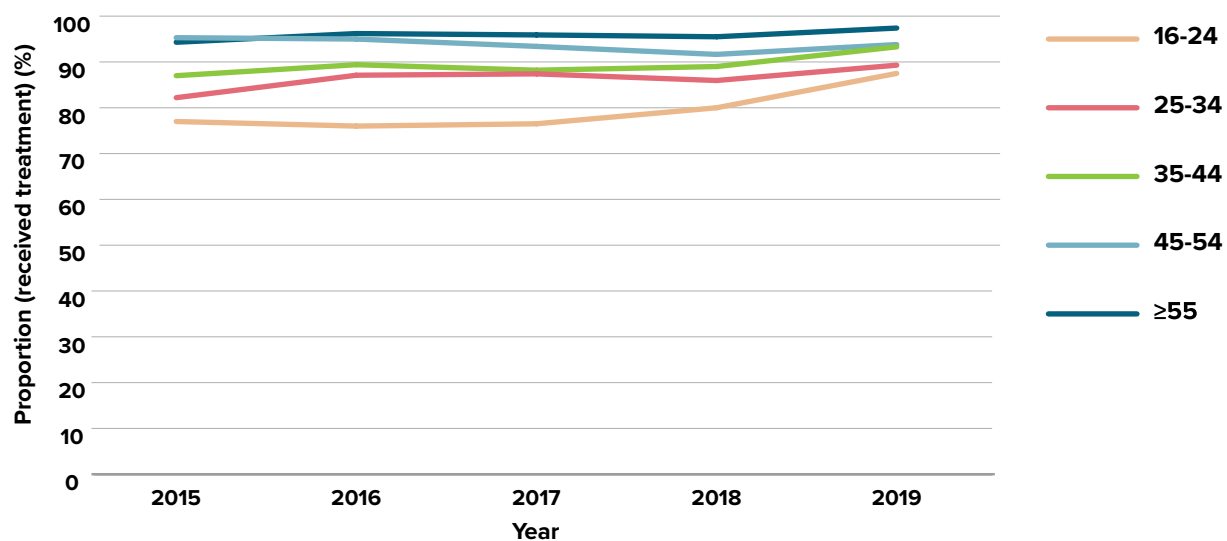
## D. HIV treatment by age group

In both the Sydney GCPS (Figure 38) and in ACCESS (Figure 39), there was some evidence of slightly lower treatment rates (perhaps 10% lower) in those aged <35. This was based on rather small numbers. Please note, as the number in the age group less than 25 contained fewer than 5 men in some years, the two youngest age groups were combined in the GCPS. Similar patterns were seen for undetectable viral load (Figures 40 and 41)

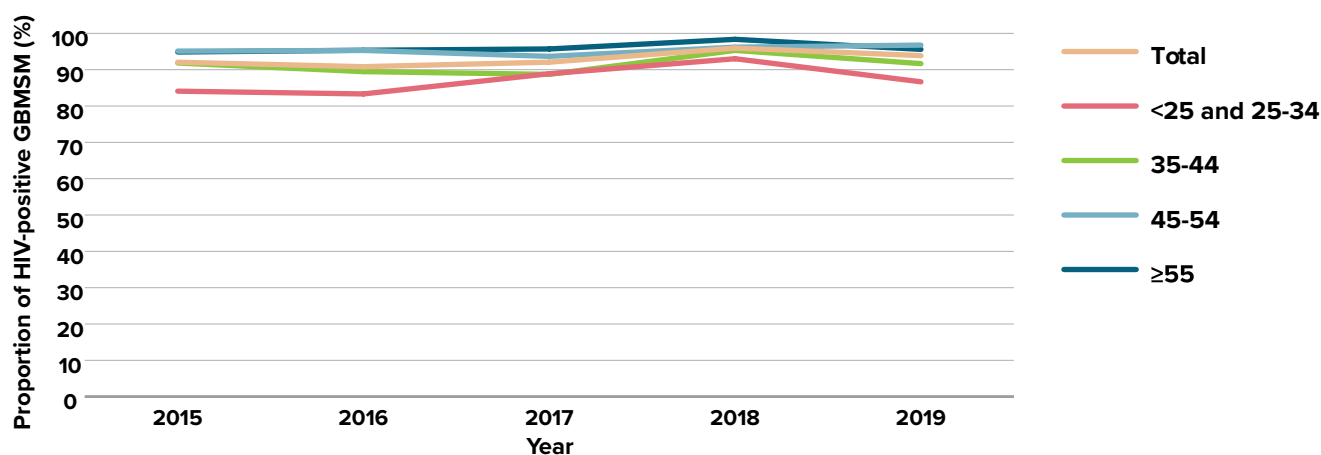
**Figure 38. HIV-positive men on treatment, by age (Sydney GCPS)**



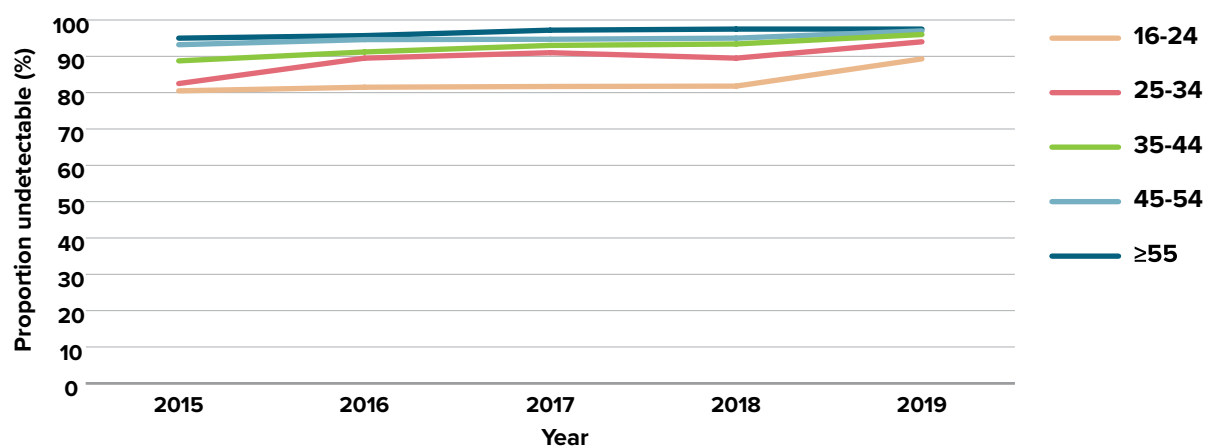
**Figure 39. Proportion of HIV-positive GBMSM recorded on treatment, by age (the ACCESS network)**



**Figure 40. HIV-positive men who reported an undetectable viral load, by age (Sydney GCPS)**



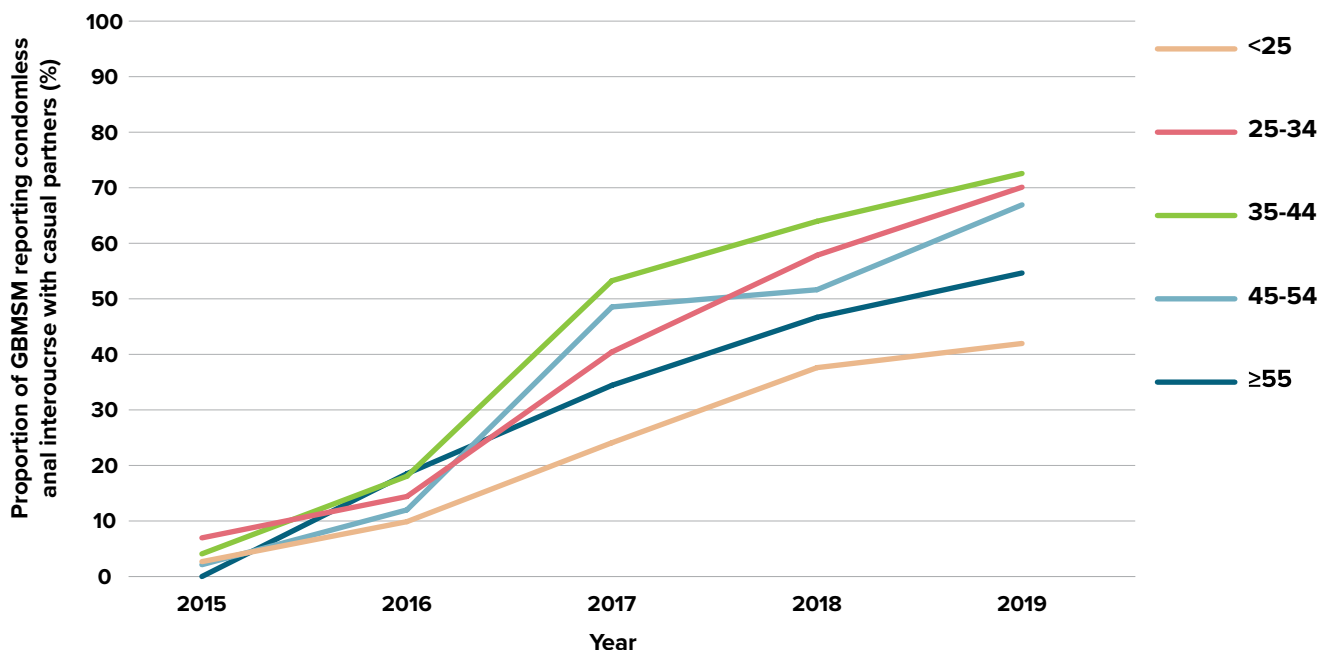
**Figure 41. Proportion of HIV-positive GBMSM recorded on treatment with an undetectable viral load, by age (the ACCESS network)**



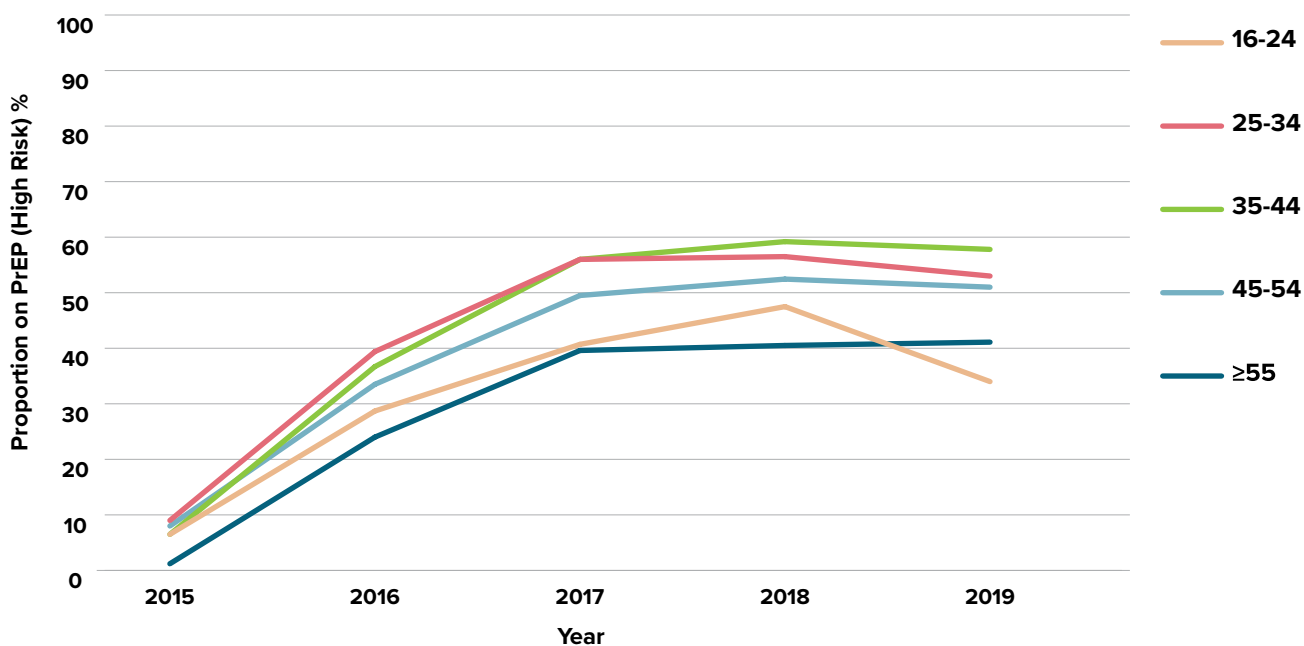
## E. PrEP use by age group

Use of PrEP among high-risk GBMSM was substantially lower among men aged <25 (42%) and ≥55 (about 50%) compared to men aged 35-44 (73%) in both the GCPS (Figure 42) and ACCESS (Figure 43).

