

# The changing age distribution of men who have sex with men diagnosed with HIV in Victoria

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**H**IV diagnoses declined in Australia during the 1990s, only to increase again through the 2000s, with men who have sex with men (MSM) continuing to be the group at greatest risk. Increased rates of HIV diagnosis have been greater in Victoria than in other states.<sup>1,2</sup> Multiple factors are thought to be contributing to this increase, including increased rates of unprotected anal intercourse among MSM,<sup>3</sup> an increase in other sexually transmitted infections (STIs) that facilitate HIV transmission,<sup>4,5</sup> and increased numbers of sexually active HIV-positive MSM since the introduction of highly active antiretroviral treatment (HAART).<sup>6</sup>

Over the years, there has been an increase in the age at HIV diagnosis among MSM in Victoria,<sup>7</sup> as would be expected given reported similarities in age within MSM sexual networks.<sup>8</sup> Despite this trend, there has been ongoing concern about the potential risk of acquiring and transmitting HIV among younger MSM because, compared with older MSM, they have less frequent testing for HIV and STIs<sup>9</sup> and are less likely to know their HIV status and that of their partner.<sup>10,11</sup>

In this article we report on recent trends from Victorian passive HIV surveillance and the Victorian Primary Care Network for Sentinel Surveillance (VPCNSS) that suggest younger MSM in Victoria are at increasing risk of HIV infection.

## METHODS

### Victorian passive HIV surveillance

HIV infection is a notifiable disease in Australia. Passive HIV surveillance is enhanced by the collection of the following information based on patient self-report: the most likely route of exposure, most likely place the infection was acquired, clinical characteristics (symptoms, CD4 count), reason for the test; and HIV testing history (date, location and result of the previous HIV test).

### Victorian Primary Care Network for Sentinel Surveillance

The VPCNSS is a network of clinical sites participating in the surveillance of HIV, syphilis, chlamydia and/or hepatitis C.<sup>12</sup> The HIV network sites include sexual health

## ABSTRACT

**Objective:** To describe recent trends among men who have sex with men (MSM) in age at diagnosis of HIV in Victoria.

**Design and setting:** Analysis of Victorian HIV surveillance data from (i) passive surveillance (2000–2009) and (ii) the Victorian Primary Care Network for Sentinel Surveillance (VPCNSS) (2006–2009). Age-trend comparisons were made using syphilis and gonorrhoea enhanced surveillance.

**Main outcome measures:** HIV diagnoses, HIV testing and behavioural indicators by year and age group among MSM.

**Results:** Following a period of sustained increase between 2000 and 2007, the median age at HIV diagnosis among MSM declined significantly, from 38.8 years in 2007 to 35.3 years in 2008 ( $P=0.023$ ), remaining at 35.9 years in 2009. Between 2007 and 2008, the median age of syphilis and gonorrhoea notifications also declined, from 40.6 to 36.0 years and from 32.3 to 29.3 years, respectively. The median age of HIV testing among MSM in the VPCNSS population remained constant between 2006 and 2009, at 33.0 years. Compared with older MSM, those aged less than 35 years were more likely to have never previously been tested for HIV (relative risk [RR], 1.36 [95% CI, 1.30–1.41]); to not know the HIV status of their regular partner (RR, 1.11 [95% CI, 1.01–1.21]); and to report inconsistent condom use with casual partners (RR, 1.07 [95% CI, 1.01–1.14]) and regular partners (RR, 1.07 [95% CI, 1.00–1.14]).

**Conclusions:** Younger MSM in Victoria may be at increasing risk of HIV infection. Enhanced methods of monitoring HIV and sexually transmitted infection transmission in younger MSM are needed, as well as prevention messages to target this group, who may not fully understand their HIV risk.

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and gay men's health clinics with a high case load of MSM. These sites notified about 52% of all new HIV diagnoses in Victoria in 2008 (unpublished data, Burnet Institute, 2010). Demographic and risk behaviour information are collected from MSM undergoing routine testing for HIV and linked with their test result using a unique identifier.

### Syphilis and gonorrhoea surveillance

Syphilis and gonococcal infections are notifiable diseases in Victoria. Enhanced surveillance of notified infectious syphilis (acquired <2 years previously) and gonococcal infections is voluntary and includes self-reported risk factor data such as gender of sexual partner, source and probable place of infection.

