National Blood-borne Viruses and Sexually Transmissible Infections

Surveillance and Monitoring Report, 2015

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in collaboration with

National BBV and STI Surveillance Subcommittee of Communicable Diseases Network Australia

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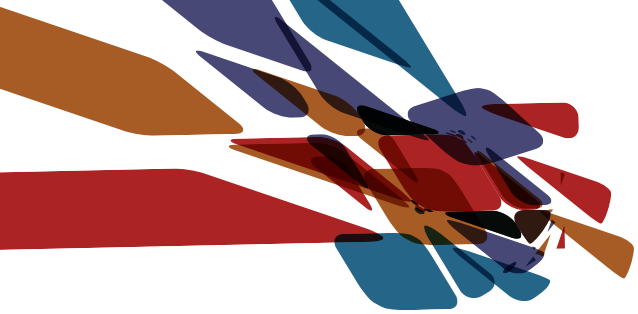

Preface

Welcome to the *National Blood-borne Viruses and Sexually Transmissible Infections Surveillance and Monitoring Report 2015.*

This report provides an annual account of progress against the objectives of Australia's National blood-borne virus (BBV) and sexually transmissible infections (STIs) Strategies.

In June 2014, Australia's federal, state and territory health ministers endorsed five new National Strategies for hepatitis B, hepatitis C, STIs, and human immunodeficiency virus (HIV) together with a National Aboriginal and Torres Strait Islander BBV and STI Strategy.

The *targets* and associated *objectives* of the National Strategies are to improve testing, treatment and uptake of preventative measures for hepatitis B, hepatitis C, STIs and HIV, and to reduce the incidence, morbidity, mortality and personal and social impacts they cause. Each objective has a series of measurable *indicators* for monitoring progress. The five National Strategies cover the period 2014 – 2017.

This report describes the *targets, objectives* and *indicators* of the National Strategies, and the level of progress being made in response. It provides measurement of the effectiveness of our national response and highlights areas requiring attention.

Acknowledgements

National Organisations

- Australasian Sexual Health Alliance, Sydney, NSW
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine, Sydney, NSW
- Australasian Society for Infectious Diseases, Melbourne, VIC
- Australian Federation of AIDS Organisations, Sydney, NSW
- Australian Government Department of Health, Canberra, ACT
- Australian Injecting and Illicit Drug Users League, Canberra, ACT
- Australian Institute of Health and Welfare, Canberra, ACT
- Australian Paediatric Surveillance Unit, Westmead, NSW
- Centre for Social Research in Health, UNSW Australia, Sydney, NSW
- Communicable Diseases Network Australia, Canberra, ACT
- Hepatitis Australia, Canberra, ACT
- National Aboriginal Community Controlled Health Organisation, Canberra, ACT
- National Association of People with HIV Australia, Sydney, NSW
- National Blood-borne Virus and Sexually Transmissible Infections Surveillance Subcommittee (NBBVSTI) of the Communicable Diseases Network of Australia (CDNA)
- National Serology Reference Laboratory, Australia, Fitzroy, VIC
- Scarlet Alliance, Australian Sex Workers Association, Sydney, NSW

State/Territory Health Departments and data providers

- Communicable Disease Control Section, Health Protection Service, ACT Government, Canberra, ACT
- Communicable Diseases Branch, Health Protection NSW, NSW Health, NSW Government, North Sydney, NSW
- Sexual Health and Blood Borne Virus Unit, Centre for Disease Control, Northern Territory Department of Health, Northern Territory Government, Darwin, NT
- Communicable Diseases Branch, Queensland Department of Health, Queensland Government, Brisbane, QLD
- Disease surveillance and investigation Unit, Communicable Disease Control Branch, SA Health, Adelaide, SA.
- Public Health Services, Department of Health and Human Services, Tasmanian Government, Hobart, TAS
- Communicable Disease Epidemiology and Surveillance, Health Protection Branch, Department of Health and Human Services Victoria, State Government of Victoria, Melbourne, VIC; Macfarlane Burnet Institute for Medical Research and Public Health Limited, Prahran, VIC; WHO Regional Reference Laboratory for Hepatitis B, Victorian Infectious Diseases Reference Laboratory, The Doherty Institute, Melbourne, VIC
- Communicable Disease Control Directorate, Department of Health, Government of Western Australia, Perth, WA