**Figure 42. Proportion of men who reported at least some condomless anal intercourse with casual partners in the last 6 months who reported PrEP use in the last 6 months by age (Sydney GCPS)**



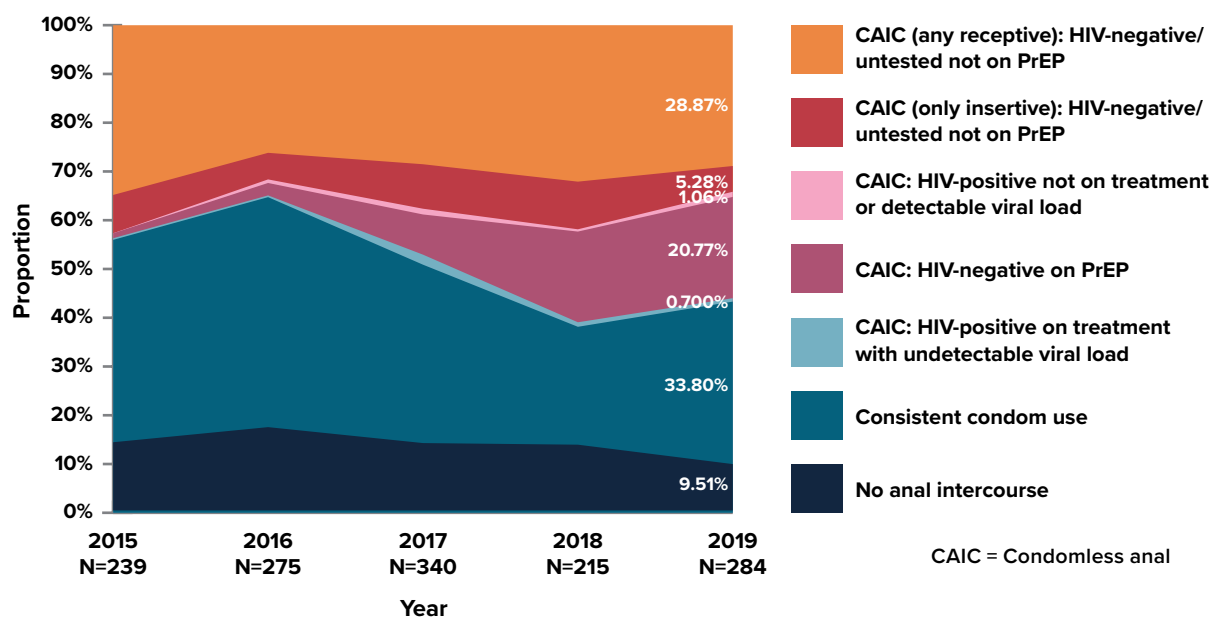
**Figure 43. Proportion of high risk men on PrEP, by age (the ACCESS network)**



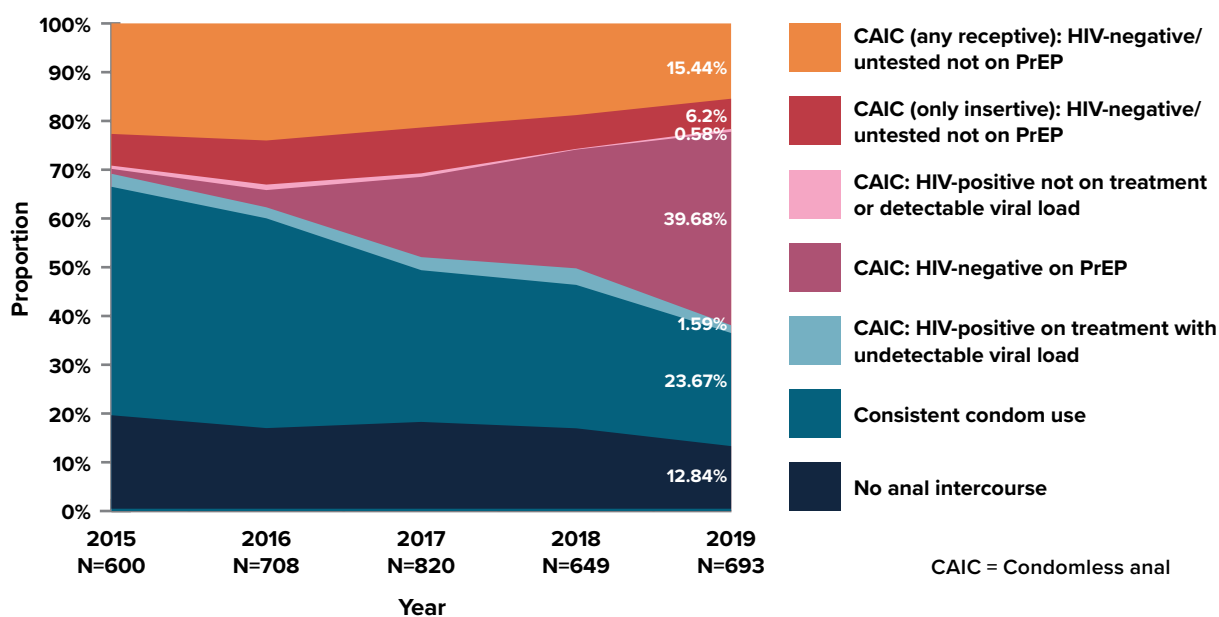
## F. Sexual risk reduction behaviour by age group

There were substantial differences in sexual risk reduction behaviours by age, which were largely driven by much lower levels of PrEP use in those aged less than 25. In 2019, the highest-risk categories below, representing HIV negative men having CAIC without protection from PrEP and HIV positive men having CAIC with detectable viral load, comprised 35.2% of those aged less than 25. It varied minimally, between 21% and 23%, in other age groups. In those aged 55 and older, PrEP use was lowest, but this was mostly offset by lower levels of anal intercourse, and a higher proportion of HIV positive men with UVL in this age group (Figures 42 to 48).

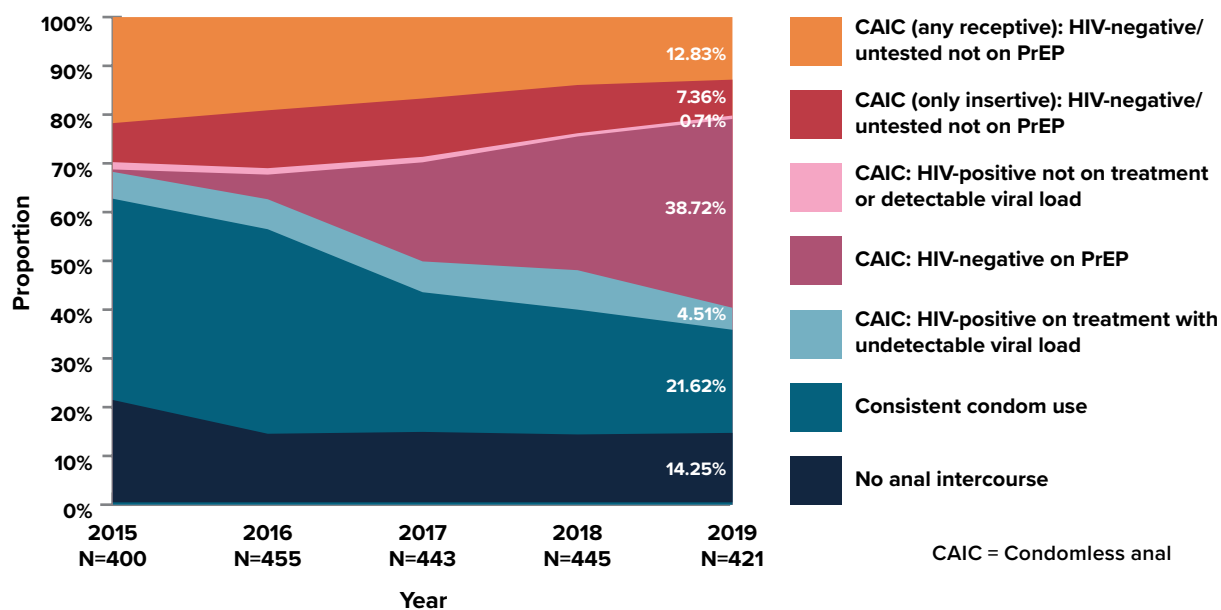
**Figure 44. Sexual risk reduction behaviour among GBMSM aged under 25 (Sydney GCPS)**



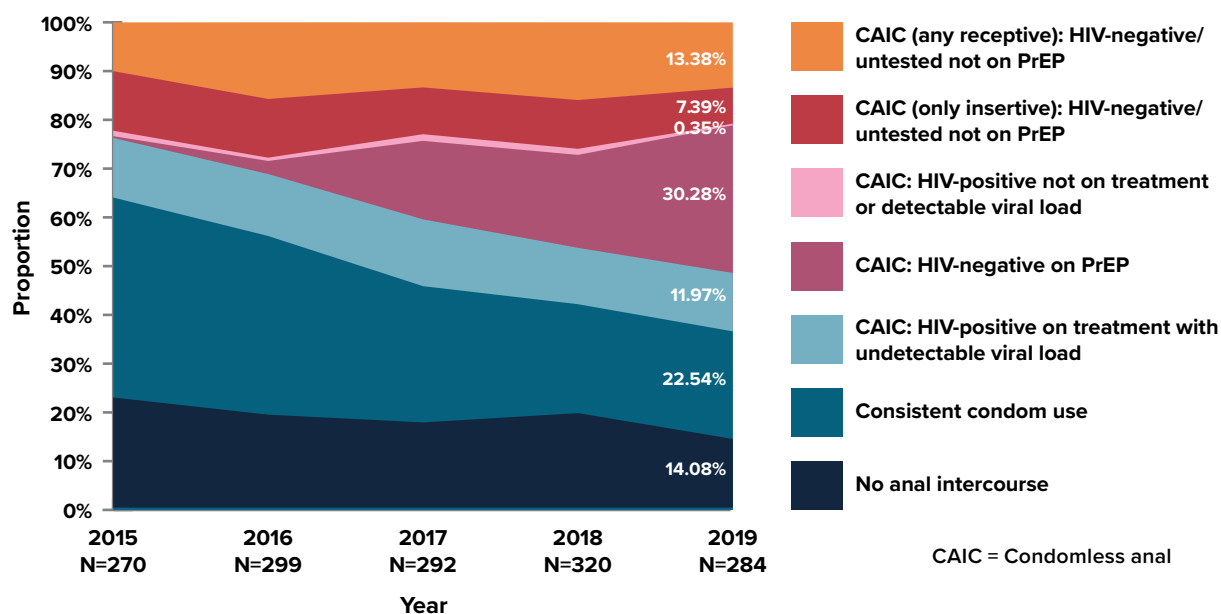
**Figure 45. Sexual risk reduction behaviour among GBMSM aged 25-34 (Sydney GCPS)**



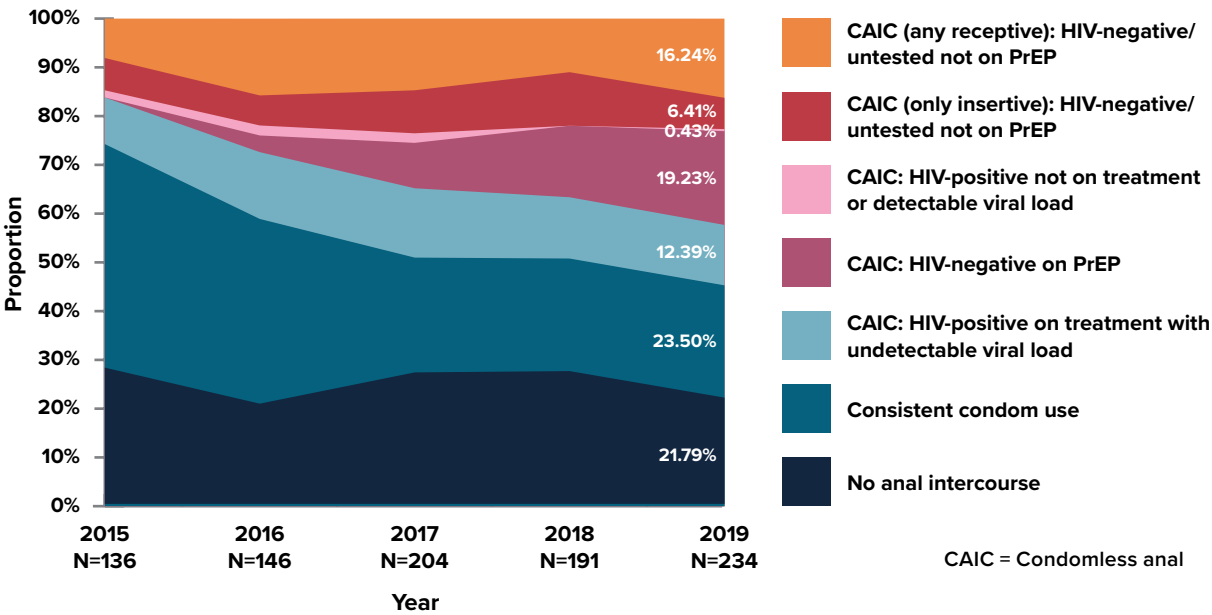
**Figure 46. Sexual risk reduction behaviour among GBMSM aged 35-44 (Sydney GCPS)**



**Figure 47. Sexual risk reduction behaviour among GBMSM aged 45-54 (Sydney GCPS)**



**Figure 48. Sexual risk reduction behaviour among GBMSM aged 55 and over (Sydney GCPS)**



# 5.

## Trends in HIV

in gay, bisexual and other men who have sex with men by sexual identity



Far fewer data were available on sexual identity than the other factors examined. Data on sexual identity is not currently available in ACCESS, but is included in the Sydney GCPS, with results on HIV testing, treatment and PrEP as outlined below.