### Analysis

Victorian passive HIV surveillance data (2000–2009) on cases reporting male-to-male sexual contact as the sole exposure to

HIV were analysed. A "recently acquired" HIV infection was defined as an HIV diagnosis after a negative HIV test within the previous 12 months or a seroconversion illness in the previous 12 months. These data were supplemented by Victorian passive surveillance data on age trends in infectious syphilis (2004–2009) and gonorrhoea (1999–2008).

Self-reported data on MSM from the VPCNSS HIV network between April 2006 and June 2009 were analysed to determine trends in age at HIV test and differences in risk behaviours between age groups.

The Mann–Whitney  $U$  test was used to assess difference in age at HIV diagnosis between two reporting years, and linear regression was used to investigate long-term age trends. Differences in VPCNSS risk characteristics between age groups were assessed using univariate logistic regression. All analyses were conducted using Stata software, version 10 (StataCorp, College Station, Tex, USA).

RESULTS

HIV passive surveillance, 2000–2009

Between 2000 and 2009, 1635 MSM were diagnosed with HIV in Victoria. The median age of MSM at HIV diagnosis increased steadily from 34.5 years (range, 19.1–64.5 years) in 2000 to 38.8 years (range, 19.2–70.5 years) in 2007 ( $P=0.001$ ), then declined significantly to 35.3 years in 2008 (range, 17.0–75.2 years) ( $P=0.023$ ) and remained at 35.9 years (range, 17.5–78.5 years) in 2009 (Box 1). Between 2007 and 2008, HIV notifications among MSM increased in all age groups under 35 years and decreased in all age groups between 35 and 49 years. In 2009, the number of HIV

diagnoses among MSM aged 25–29 years was 62% higher than in 2007 (Box 2).

Between 2000 and 2009, 41% of the total HIV diagnoses among MSM were recently acquired infections. The annual median age of MSM diagnosed with recently acquired HIV ranged between 29.8 years (range, 19.1–57.0 years) in 2000 and 36.5 years (range, 18.6–62.8 years) in 2006. By 2009, the median age of MSM diagnosed with recently acquired HIV infections had declined to 31.6 years (range, 18.9–78.5 years) ( $P=0.027$  for difference between 2006 and 2009) (Box 1).

VPCNSS data, 2006–2009

The VPCNSS recorded 16 619 HIV tests among MSM between April 2006 and June

2009. The median age of MSM testing for HIV remained constant (33.0 years), and the median age of MSM testing positive for HIV did not change significantly (37.2 years in 2006; 34.8–34.9 years in 2007–2009).

Based on recent HIV passive surveillance data showing that MSM diagnoses increased in all age groups under 35 years, we dichotomised VPCNSS patients into two age groups (<35 years and  $\geq 35$  years) and compared behavioural data across the two groups. Compared with MSM aged 35 years and over, MSM aged under 35 years were more likely to have never previously been tested for HIV (relative risk [RR], 1.36 [95% CI, 1.30–1.41]); to report not knowing the HIV status of their regular partner (RR, 1.11 [95% CI, 1.01–1.21]); and to report inconsistent condom use with casual partners (RR, 1.07 [95% CI, 1.01–1.14]) and regular partners (RR, 1.07 [95% CI, 1.00–1.14]). Among sexually active MSM, those aged 35 years and over were less likely to report having more than five sexual partners in the previous 6 months (RR, 0.91 [95% CI, 0.85–0.97]) (Box 3).