Australian HIV Observational Database

- Coffs Harbour Medical Centre, Coffs Harbour; Holdsworth House Medical Practice, Sydney; Holden Street Clinic, Gosford; Lismore Sexual Health & AIDS Services, Lismore; East Sydney Doctors, Surry Hills; RPA Sexual Health, Camperdown; Blue Mountains Sexual Health and HIV Clinic, Katoomba; Tamworth Sexual Health Service, Tamworth; St Vincent's Hospital, Darlinghurst; Taylor Square Private Clinic, Darlinghurst; Nepean Sexual Health and HIV Clinic, Penrith; Illawarra Sexual Health Service, Warrawong; Sydney Sexual Health Centre, Sydney; Western Sydney Sexual Health Centre, Parramatta; Albion Street Centre, Sydney; Clinic 16 – Royal North Shore Hospital, St Leonards; National Association of People living with HIV Australia, Sydney; Sydney School of Public Health, University of Sydney, Sydney; The Kirby Institute, UNSW Australia, Sydney; NSW
- National Aboriginal Community Controlled Health Organisation, Canberra, ACT
- Communicable Disease Centre, Royal Darwin Hospital, Darwin, NT
- Gold Coast Sexual Health Clinic, Miami; Cairns Sexual Health Service, Cairns; Clinic 87, Sunshine Coast-Wide Bay Health Service District, Nambour; Gladstone Road Medical Centre, Highgate Hill; Sexual Health and HIV Service in Metro North, Brisbane; CaraData, Parkwood; QLD
- O'Brien Street General Practice, Adelaide, SA
- Northside Clinic, North Fitzroy; Prahran Market Clinic, South Yarra; Melbourne Sexual Health Centre, Melbourne; The Alfred Hospital, Melbourne; Monash Medical Centre, Clayton; VIC
- Department of Clinical Immunology, Royal Perth Hospital, Perth, WA
- Waikato District Hospital, Hamilton; Wellington Hospital, Wellington; New Zealand

Collaboration of Australian Needle and Syringe Programs

- Directions ACT, Canberra; ACT
- ACON Hunter; Central Coast NSP Services, Gosford and Long Jetty NSP; First Step Program Port Kembla; Hunter Harm Reduction Services, Newcastle; Kirketon Road Centre and Clinic 180, Kings Cross; Mid North Coast Harm Reduction, Coffs Harbour; Murrumbidgee Harm Reduction, Albury and Wagga Wagga NSP; NSW Users and AIDS Association (NUAA), Surry Hills; Northern NSW Harm Reduction, Ballina, Byron Bay, Grafton, Lismore, Murwillumbah, Nimbin, and Tweed Heads; Harm Minimisation Redfern; Central Access Service, Kogarah and Sutherland; South Court Primary Care NSP, Nepean; Western Sydney HIV/Hepatitis C Prevention Service, Blacktown, Mt Druitt and Parramatta; NSW
- Northern Territory AIDS and Hepatitis C Council, Alice Springs, Darwin and Palmerston; NT
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- Drug and Alcohol Services South Australia, Adelaide; Mission Australia Hindmarsh Centre, Hindmarsh; Nunkuwarrin Yunti Community Health Centre, Adelaide; Street Link Youth Health Service, Adelaide; Drug Arm Warradale, Adelaide; Port Adelaide Community Health Service, Port Adelaide; Noarlunga Community Health Service, Adelaide; SA
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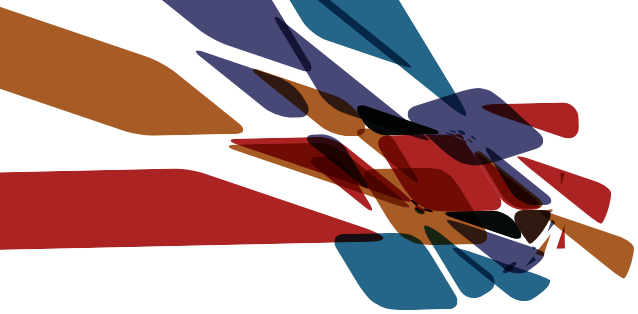
- Barwon Health Drug and Alcohol Services, Geelong; Health Information Exchange, St Kilda; Health Works, Footscray and Braybrook; Inner Space, Collingwood; North Richmond NSP, North Richmond; Southern Hepatitis/HIV/AIDS Resource and Prevention Service (SHARPS), Melbourne: VIC.
- WA AIDS Council Mobile Exchange, Perth; Western Australia Substance Users Association (WASUA), Perth and South Coast; WA.
- St Vincent's Centre for Applied Medical Research (AMR) and NSW State Reference Laboratory for HIV at St Vincent's Hospital, Sydney, NSW