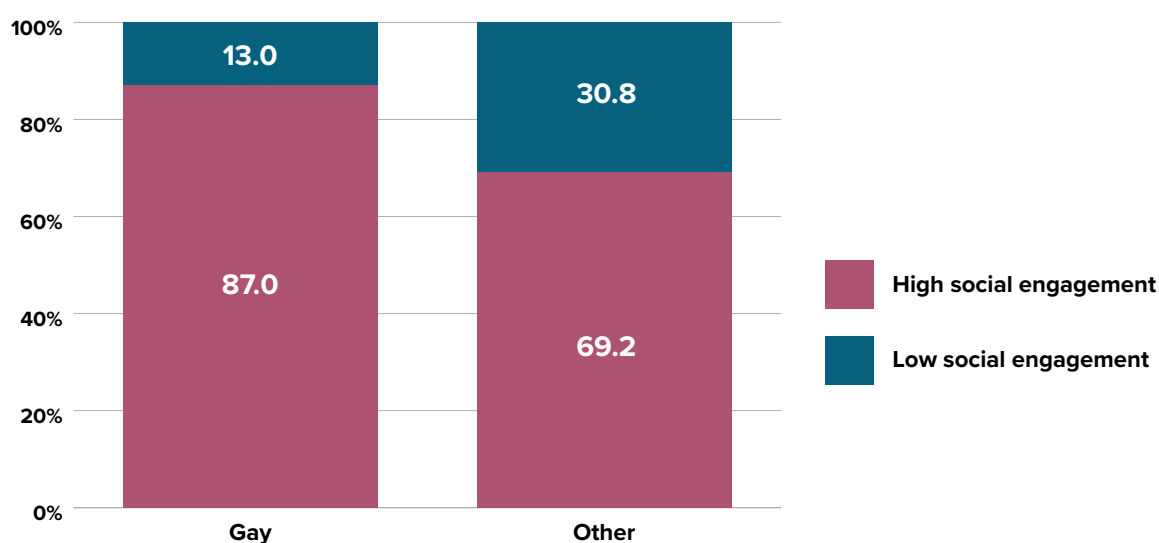
### A. Surveillance of HIV diagnoses by sexual identity

In HIV surveillance, data have traditionally been collected regarding HIV exposure history, such as “sex with person of same sex” rather than on sexual identity. There is limited understanding of the degree to which the data on sexual identity (i.e. gay versus bisexual/other) in transmission cases attributed to MSM transmission is meaningful. It was not examined at this meeting.

### B. Proportion of GBMSM with high or low gay social engagement by sexual identity

In the Sydney GCPS, men who identified as gay had much higher gay social engagement scores than men who reported bisexual, heterosexual or other identities (Figure 49). Nevertheless, more than two-thirds of those men who did not identify as gay had high gay social engagement scores. This likely reflects the gay community-focussed sampling scheme of the periodic survey.

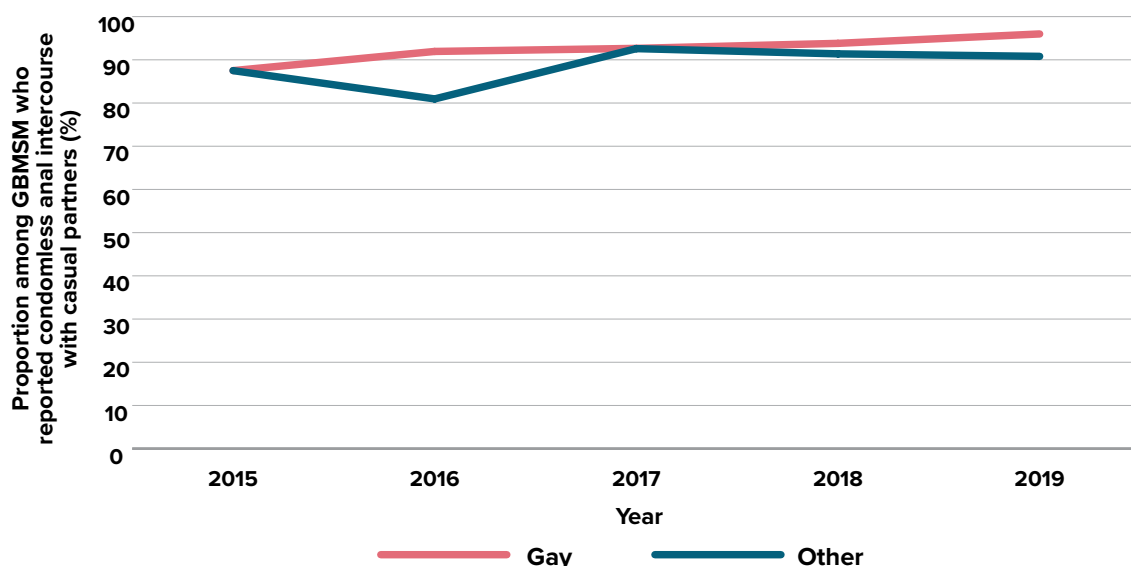
**Figure 49. Proportion of GBMSM with high or low gay social engagement by sexual identity (Sydney GCPS)**



## C. HIV testing rates by sexual identity

Among high-risk GBMSM recruited to the GCPS, testing rates are very only very slightly lower among non-gay identifying men (2-5% depending on the year, Figure 50).

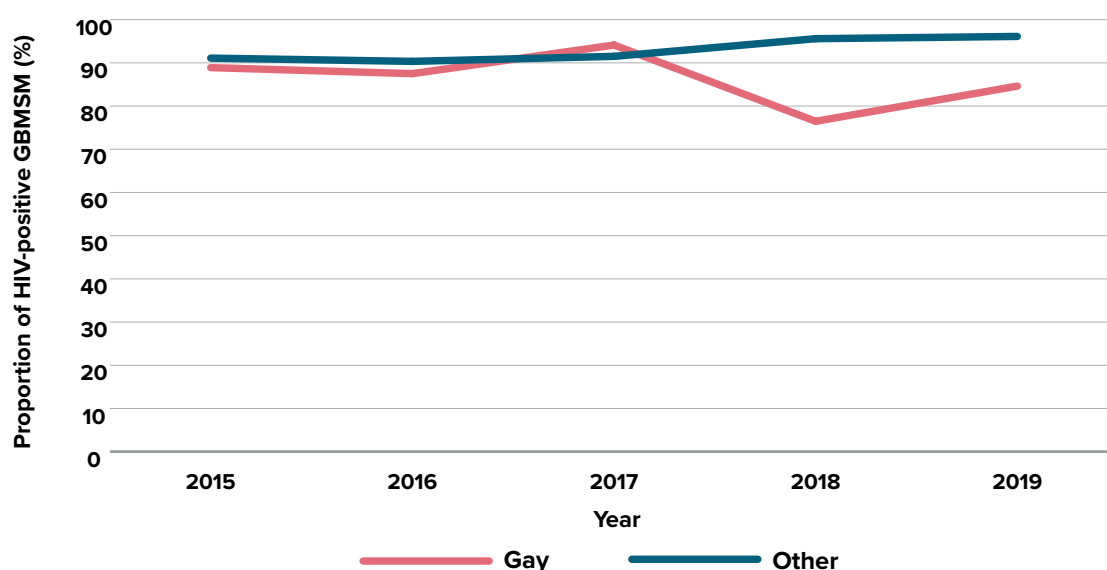
**Figure 50. Proportion of men who reported HIV testing in the last 12 months and some condomless anal intercourse with casual partners in the last 6 months by sexual identity (Sydney GCPS)**



## D. HIV treatment by sexual identity

Numbers of HIV positive non gay-identifying GBMSM were low. Based on small numbers, there was no consistent evidence that HIV treatment rates were consistently different by sexual identity in the GCPS (Figure 51). In 2019, based on 13 HIV-positive non-gay identifying GBMSM, 85% (11) had UVL.

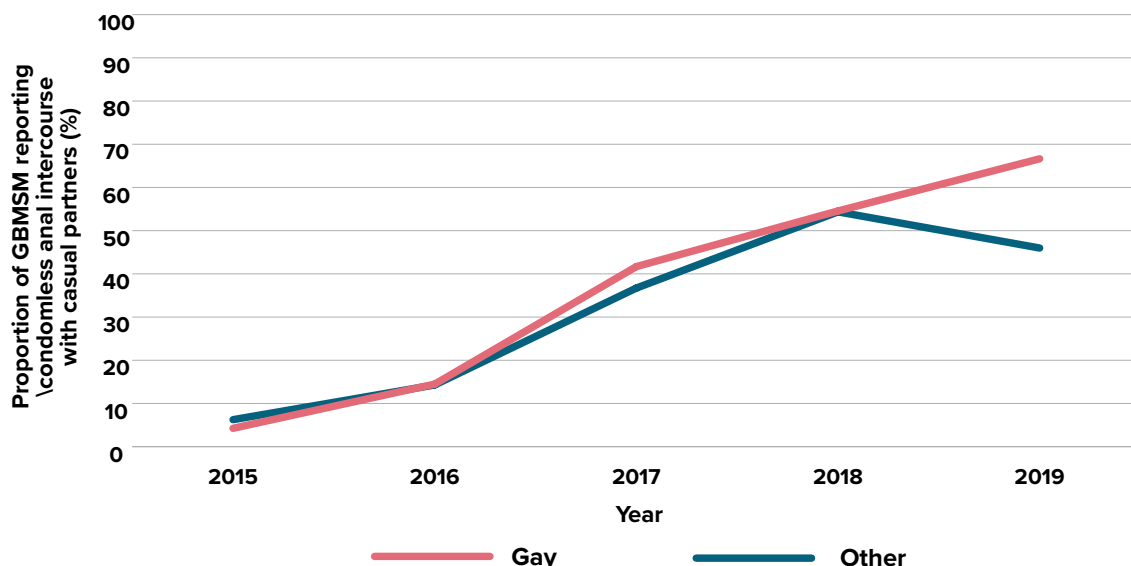
**Figure 51. HIV-positive men on treatment, by sexual identity (Sydney GCPS)**



## E. PrEP use by sexual identity

Use of PrEP did not differ by sexual identity in 2015-18, but in 2019 use of PrEP was lower in non-gay-identifying men based on 86 non-gay HIV-negative men who reported at least some condomless anal intercourse with casual partners in the last 6 months (Figure 52).