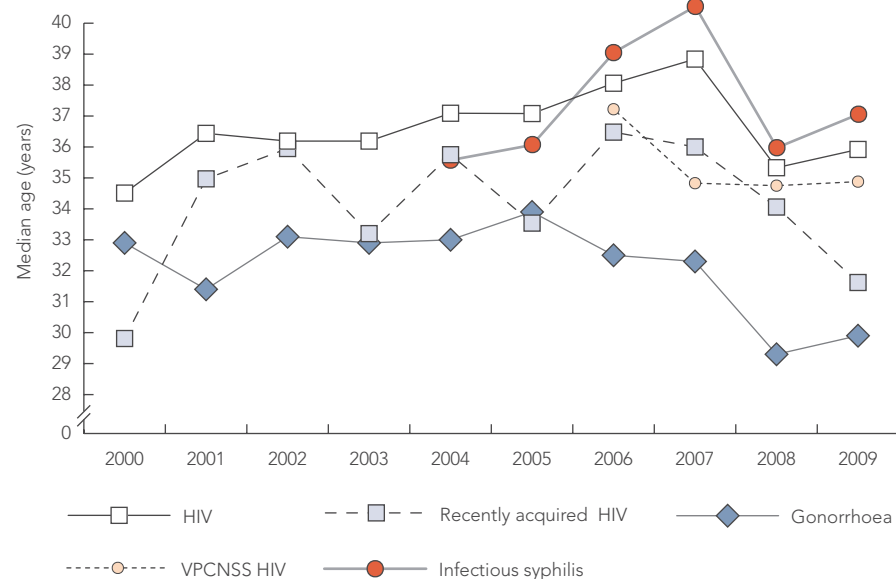
Syphilis surveillance, 2004–2009

Between 2004 and 2009, 1313 infectious syphilis cases were diagnosed among MSM in Victoria. The median age at diagnosis among MSM increased from 35.6 years (range, 20.9–70.0 years) in 2004 to 40.6 years (range, 18.6–83.6 years) in 2007 ( $P=0.001$ ), then declined to 36.0 years (range, 17.9–70.9 years) in 2008 ( $P<0.001$ ) and 37.1 years (range, 16.7–68.9 years) in 2009 (Box 1).

Gonorrhoea surveillance, 2000–2009

Between 2000 and 2009, 4744 gonorrhoea cases were diagnosed among MSM in Victoria. The median age at diagnosis among MSM increased from 32.9 years (range,

1 Median age of MSM at diagnosis of HIV, syphilis and gonorrhoea, Victoria, 2000–2009



MSM = men who have sex with men. VPCNSS = Victorian Primary Care Network for Sentinel Surveillance.

2 New HIV diagnoses among MSM, by age group, Victoria, 2000–2009\*

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Age group (years)										
15–19	3 (2.5)	3 (2.1)	0	2 (1.4)	0	1 (0.6)	2 (1.0)	1 (0.5)	4 (2.2)	4 (2.1)
20–24	9 (7.4)	4 (2.8)	11 (7.5)	14 (9.5)	14 (10.0)	11 (6.3)	11 (5.6)	10 (5.2)	20 (11.1)	17 (8.8)
25–29	31 (25.4)	23 (16.3)	22 (15.1)	18 (12.2)	14 (10.0)	25 (14.2)	28 (14.1)	26 (13.6)	29 (16.0)	42 (21.8)
30–34	20 (16.4)	34 (24.1)	33 (22.6)	35 (23.8)	24 (17.1)	33 (18.8)	31 (15.7)	30 (15.7)	36 (19.9)	31 (16.1)
35–39	21 (17.2)	32 (22.7)	32 (21.9)	26 (17.7)	35 (25.0)	34 (19.3)	42 (21.2)	41 (21.5)	28 (15.5)	35 (18.1)
40–44	13 (10.7)	21 (14.9)	23 (15.8)	19 (12.9)	23 (16.4)	31 (17.6)	28 (14.1)	39 (20.4)	31 (17.1)	25 (13.0)
45–49	10 (8.2)	10 (7.1)	5 (3.4)	11 (7.5)	17 (12.1)	15 (8.5)	22 (11.1)	22 (11.5)	10 (5.5)	15 (7.8)
$\geq 50$	15 (12.3)	14 (10.0)	20 (13.7)	22 (15.0)	13 (9.3)	26 (14.8)	34 (17.2)	22 (11.6)	23 (12.7)	24 (12.4)
Total	122 (100)	141 (100)	146 (100)	147 (100)	140 (100)	176 (100)	198 (100)	191 (100)	181 (100)	193 (100)

MSM = men who have sex with men. \* Data are number (%).

16.6–67.2 years) in 2000 to 33.9 years (range, 15.9–66.5) in 2005, then declined to 29.3 years (range, 15.9–68.6 years) in 2008 ( $P < 0.001$ ) and 29.9 years (range, 17.6–60.7 years) in 2009 (Box 1).

## DISCUSSION

In 2008, we observed a significant decline in the median age of MSM diagnosed with HIV in Victoria. This decline in age, which continued into 2009, is the first observed in Australia since the introduction of HAART. The decline in the median age of MSM recently acquiring HIV suggests recent increases in HIV transmissions (as distinct from diagnoses) and risky behaviour among younger MSM. Syphilis and gonorrhoea notification rates also increased among younger MSM. These STIs are considered markers of risky sexual behaviour,<sup>13</sup> and may provide early indicators of HIV trends

because they are more infectious<sup>14</sup> and commonly symptomatic, thus encouraging testing.<sup>15</sup>

Although the VPCNSS testing data are biased by health-seeking behaviour, the data showed no change in the median age of MSM tested between 2006 and 2009. While this finding suggests that reductions in age at HIV diagnosis may not be an artefact of younger MSM testing for HIV, it may also be the case that younger MSM were being tested at other non-VPCNSS sites. Assertions regarding overall testing trends in this group are difficult given that statewide HIV testing data lack information about the reasons for testing or the characteristics of those tested.