Executive summary

The National Blood-borne Viruses and Sexually Transmissible Infections Surveillance and Monitoring Plan 2014 – 2017 (The Plan) outlines a series of objectives for the five new (2014 – 2017) National Strategies focused on prevention and management of hepatitis B, hepatitis C, STIs and HIV and reducing the transmission of infections and the morbidity, mortality and personal and social impacts they cause. The Plan includes targets (Table 1), with sets of measurable indicators, to monitor progress towards these objectives. This report tracks the national response to these targets during 2014 and, where feasible, makes reference to short (since 2013, the last year of the previous National Strategies) and long-term (generally since 2005) progress.

Each of the targets and indicators have a number of data considerations which are outlined in the relevant section and in further detail in the Methodological Notes of the report. Incidence is a difficult indicator to measure, and for a number of indicators notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence.

The first year of the new Strategies, 2014, provides many encouraging results, where a number of targets from the Plan are either close to or have been met but also demonstrates areas where further efforts are needed (Table 1).

Two of the four hepatitis B targets (1 and 2) have already been met: with high hepatitis B vaccination coverage rates achieved in infants, reaching the Plan's target of 95%, and documentation of immunity to hepatitis B (vaccinated or immunity from past exposure) among sexual health clinic attendees increasing from 70% in 2013 to 72% in 2014. However, while data are not yet available for 2014, of the estimated 213 300 people living in Australia with chronic hepatitis B in 2013, an estimated 56% had been diagnosed (target 3=80%), 14% were in care and 5% were on treatment (target 4=15%). In 2014, the situation was similar among the 230 470 people living with chronic hepatitis C, of whom an estimated 2790 (1%) received treatment in 2014, representing a relative 21% decline from the number on treatment the previous year (3540) (target 2=annual increase of 50%). It is likely that some patients with hepatitis C are waiting to start new treatment regimens when they become available in 2016.

Two of the five targets of the STI strategy have been met (1 and 5b); high HPV vaccination coverage has been achieved for adolescent females, reaching 73% in 2014 (target=70%) and there were low rates of congenital syphilis (1.7 per 100 000 live births), meeting the international definition for elimination. Targets 2 – 5 relating to STI incidence and testing have not yet been met. Between 2013 and 2014 there was an increase in infectious syphilis notification rates (from 7.7 to 8.7 per 100 000 population) and gonorrhoea notification rates (from 65.7 to 68.5 per 100 000 population); and the proportion of chlamydia tests yielding a positive result remained stable (12.4% in 2013 and 12.5% in 2014 among 15 – 24 year olds). STI testing in priority populations was also stable between 2013 and 2014; with 10% of 15 – 29 years old attending sentinel general practices tested for chlamydia and 66 – 67% of gay men reporting they had tested for STIs in the past 12 months.