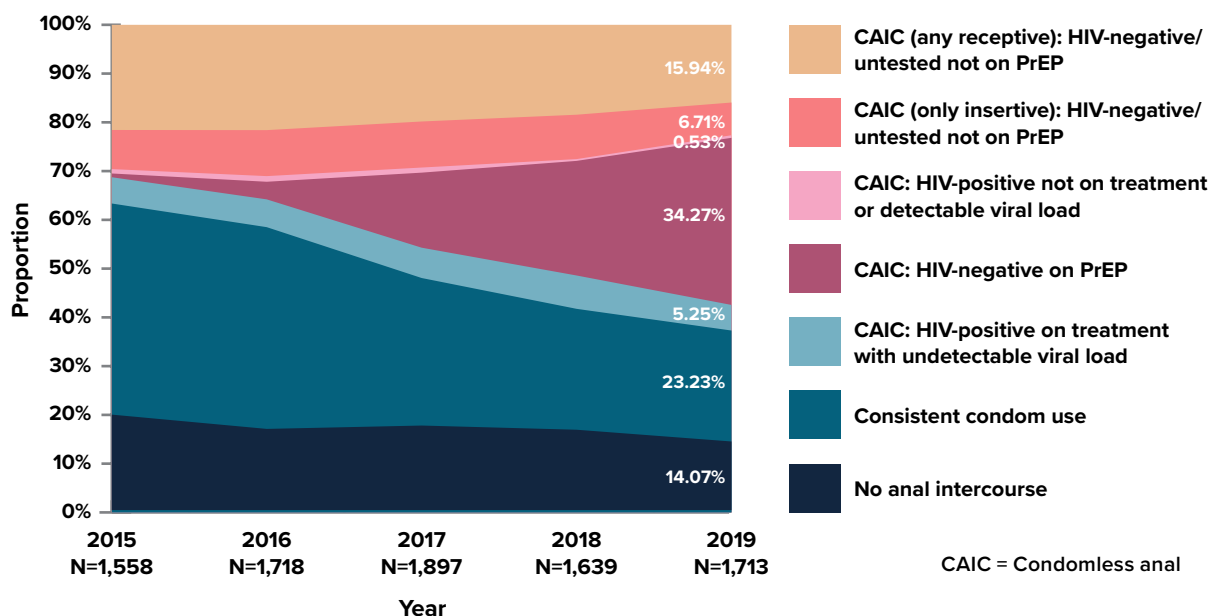
**Figure 52. Proportion of men who reported at least some CAIC in the last 6 months who reported PrEP use in the last 6 months, by sexual identity (Sydney GCPS)**



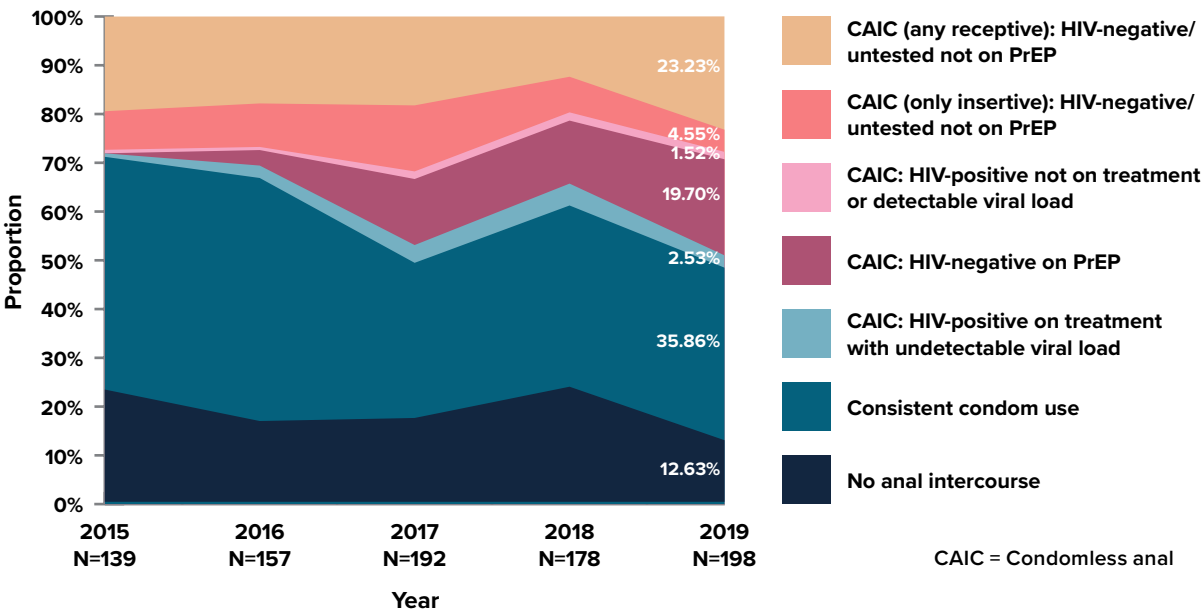
## F. Sexual risk reduction behaviour by sexual identity

There were substantial differences in sexual risk reduction behaviours by sexual identity, which were largely driven by much lower levels of PrEP use in the non-gay identified. In 2019, the highest-risk categories below, representing HIV-negative men having CAIC without protection from PrEP and HIV-positive men having CAIC with detectable viral load, comprised 29.3% of non-gay-identified men and 23.2% of gay-identified men (Figures 53 and 54).

**Figure 53. Sexual risk reduction behaviour among gay-identified men (Sydney GCPS)**



**Figure 54. Sexual risk reduction behaviour among non-gay-identified men (Sydney GCPS)**



# 6.

## Overlaps and intersections

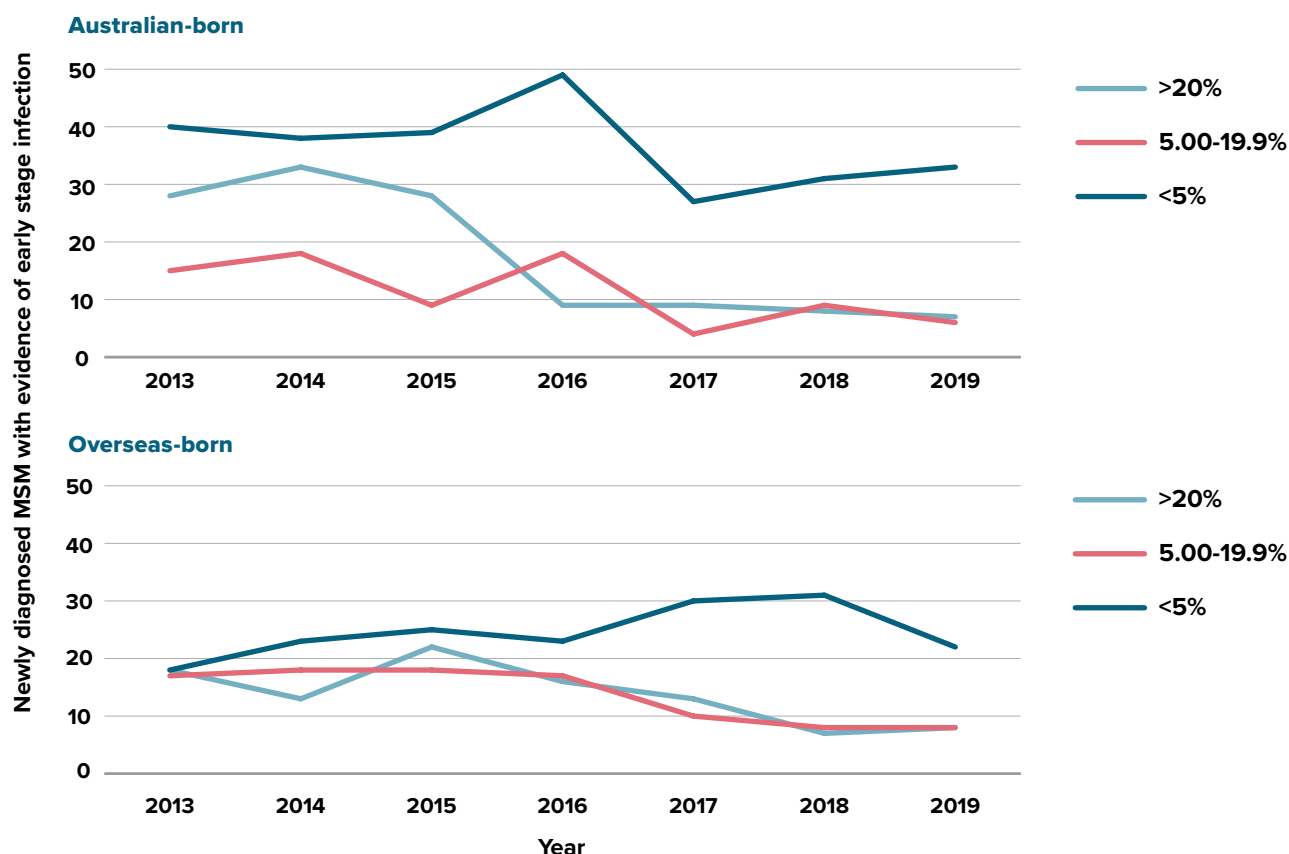
This analysis has identified striking variation in HIV trends by country or birth, area of residence and by age. Given these findings, we also examined whether there were particular patterns of interaction when two of these variables were considered at the same time. Given the previously documented differences between early and late infections, we have presented data for these two groups separately.

### A. Overlaps and intersections between country of birth and proportion of postcode gay

#### Surveillance data

**Trends in HIV diagnoses with evidence of early stage infection:** Among Australian-born MSM, the decreases in early stage HIV infection were 75%, 33% and 15% in the >20%, 5-19% and <5% suburbs respectively (Figure 55). Among overseas-born MSM, the decreases were 64%, 56% and 12% respectively. Thus, large declines were seen in the inner-city irrespective of country of birth. Among Australian-born MSM, early HIV infections declined in all areas, but the decline was lowest (15%) in the <5% postcodes. Among overseas-born MSM, early HIV infections declined in all areas and the decline was least in the <5% postcodes (12%).

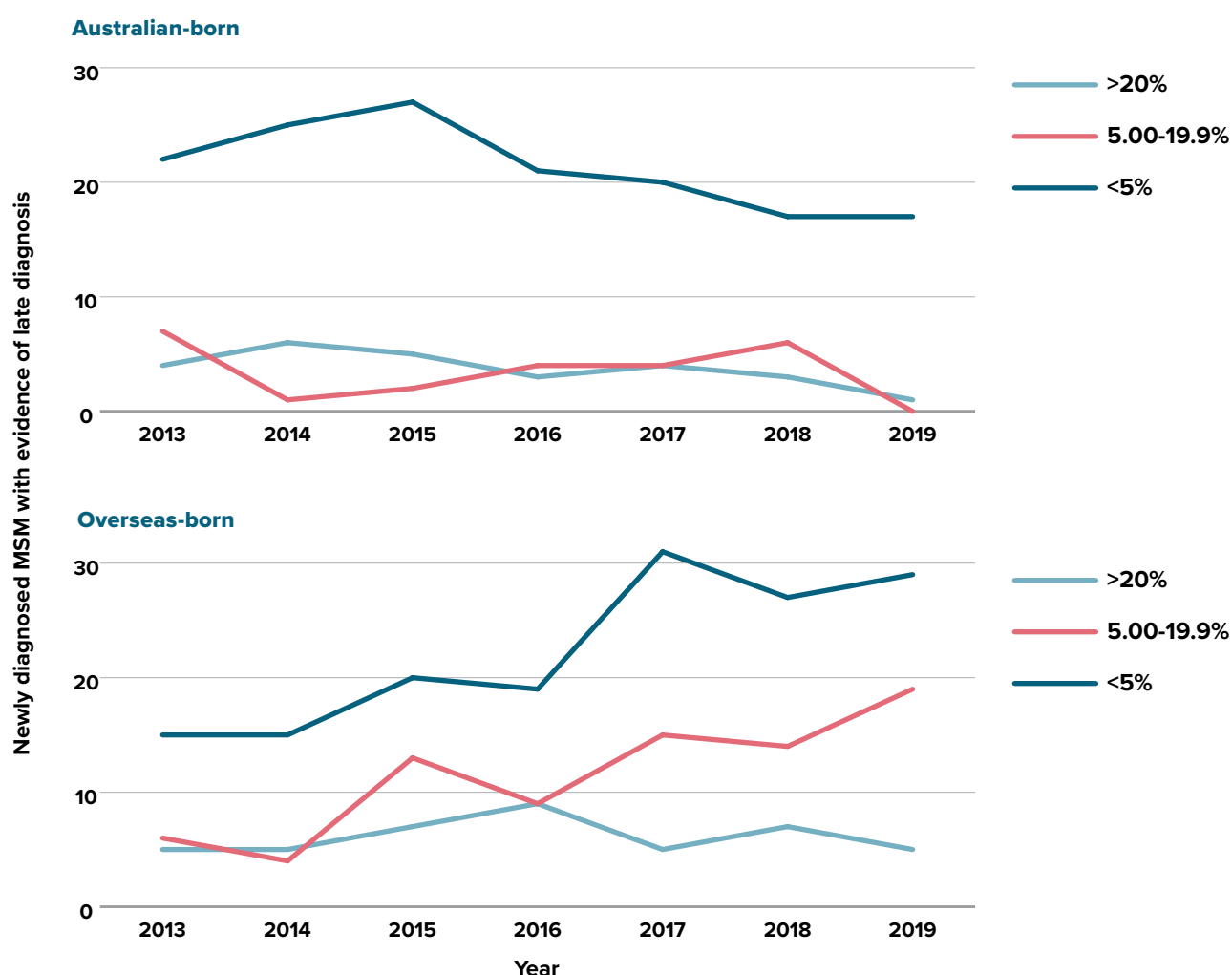
**Figure 55. New HIV notifications with evidence of early infection by area of residence, for (a) Australian-born MSM and (b) Overseas-born MSM.**



**Trends in HIV diagnoses with evidence of late diagnosis:** Among Australian-born MSM, late stage diagnoses were already uncommon in the gay suburbs in 2015, and declined further by 83%, 100% and 35% in the >20%, 5-19% and <5% suburbs respectively (Figure 56). In 2019, there was only 1 late diagnosis in an Australian-born MSM in a >5% gay postcode, demonstrating that late diagnosis has been almost eliminated from the gay suburbs in Australian-born men. Among overseas-born MSM, the changes were less consistent, of -30%, +133% and +65% in the >20%, 5-19% and <5% postcodes respectively.