Examination of self-reported behavioural data from the VPCNSS showed little difference across age groups in the reported number of sexual partners. Younger gay

men were slightly more likely to engage in risky sexual behaviour and to be unaware of their partner's serostatus, and were more likely to have never previously been tested for HIV. These findings are consistent with other behavioural and epidemiological data relating to testing history and knowledge of partner serostatus.<sup>9–11</sup>

In addition, recent focus group data have shown that younger MSM are less likely to discuss HIV and other STIs with peers (Burnet Institute, unpublished data). It has also been suggested that younger gay men may be more susceptible to engaging in risky sexual behaviour because they are less aware of or less concerned about the implications of HIV since the introduction of HAART.<sup>16</sup>

As the observations reported here occurred in a limited time frame and represent a relatively small number of cases, we cannot rule out a clustering of infections within younger MSM sexual networks being responsible for the declining age at HIV diagnosis. On the other hand, if these data represent a turning point in HIV epidemiology, a number of implications emerge.

First, the potential diversification of the epidemic within the primary at-risk group highlights the importance of ongoing research and surveillance of future trends. While routine surveillance data are important to monitor changes in epidemiology, more detailed and mixed-method approaches would provide a better understanding of what is driving epidemiological changes and inform the development or refinement of public health interventions. Second, deciding when and how to respond to increasing HIV diagnoses in younger MSM is difficult. The concordance of surveillance data on age at diagnosis of HIV and other STIs suggests that a response may be needed in the short term. Such a response would need to consider more diverse health promotion strategies to ensure that prevention messages reach young MSM.

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## COMPETING INTERESTS

The Centre for Population Health at the Burnet Institute is contracted by the Victorian Department

### 3 Selected characteristics of MSM presenting for HIV testing at VPCNSS HIV clinics, by age group, April 2006 to June 2009

Characteristic	< 35 years*	≥ 35 years*	RR (95% CI)†
Total MSM tested	9379 (56.4)	7240 (43.6)	
Tested positive for HIV	142 (1.5)	157 (2.2)	
Survey data (response rate)	8786 (93.7)	6701 (92.6)	
Reason for test			
Asymptomatic screen	6746 (83.8)	5360 (85.2)	1.0
STI symptoms	1302 (16.2)	932 (14.8)	1.05 (1.01–1.09)
Time since previous negative HIV test			
< 1 year	3261 (41.1)	2449 (41.5)	1.0
≥ 1 year	3936 (49.6)	3221 (54.6)	0.97 (0.94–1.00)
Never previously tested	746 (9.4)	226 (3.8)	1.36 (1.30–1.41)
Number of anal sex partners in previous 6 months‡			
None	176 (6.1)	502 (14.0)	0.54 (0.48–0.62)
1–5	2020 (70.4)	2206 (61.6)	1.0
≥ 6	673 (23.5)	876 (24.4)	0.91 (0.85–0.97)
HIV status of regular partner			
Negative	1072 (68.9)	1296 (67.7)	1.0
Positive	165 (10.6)	303 (15.8)	0.78 (0.68–0.89)
Don't know	318 (20.5)	316 (16.5)	1.11 (1.01–1.21)
Condom use with regular partner‡			
Always	848 (44.2)	1004 (47.3)	1.0
Inconsistent	1071 (55.8)	1118 (52.7)	1.07 (1.00–1.14)
Condom use with casual partners‡			
Always	1389 (63.9)	1759 (66.8)	1.0
Inconsistent	786 (36.1)	876 (33.2)	1.07 (1.01–1.14)

MSM = men who have sex with men. RR = relative risk. STI = sexually transmitted infection. VPCNSS = Victorian Primary Care Network for Sentinel Surveillance. \* Data are number (%). Some data were missing in each category. Missing data were excluded from percentage calculations. † Univariate analysis. ‡ Represents only men tested and surveyed at the gay men's health clinics. ◆

of Health to manage HIV passive surveillance (since 1991) and HIV, other STIs and hepatitis C sentinel surveillance (since 2006) in Victoria. Data from these surveillance systems form the basis of our article.

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