Three of the seven HIV targets have been met (3, 4 and 5), including sustaining virtual elimination of HIV among: sex workers (HIV incidence amongst female sex workers was 0.00 per 100 person years in 2014); people who inject drugs (HIV prevalence was 1.7% in 2014 or ~0.5% if homosexual and bisexual men are excluded); and mother-to-child HIV transmission (zero HIV cases in 2014). In 2014, 75% of HIV diagnoses were attributed to male-to-male sex, and among gay and bisexual men the incidence of HIV remained stable in 2013 and 2014 (0.8 per 100 person years (target 1). Overall 73% of people with diagnosed HIV are on treatment (target 6=90%), however, among these people, 90% have achieved HIV viral suppression, reflecting an increase from 86% in 2013.

Overall, notification rates for all STIs and BBVs in Aboriginal and Torres Strait Islander people were higher than the overall Australian rates. The notification rate of congenital syphilis in Aboriginal and Torres Strait Islander people was 28.1 per 100 000 live births in 2014 (Target 1), which is 17-fold higher than the overall Australian notification rate. Target 2 (gonorrhoea) has seen progress and relates to reducing the incidence of STIs; with notification rates of gonorrhoea declining by 11% from 968.4 per 100 000 population in 2013. Other targets (2 (chlamydia, infectious syphilis), 3 and 4) have not yet been met: the proportion of chlamydia tests yielding a positive result increased (18% in 2013 and 20% in 2014); the use of sterile injecting equipment was stable at 21% in 2013 and 22% in 2014; also between 2013 and 2014 there were increases in notification rates of infectious syphilis (by 52% from 20.6 to 32.0 per 100 000 population) and newly acquired hepatitis C (by 61% from 10.2 to 16.4 per 100 000 population). While rates of HIV in the Aboriginal and Torres Strait Islander population remained low, they increased by 20% from 4.9 in 2013 to 5.9 per 100 000 population in 2014. Data on treatment uptake for HIV, hepatitis B and C among Aboriginal and Torres Strait Islander people were not available at the time of report preparation, but activities are planned to provide this information for future reports.

Detailed results of the 2014 national response against all the Indicators in each Strategy, in addition to the response against the Targets described here, are outlined in this report.

Table 1 Progress with Surveillance and Monitoring Plan targets

Strategy	Targets	2013 estimate	2014 estimate	Meets target in 2014[†]
Hepatitis B	1. Achieve 95% hepatitis B childhood vaccination	94%	95%	Yes
	2. Increase hepatitis B vaccination coverage of priority populations[i]	70%	72%	Yes
	3. Increase to 80% the proportion of all people living with chronic hepatitis B who are diagnosed	56%	*[ii]	
	4. Increase to 15% the proportion of all people living with chronic hepatitis B who are receiving antiviral treatment	5%	*[ii]	
Hepatitis C	1. Reduce the incidence of new hepatitis C infections by 50% each year	21.4 per 100 person years	*[iii]	
	2. Increase the number of people receiving antiviral treatment by 50% each year	3 540	2 790	No
STI	1. Achieve human papillomavirus (HPV) vaccination coverage of 70%			
	adolescent female	71%	73%	Yes
	adolescent male	*	60%	No
	2. Increase testing coverage in priority populations			
	Chlamydia testing in 15 – 29 year olds	10%	10%	No
	STI testing in gay men	66%	67%	No
	3. Reduce the incidence of chlamydia (positivity in 15 – 24 year olds)	12.4%	12.5%	No
	4. Reduce the incidence of gonorrhoea	Notification rate of 65.7 per 100 000 population	Notification rate of 68.5 per 100 000 population	No
	5a. Reduce the incidence of infectious syphilis	Notification rate of 7.7 per 100 000 population	Notification rate of 8.7 per 100 000 population	No
	5b. Eliminate congenital syphilis (WHO elimination target of <50 cases per 100 000 live births)	2.3 per 100 000 live births	1.7 per 100,000 live births	Yes
HIV	1. Reduce sexual transmission of HIV by 50% by 2015	0.78 per 100 person years in gay and bisexual men	0.81 per 100 person years in gay and bisexual men	No
	2. Sustain the low general population rates of HIV in Aboriginal and Torres Strait Islander people and communities	Notification rate of 4.9 per 100 000 population	Notification rate of 5.9 per 100 000 population	No
	3. Sustain the virtual elimination of HIV among sex workers	0.15 per 100 person years	0.00 per 100 person years	Yes
	4. Sustain the virtual elimination of HIV among people who inject drugs	2.1% prevalence	1.7% prevalence (~0.5% if homosexual and bisexual men are excluded)	Yes
	5. Sustain the virtual elimination of mother-to-child HIV transmission	0% transmission	0% transmission	Yes
	6. Increase treatment uptake by people with HIV to 90%	71% (among people diagnosed and living with HIV)	73% (among people diagnosed and living with HIV)	No
	7. Maintain effective prevention programs targeting sex workers and for people who inject drugs			Indicator not yet identified[iv]