Thus, for Australian-born MSM, decreases in late diagnoses occurred in all categories of area of residence. They are decreasing fastest and approaching elimination in the >20% and 5-19% gay suburbs, and declines were much smaller (35%) and from a higher base in the non-gay suburbs. For overseas-born MSM, in the >20% suburbs, decreases in late diagnoses are occurring although less than in Australian-born. In the 5-19% suburbs, early diagnosis is decreasing but late diagnoses increasing. In the <5% suburbs, increases in both early and late diagnoses are occurring in overseas-born men.

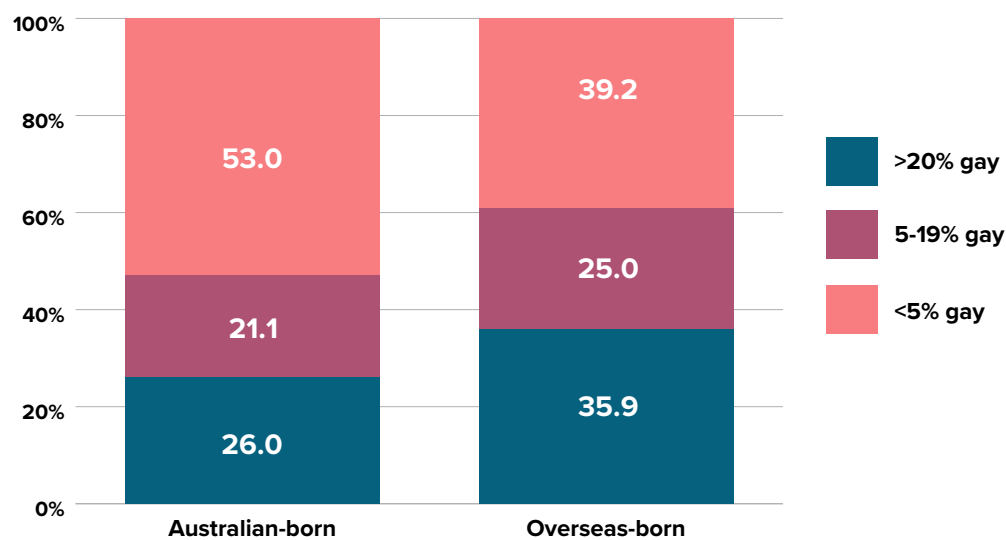
**Figure 56. New HIV notifications with evidence of late stage diagnosis by proportion of postcode who are gay, for (a) Australian-born MSM and (b) Overseas-born MSM.**



#### Country of birth and area of residence: overlaps and intersections in the Sydney GCPS

Interpretation of data from the GCPS on country of birth and areas of residence requires an understanding of the underlying data collection. Among Sydney GCPS respondents, overseas-born men are more likely than Australian-born men to live in the gay suburbs (both >20% and 5-19% suburbs). Conversely, 53% of the Australian-born, but only 39% of the overseas-born respondents resided in the <5% suburbs (Figure 57). While we have estimates of the distribution of the underlying population denominators of gay men across suburb categories, these data are not available stratified by country of birth.

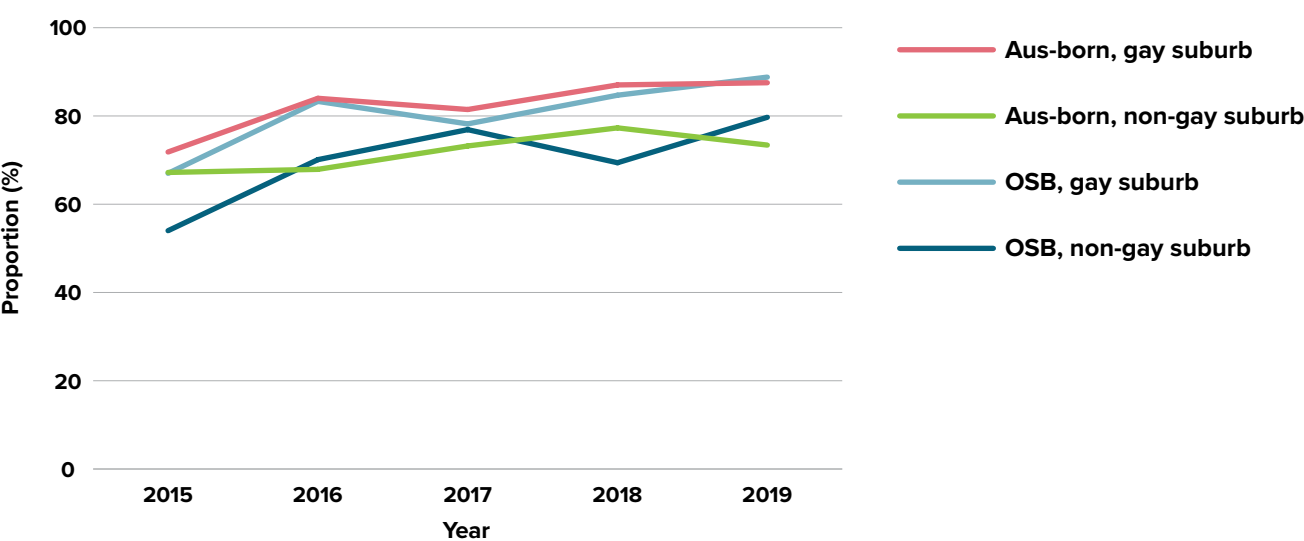
**Figure 57. Country of birth and area of residence in the Sydney GCPS (Sydney GCPS)**



**HIV testing data by country of birth and proportion of postcode gay**

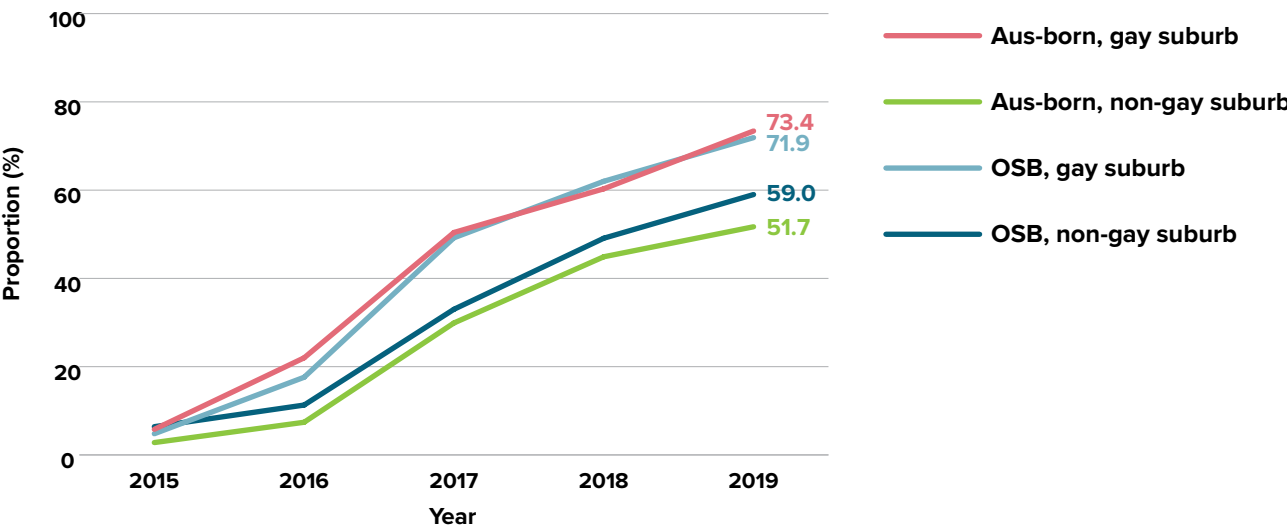
There were no strong patterns or interactions in HIV testing from the GCPS data. Less frequent HIV testing appeared to be more associated with living in less gay suburbs (i.e. suburbs where <5% of men were estimated to be gay) than being related to country of birth (Figure 58).

**Figure 58. Frequent HIV testing among men reporting CAIC (2 or more tests per year) by country of birth and residence in a gay suburb (Sydney GCPS)**



There were no strong patterns or interactions in HIV testing from the GCPS data. Less frequent HIV testing appeared to be more associated with living in less gay suburbs (i.e. suburbs where <5% of men were estimated to be gay) than being related to country of birth (Figure 58).

**Figure 59. PrEP use in men reporting CAIC in the last 6 months, by country of birth and residence in a gay suburb (Sydney GCPS)**

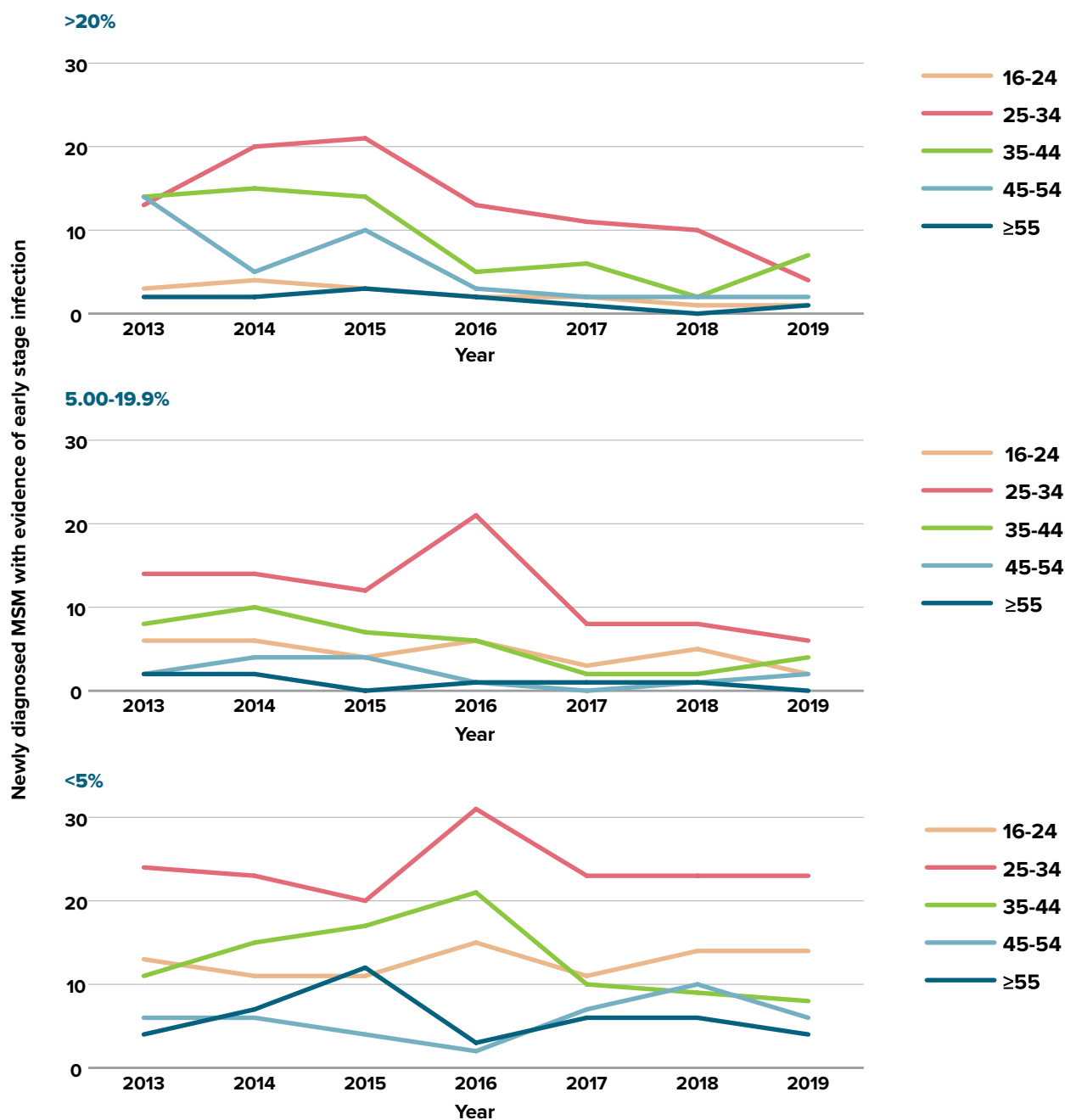


## B. Overlaps and intersections between age and proportion of postcode gay

### Surveillance data

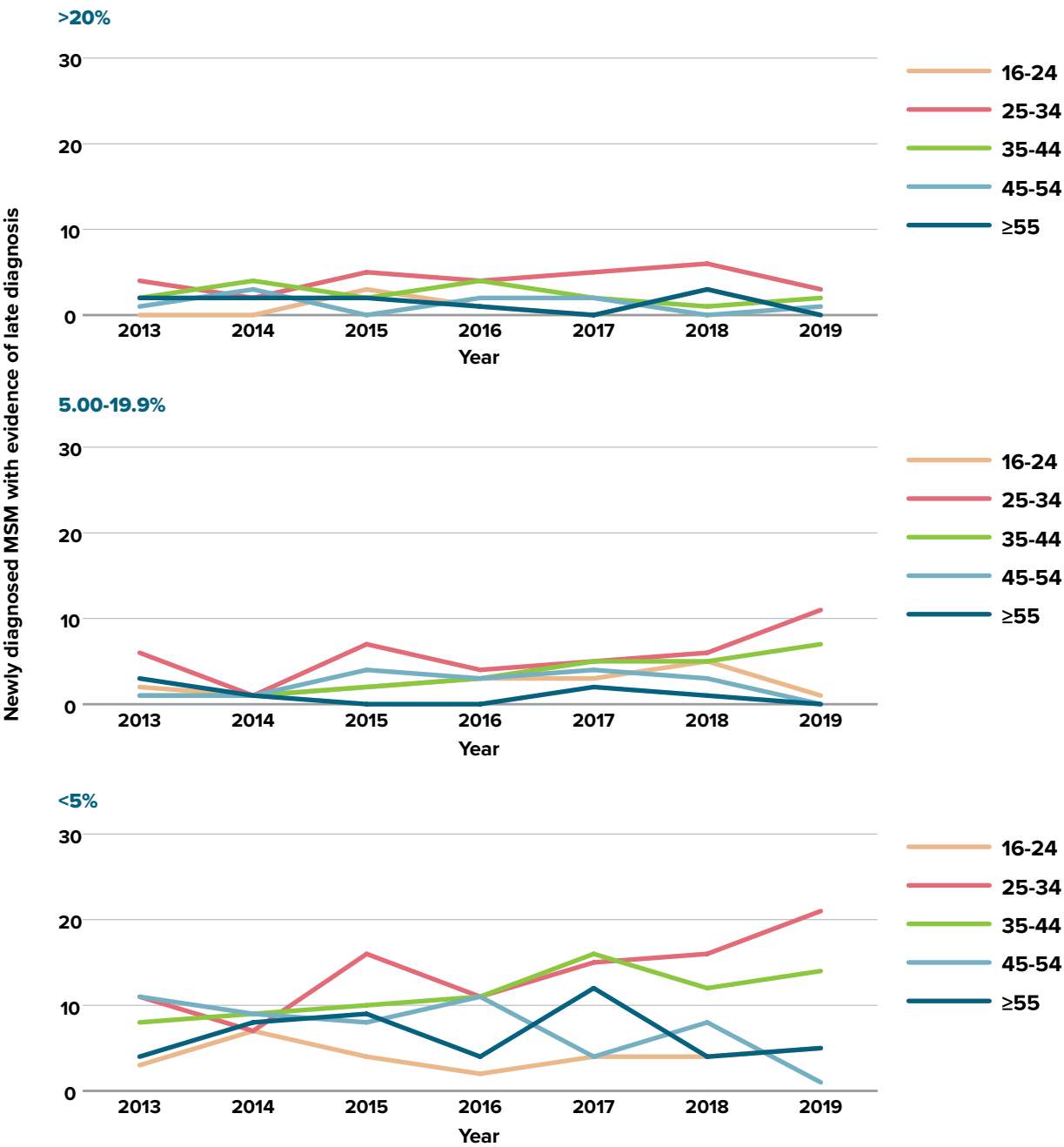
**Trends in HIV diagnoses with evidence of early stage infection:** HIV diagnoses with evidence of early infection decreased at all ages in the gay suburbs, with no strong differences by age (Figure 60). In the <5% suburbs, HIV diagnoses are roughly stable at all age groups.

**Figure 60. New HIV notifications among MSM with evidence of early stage infection by age group, and proportion of adult males in postcode who are gay**



**Trends in HIV diagnoses with evidence of late diagnosis:** Late diagnoses were uncommon in the >20% gay suburbs, regardless of age. In the 5-19% suburbs, late diagnoses increased in those aged 25-34 in 2019. In the <5% suburbs, late diagnosis was more common, with a recent increase, which was greatest in those aged 25-34 years (Figure 61).

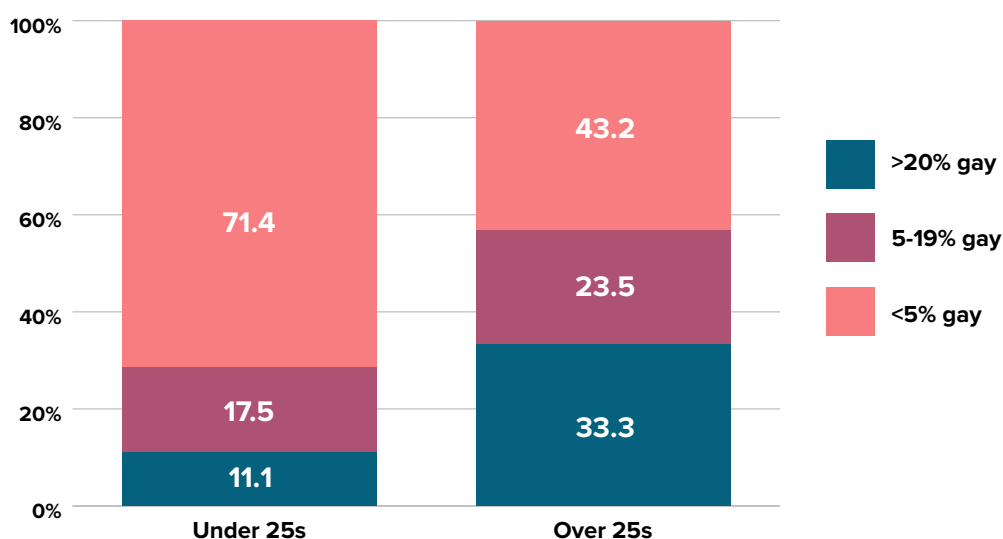
**Figure 61. New HIV notifications with evidence of late diagnosis by age group, for (a) Australian-born MSM and (b) overseas-born MSM by proportion of adult males in postcode group who are gay**



## Age and area of residence: overlaps and intersections in the Sydney GCPS

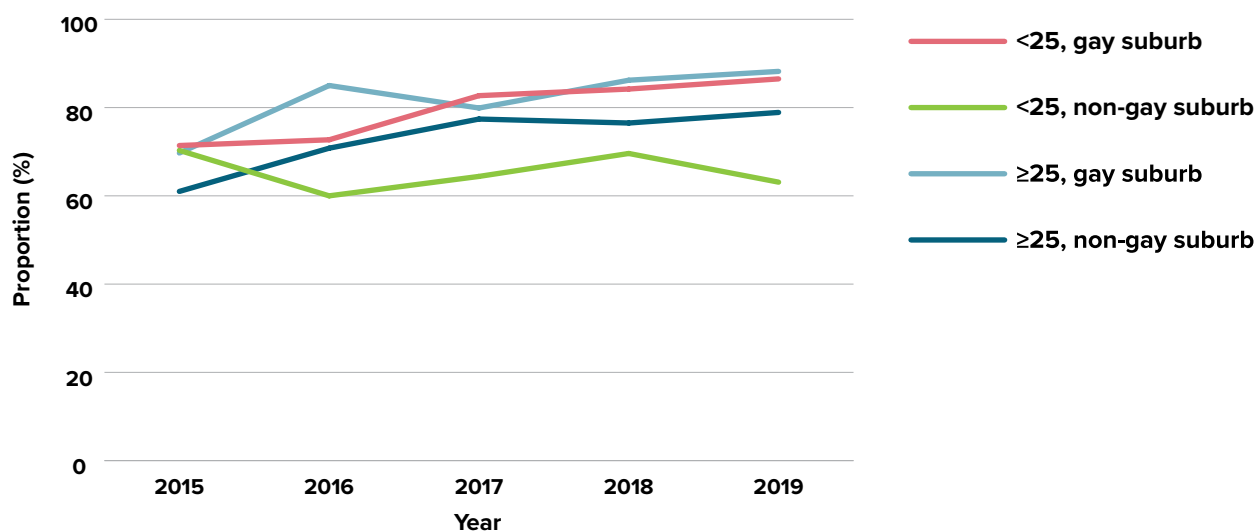
In the Sydney GCPS, young men aged less than 25 are much less likely to live in the >20% and the 5-19% suburbs (Figure 62). This may reflect economic factors such as the cost of accommodation in the inner suburbs of Sydney, and some people in this age group may still be living with their parents.

**Figure 62. Age and proportion of adult males in the postcode group who are gay in the Sydney GCPS (Sydney GCPS)**



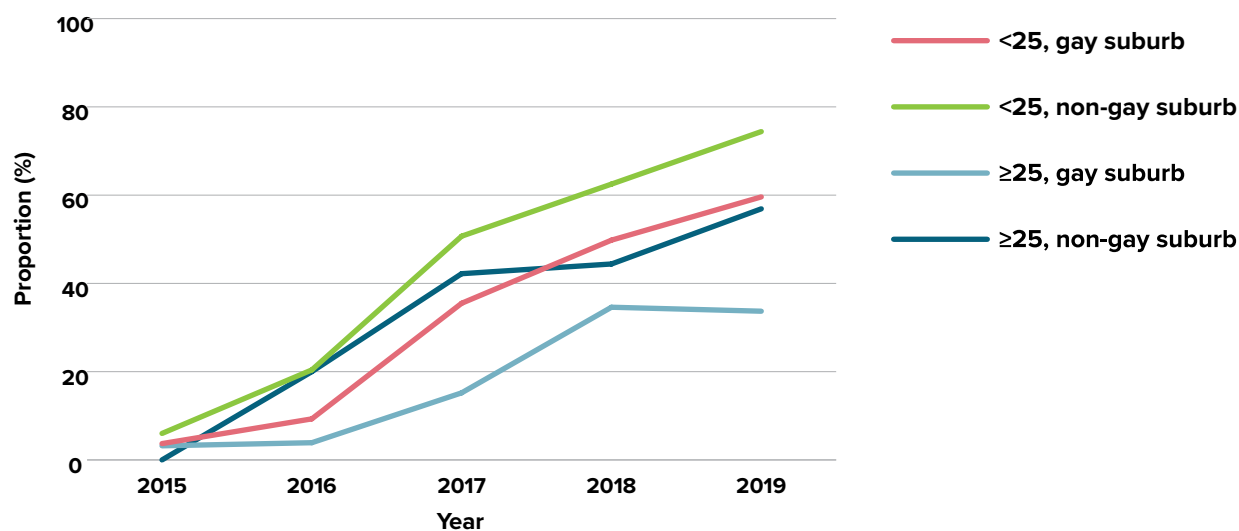
**HIV testing data by age and areas of residence:** Among GBMSM who reported CAIC in the last 6 months, HIV testing was lowest in those aged <25 years old living in non-gay suburbs (i.e. the suburbs where <5% of adult males are estimated to be gay) (Figure 63). Frequent testing (2+ times a year) has increased substantially in most groups of men, but has not increased at all in <25 year olds living in the non-gay suburbs.

**Figure 63. Proportion of men reporting 2 or more HIV tests in the last 12 months among men who reported CAIC in the last 6 months by age and residence in a gay suburb (Sydney GCPS)**



**PrEP:** PrEP use among high-risk GBMSM was lowest (34%) among young gay men living in non-gay suburbs in the GCPS data (suburbs where <5% of adult males are estimated to be gay) (Figure 64). It is highest among gay men aged >25 living in the gay suburbs.