Strategy	Targets	2013 estimate	2014 estimate	Meets target in 2014[†]
Aboriginal and Torres Strait Islander	1. Eliminate congenital syphilis	Notification rate of 16.3 per 100 000 population	Notification rate of 28.1 per 100 000 population	[v]
	2. Reduce the incidence of			
	chlamydia (positivity in 15 – 29 year olds)	18%	20%	No
	gonorrhoea and	Notification rate of 968.4 per 100 000 population	Notification rate of 858.5 per 100 000 population	Yes
	infectious syphilis	Notification rate of 20.6 per 100 000 population	Notification rate of 32.0 per 100 000 population	No
	3. Increase the use of sterile injecting equipment for every injecting episode[vi]	21%	22%	No
	4. Increase treatment uptake by people with HIV[vii]	*	*	*
	hepatitis C[vii] and	*	*	*
	hepatitis B[vii]	*	*	*

Incidence rates are provided per 100 person years and notification rates are provided per 100 000 population;

* Data not available;

† Decisions on whether the Target has been met are based on

a) meeting the target when the target is specific (e.g. increase to 80% the proportion with hepatitis B who are diagnosed);

b) a percentage absolute change of ≥2% for proportions when the target is not specific (e.g. increase treatment uptake or increase vaccination coverage); or

c) a relative change of ≥5% for number/notifications when the target is not specific (e.g. reduce incidence).

i Measures the proportion of patients attending sexual health clinics who are vaccinated or have past infection providing immunity against hepatitis B. Data are not available for specific priority populations which may mask differences between populations.

ii 2014 estimates are not available for the hepatitis B cascade of care, due to issues with data availability to inform the modelling

iii Hepatitis C incidence estimate among people inject drugs is not available for 2014, as insufficient time has passed to provide repeat testing information on all participants

iv HIV prevention among sex workers has been highly successful in Australia and has resulted in HIV incidence rates among the lowest in the world. There is international documentation of the best measures of effective prevention programs,[1] and discussions are ongoing as to the most relevant data to report on this target in Australia

v We have chosen not to refer to the WHO target for elimination here as the notification rate of congenital syphilis in Aboriginal and Torres Strait Islander people is 17-fold higher than the overall Australian notification rate and applicability of the WHO definition to the Australian context is questionable

vi Indicator is receptive needle/syringe sharing

vii Data on treatment uptake for HIV, hepatitis B and C among Aboriginal and Torres Strait Islander people were not available at the time of report preparation, but activities are planned to provide this information for future reports

Background

In June 2014, the Council of Australian Governments' (COAG) Health Council endorsed a set of five new National Strategies for the prevention and management of hepatitis B, hepatitis C, STIs and HIV, including in Aboriginal and Torres Strait Islander communities.

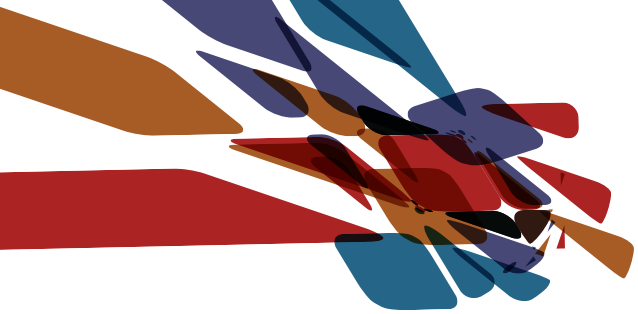
The five National Strategies are:

1. The Second National Hepatitis B Strategy 2014 – 2017
2. The Fourth National Hepatitis C Strategy 2014 – 2017
3. The Third National Sexually Transmissible Infections Strategy 2014 – 2017
4. The Seventh National HIV Strategy 2014 – 2017
5. The Fourth National Aboriginal and Torres Strait Islander Blood-Borne Viruses and Sexually Transmissible Infections Strategy 2014 – 2017

The National Strategies are endorsed by all Australian Health Ministers and set the direction for a coordinated, national response to hepatitis B, hepatitis C, STIs and HIV in the Australian population. The National Strategies provide a framework for action and accountability with objectives to scale up prevention, testing, management, care and support for people living with and at risk of BBV and STI.

The National Blood-borne Viruses and Sexually Transmissible Infections Surveillance and Monitoring Plan 2014 – 2017[2] has been developed through the Communicable Diseases Network Australia (CDNA), in consultation with the Blood-borne Viruses and Sexually Transmissible Infections Standing Committee (BBVSS) and endorsed by the Australian Health Protection Principal Committee (AHPPC). A sub-committee of the CDNA, the National BBV and STI Surveillance Sub-Committee (NBBVSTISSC) is responsible for overseeing the Plan and reporting progress to CDNA and BBVSS. The Plan includes targets that provide a specific focus for the efforts made towards achieving nationally agreed objectives. It also outlines a set of measurable indicators for monitoring progress towards reaching these targets and objectives.

The National Blood-borne Viruses and Sexually Transmissible Infections Surveillance and Monitoring Report, 2015 (this report) provides details of the indicators, and reports on how Australia is progressing in controlling BBVs and STIs in terms of risk behaviours, incidence of infection and disease morbidity as well as quality of life, including the personal and social impacts of these infections. The Kirby Institute, UNSW Australia, has responsibility for producing reports according to the National BBV and STI Surveillance and Monitoring Plan over the life of the National Strategies. This report was produced by the Surveillance, Evaluation and Research Program (SERP) of the Kirby Institute in collaboration with the NBBVSTISSC of the CDNA. This is the first report to be released during the 2014 – 2017 National Strategies for BBV and STI. The National BBV and STI Surveillance and Monitoring Plan Steering Committee also oversee this report and provide advice to CDNA on the ongoing priorities for implementation of the National Blood-borne Viruses and Sexually Transmissible Infections Surveillance and Monitoring Plan 2014 – 2017 based on indicator priorities and resource burden of data collection. Further information about national BBV and STI epidemiology can be found in the 2015 Annual Surveillance Report of HIV, viral hepatitis, STIs.[3]



Figures

Tables

1. Hepatitis B

Epidemiology overview

At the end of 2013, an estimated 213 300 (range 175 000 to 253 000) people were living with chronic hepatitis B infection in Australia. The estimated prevalence of chronic hepatitis B infection among people born in Australia is 1.0%, which by country of birth is higher than the United Kingdom (0.3%) but lower than many other countries in South East Asia and the Pacific. The primary routes of transmission in Australia are mother to child at birth (perinatal transmission) or through horizontal transmission (exposure to infected blood), especially from an infected child to an uninfected child during the first 5 years of life. Hepatitis B can also be transmitted through sexual contact or sharing needles. Australia has a concentrated hepatitis B epidemic among key populations; migrants from high prevalence countries, particularly South East Asia; Aboriginal and Torres Strait Islander peoples; men who have sex with men; and people who inject drugs. At the end of 2013, of the chronic hepatitis B cases reported in Australia, an estimated 81 267 (38%) people were born in the Asia-Pacific region, 19 837 (9.3%) were Aboriginal and Torres Strait Islander peoples, 12 158 (6%) were among people who inject drugs, 9 385 (4%) were among men who have sex with men and 9 172 (4%) people were born in Sub-Saharan Africa.[4]

Indicator status

Incidence

- The notification rate is used here as a surrogate for incidence (see Objective 1.1 on data considerations). The notification rate of newly acquired hepatitis B (defined as a new infection within the past 2 years) was 0.76 per 100 000 population, very similar to the rate of 0.80 in 2013. Over the last ten years this represents a decline of 33% from a notification rate of 1.2 per 100 000 population in 2005.