**Figure 64. PrEP use among men who reported CAIC in the last 6 months by age and residence in a gay suburb (Sydney GCPS)**



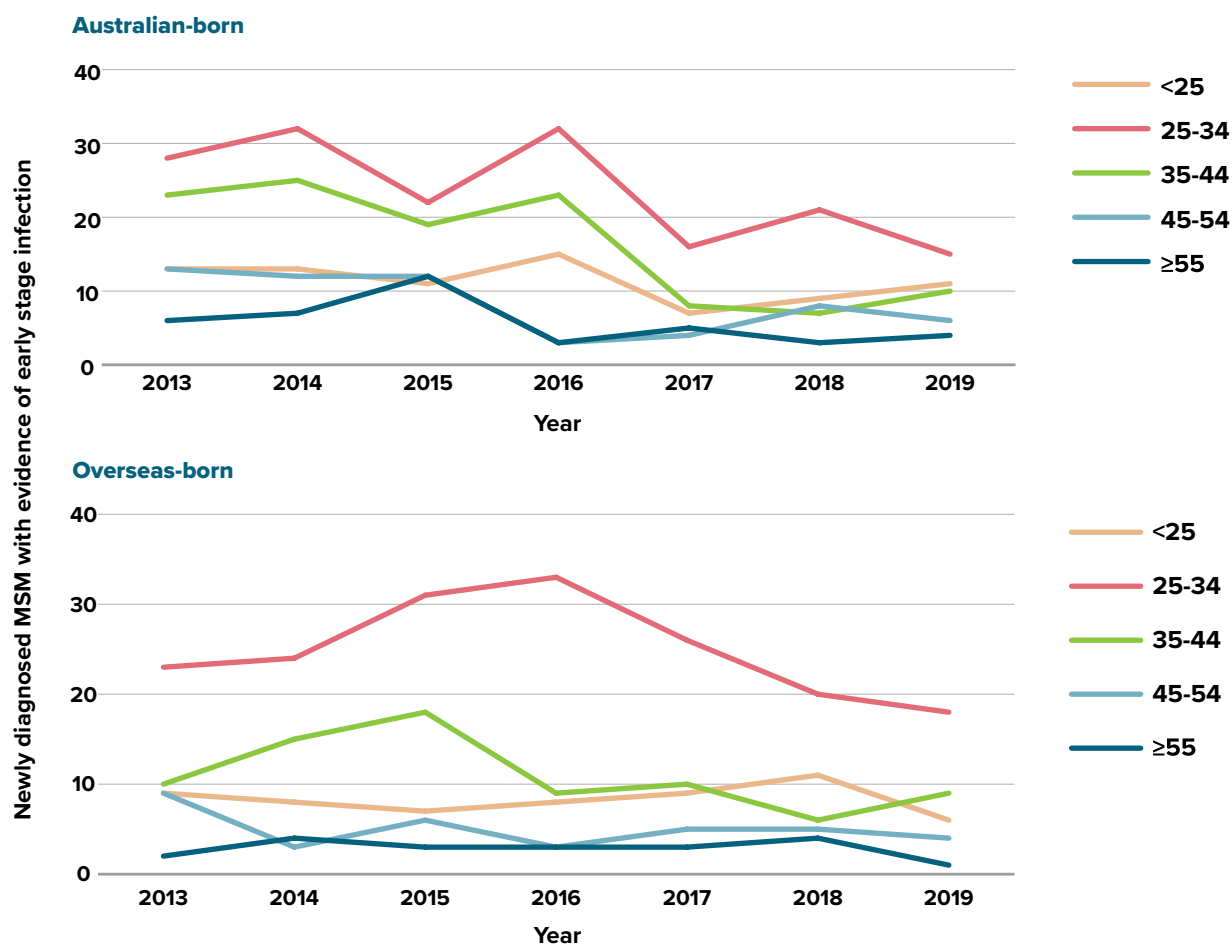
**Interpretation and implications:** The effects of young age and residing outside of the gay suburbs are rather additive, meaning that among high-risk GBMSM, the levels of frequent HIV testing, and of PrEP use, are lowest among those aged <25 in the non-gay suburbs. Interpretation is complicated by the fact that there are few young gay men who reside in the >20% suburbs.

## C. Overlaps and intersections between age and country of birth

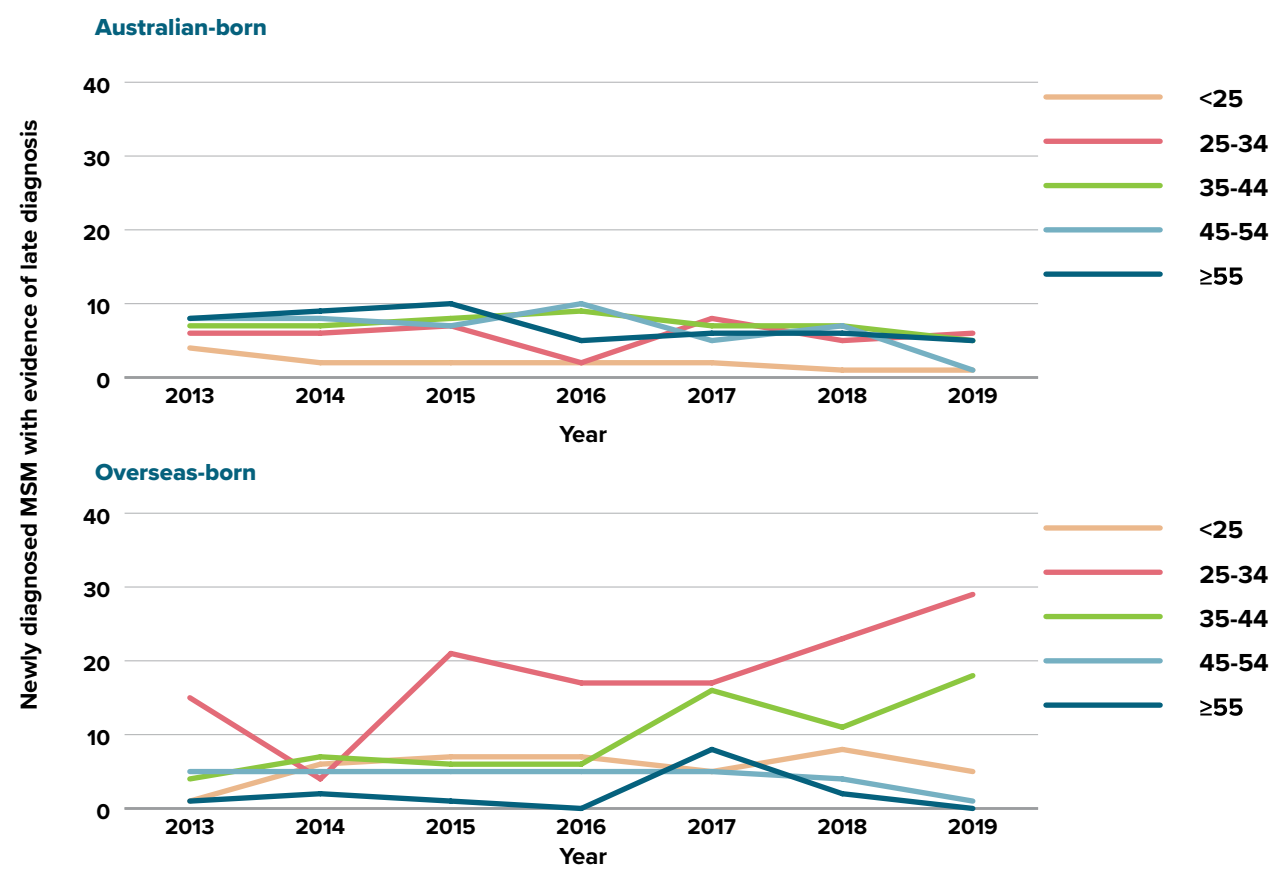
We were interested to examine whether the strong effects of country of birth varied by age.

**Surveillance data:** Early infections decreased at all ages in the Australian-born, and were mostly flat in the overseas-born (some decline in the 25-34 and 35-44 year olds, Figure 65). Late diagnoses decreased at all ages in the Australian-born, and increased at most ages in the overseas-born, with a particularly striking increase in those aged 25-44 (Figure 66).

**Figure 65. New HIV notifications with evidence of early infection by age group for (a) Australian-born MSM and (b) Overseas-born MSM**

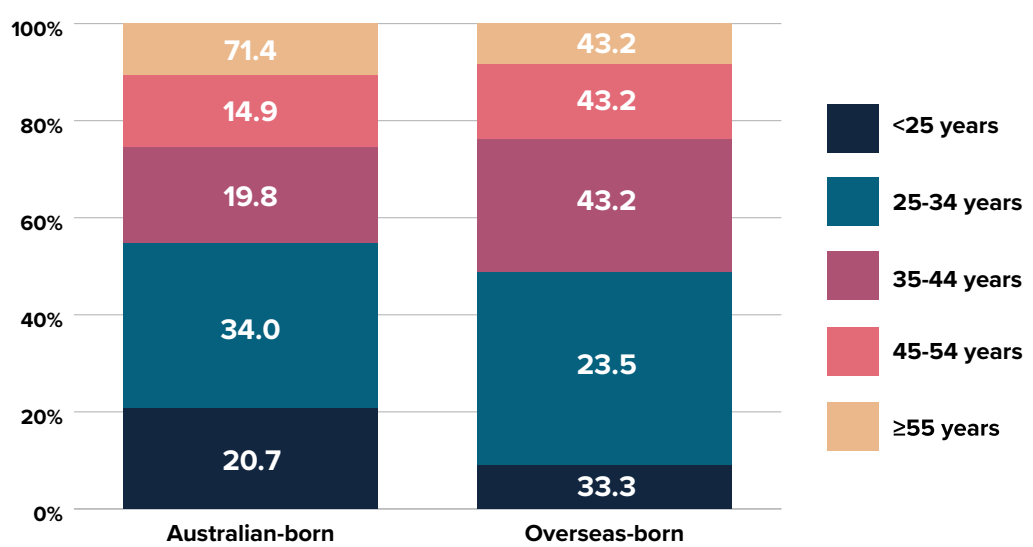


**Figure 66. New HIV notifications with evidence of late HIV diagnosis by age group for (a) Australian-born MSM and (b) Overseas-born MSM**



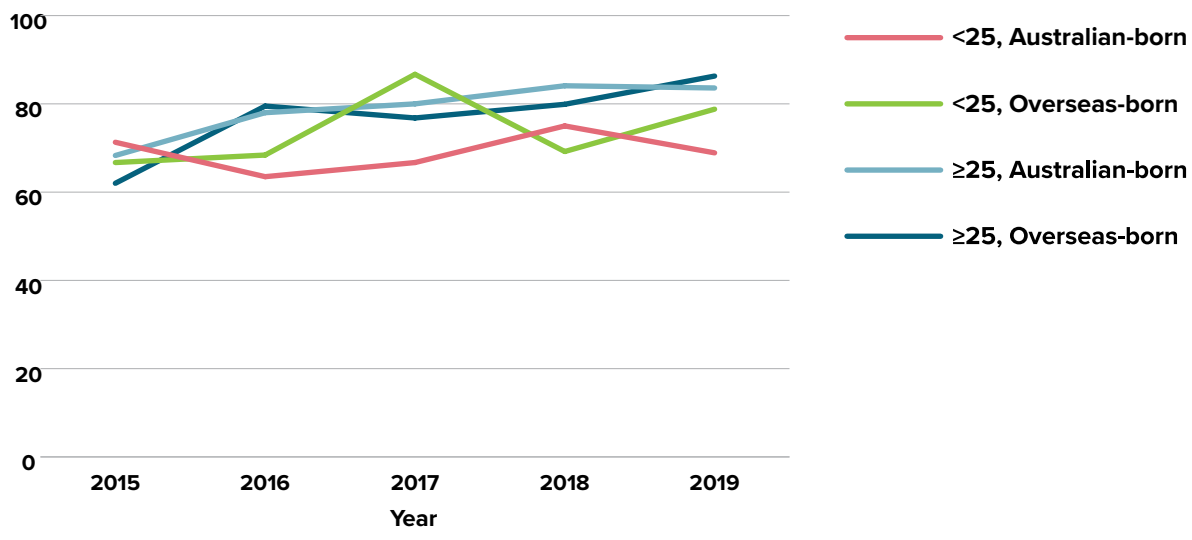
In the Sydney GCPS, overseas-born men were slightly less likely to be aged <25 and slightly substantially less likely to be 55 or older (Figure 67).

**Figure 67. Country of birth and age (Sydney GCPS)**



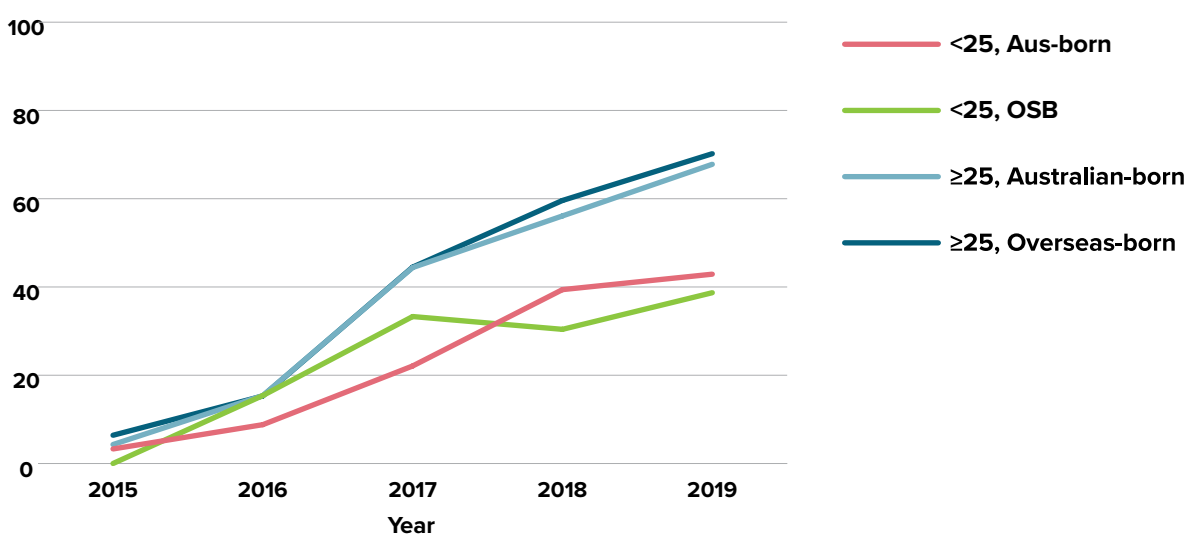
**Testing:** There were no strong patterns or interactions in the Sydney GCPS data on HIV testing, although the small numbers involved limit the scope to make meaningful comments about interactions (Figure 68).

**Figure 68. Proportion of men reporting 2 or more HIV tests in the last 12 months among men who reported CAIC in the last 6 months, by age and country of birth (Sydney GCPS)**



**PrEP use:** PrEP use was lower in young men, regardless of country of birth. PrEP use in overseas-born men aged > 25 was similar to PrEP use men in Australian-born men of the same age group in the GCPS (Figure 69).

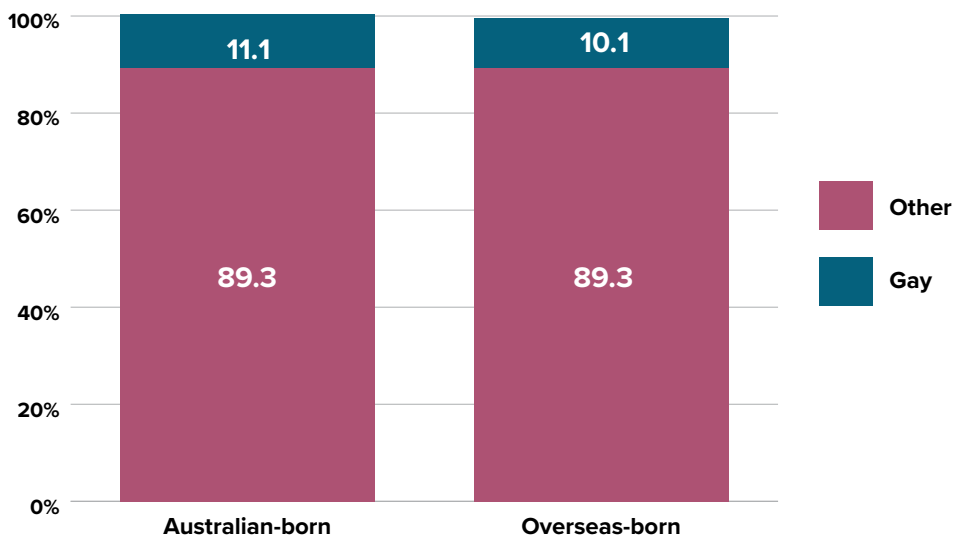
**Figure 69. The proportion of men using PrEP among men who reported CAIC in the last 6 months, by age and country of birth (Sydney GCPS)**



## D. Identity and country of birth in the GCPS

Levels of gay social engagement, and proportion identifying as gay, are very similar across different country of birth groupings. This suggests that the GCPS largely recruits socially engaged gay-identifying men regardless of country of birth (Figure 70).

**Figure 70. Country of birth by sexual identity in the GCPS**



# 7.

## Summary

### and interpretation of findings



In the context of a 40% decline in HIV diagnoses in MSM in NSW between 2015 and 2019 (*NSW HIV Strategy 2016 – 2020 Quarter 4 & Annual 2019 Data Report*) analyses presented in this report provide evidence of substantial variation within this success story in HIV prevention.

#### Country of birth

HIV incidence amongst overseas-born GBMSM, as indirectly measured by early stage HIV diagnoses, is decreasing in NSW, as rapidly as it is in the Australian-born, in whom the decline began before 2015. NSW has had substantial success in reducing HIV incidence in both the Australian-born and the overseas-born GBMSM.

In contrast to the similar patterns of decrease in diagnoses with evidence of early stage infection, there were substantial differences between Australian-born and overseas-born GBMSM with respect to HIV diagnoses with evidence of late stage diagnosis. In the Australian-born there was a 47% decline between 2015 and 2019, suggesting that the reservoir of the population with undiagnosed HIV was substantially declining over this period. In complete contrast, in the overseas-born GBMSM there was a 32% increase in diagnoses with evidence of late stage diagnosis. This increase was almost entirely due to a 57% increase in those who had arrived in Australia 4 or fewer years ago. The late stage of HIV infection at diagnosis makes it very likely that most of these infections were acquired before these men entered Australia. This strongly suggests that there is a need to improve early detection of HIV in people recently arrived and to immediately link them to care. Successful linkage to care would have the dual benefits of improved health to the individual and reduced onwards transmission. In our setting where the great majority of people living with HIV have undetectable viral load, undiagnosed HIV in people recently arrived presents an important transmission risk to other GBMSM who are not using condoms or PrEP. Fully addressing this issue is likely to require a range of preventive interventions.

Of particular importance to HIV prevention is linkage of recently-arrived GBMSM to local gay communities and to sexual health services. The data currently collected in these settings indicates that overseas-born men have similar levels of access to HIV prevention including HIV testing, HIV treatment, and PrEP as Australian-born men. This is promising but more needs to be done to enhance surveillance and reduce the divergence where some sub-populations of GBMSM are not benefiting from our success.

#### Area of residence

Recent work conducted by the NHPPP has highlighted striking findings according to areas of residence, and this is a rapidly emerging area of understanding of our HIV epidemic. Declines in HIV diagnoses were much greater in postcodes where we estimated >20% of adult males were gay (56% decline) compared to postcodes where fewer than 5% of adult males were gay (10% decline). Using estimates of the population denominator of gay men, crude rates of HIV diagnosis in gay men were highest in the >20% gay postcodes in 2015, but by 2019 crude rates were lower in the >20% gay postcodes than in the <5% gay postcodes. Since this remarkable reversal began in 2016, and rapidly evolved, it seems likely that widespread PrEP uptake may explain this.

There was a remarkable 70% decline in HIV diagnoses with evidence of early stage infection in the >20% gay postcodes, trending down to a 14% decline in the <5% gay postcodes. For diagnoses with evidence of late diagnosis, annual numbers of diagnoses in the >20% gay postcodes were already low in 2015, and they remained low. Late diagnoses were more common in the <5% gay postcodes, and they did not decline between 2015 and 2019.

Not surprisingly, the proportion of men with high gay social engagement is higher in those who live in the 'gayer' postcodes. Levels of HIV testing, and of PrEP access, were higher in men who lived in the gay postcodes, although treatment levels in the HIV positive was similarly high across postcode groupings. The difference in PrEP access is particularly concerning. Among men who reported condomless anal intercourse with casual partners in the past 6 months, 74% of those in the >20% gay postcodes reported PrEP use, compared to 54% in the less than 5% gay postcodes.

These data suggest that we need to target increased HIV prevention services, including improved access to PrEP and increased HIV testing, to GBMSM living outside of the gay suburbs. At the same time, the successes in the gayest suburbs need to be maintained and strengthened. Analysis of diagnoses by gay suburb residence is an important new tool in tracking the epidemic in New South Wales. Our use of data based on area of residence is still developing, and more work needs to be done on how to use this information most effectively in monitoring and evaluation and in guiding new prevention and treatment approaches.

## Age

Between 2015 and 2019, there were declines in HIV diagnoses with evidence of early stage infection among all groups, but the decline was lower (6%) among men aged under 25 compared to other decadal age groups (38-67% declines). However, numbers in the under 25 category were relatively small (32 in 2019) so these results, while of concern should not be over-interpreted. There were declines in diagnoses with evidence of late diagnosis in the majority of age groups, but in contrast there were substantial increases in men aged between 25 and 44. These increases were entirely related to the increases in late diagnoses in the overseas-born that are noted above.

Men aged less than 25 were slightly less likely to report recent HIV testing, and in those reporting condomless anal intercourse with casual partners in the last 6 months, they were substantially less likely to report PrEP use (42%, compared to 73% in those aged 35-44). Because they were less likely to be taking PrEP, they were substantially more likely to report condomless anal intercourse with casual partners that was not protected by PrEP and posed a risk of HIV transmission. These are concerning signs of HIV vulnerability.

We need targeted programs to increase PrEP acceptability, access and use among young high-risk GBMSM.

## Sexual identity

Reliable HIV surveillance data that includes sexual identity are not currently available. Planning is underway to commence collection of sexual identity in HIV surveillance soon, and these data could potentially be of great benefit in understanding the pattern of HIV infection in NSW. This report has focused on the GCPS as it is one of our only ongoing repeated data collection system which collects data on sexual identity. In interpreting the GCPS, it is important to consider that the data collection is largely conducted at gay events and venues, supplemented by online recruitment. Nevertheless, these data show that non-gay-identifying GBMSM have lower levels of social engagement with gay men than gay-identifying men. This is a relatively small group, with annual data available on fewer than 200 men, mostly identifying as bisexual, each year. PrEP uptake for those at higher risk was lower among non-gay-identifying men.

Given the small numbers of non-gay-identifying men included in current research, caution should be taken in extrapolating these results. The lack of data on gay/non-gay identity in HIV surveillance is problematic and requires further investigation and development. Further information on HIV transmission in non-gay-identified GBMSM is important and would likely influence education and prevention campaigns, particularly as they relate to the <5% postcodes and overseas-born men. New research approaches to study recruitment will be required.

## How do these categories overlap?

It is important to note first that an analysis of the overlap of these categories leads to relatively small numbers. It is also important to consider the overlaps that are likely the result of population-level demographic confounding effects. In the GCPS, overseas-born men are more likely than Australian-born to live in the gay suburbs, and conversely the Australian born are more likely to reside in the <5% suburbs. Young gay men aged less than 25 are much less likely to live in the Sydney gay postcodes, probably related to cost of accommodation and the fact that many young adults still live with their parents.

Consistently, in the GCPS data, country of birth appeared to be less strongly associated with access to HIV prevention services such as HIV testing and PrEP access than did postcode of residence and age, but this may reflect the underrepresentation of overseas-born and men disengaged from gay networks in the GCPS. Certainly, surveillance data demonstrate the importance of ensuring overseas-born gay men have good access to HIV prevention services. The combination of postcode and age was particularly striking. For example, the uptake of PrEP among high risk GBMSM varied from 34% in young men aged <25 living in a non-gay suburb to 74% in men aged older than 25 living in a gay suburb.

Some extraordinary successes in HIV prevention are revealed in some categories of overlap, such as the 75% reduction in HIV diagnoses with evidence of early stage infection, and the near elimination of late diagnosis, in Australian-born MSM living in the >20% postcodes.

## Conclusion

Within the evolving success story of HIV prevention in GBMSM in New South Wales, some important sub-populations for targeting have been identified in this analysis. A consideration of these results by health policy makers, community advocates and other partners, including researchers, should help ensure that a new HIV strategy can lead to even greater successes in HIV prevention and accelerate the progress towards elimination and widen its benefits to more people.

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