Uptake of preventative measures

- The coverage of infant hepatitis B vaccination at 24 months of age was 95% in 2014, similar to levels each year since 2010. The definition of fully vaccinated changed in late 2009, so data are only presented for 2010 onwards.
- Hepatitis B vaccination is also recommended in adult populations at higher risk of infection (priority populations). The proportion of all priority populations combined attending sexual health clinics which is vaccinated or has past infection providing immunity against hepatitis B has increased slightly from 70% in 2013 to 72% in 2014. The proportion of 15 – 19 year olds with immunity in 2014 was much higher than in those aged 55 or older (85% versus 55%). Data are not available for specific priority populations which may mask any differences between populations.

Testing and Treatment

- In 2013, an estimated 56% of people living in Australia with chronic hepatitis B infection had been diagnosed, an estimated 14% of those with chronic hepatitis B infection were in care and 5% of those with chronic hepatitis B infection had received antiviral therapy (data were not available for 2014 at the time the report was prepared).

Morbidity

- In 2013, 5% (12 of 221) of people who had a liver transplant had hepatitis B infection, increasing to 8% (18 of 224) in 2014.

Summary: In the first year of the Second National Hepatitis B Strategy, infant immunisation programs for hepatitis B meet coverage targets of 95% and the proportion of priority populations combined with immunity has increased, and evidence is emerging of benefits, with low notification rates of newly acquired hepatitis B infection in 2014 and declining notification rates compared to ten years prior. These low and declining notification rates of newly acquired hepatitis B infection need to be interpreted with caution as a number of factors may influence notifications, including changes in testing policies, screening programs, the use of new diagnostic tests, and periodic clinical and community awareness campaigns. Moreover, according to estimates from 2013, the proportion of all people estimated to be living with hepatitis B and diagnosed remains below the 80% target and the proportion of people with chronic hepatitis B infection who are in care or on recommended treatment remains low and also below the target. Overall these data suggest that an expansion of efforts to improve diagnosis and treatment of hepatitis B is required, with ongoing targeted vaccination for priority populations.

Objectives and indicators

The National Hepatitis B Strategy 2014 – 2017 identified six specific objectives, with associated indicators. Progress against these objectives and indicators is outlined in Table 2. Incidence is a difficult indicator to measure, and for a number of indicators notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence. Some *'additional information'* has been included due to data sources becoming available after the Plan was agreed and is marked accordingly.

Main Findings

Table 2 National Hepatitis B Strategy progress

Theme	Objective	Indicator		2013 estimate	2014 estimate
Incidence	1.1. Reduce hepatitis B infections >	1.1	Annual rate of notifications of newly acquired hepatitis B (per 100 000 population)[i] >	0.80	0.76
Uptake of preventative measures	1.2. Achieve and maintain high levels of hepatitis B vaccination >	1.2a	Coverage of hepatitis B vaccination at 12 months of age 24 months of age >	 91% 94%	 92% 95%
		1.2b	*Additional information:* Proportion of population attending STI clinics vaccinated or with past infection for hepatitis B >	70%	72%
Testing	1.3. Increase the proportion of people with chronic hepatitis B who have been diagnosed >	1.3a	Estimated proportion of people with chronic hepatitis B who have been diagnosed >	56%	*[ii]
		1.3b	Annual rate of notifications of unspecified hepatitis B (per 100 000 population) >	28.3	27.7
		1.3c	Prevalence of hepatitis B in pregnant women by country of birth and Aboriginal and Torres Strait Islander status >	*	*[iii]
Treatment	1.4. Increase access to appropriate management and care for people with chronic hepatitis >	1.4a	Proportion of people with chronic hepatitis B dispensed drugs for hepatitis B infection >	5%	*[ii]
		1.4b	*Additional information:* Proportion of people with chronic hepatitis B who received monitoring for chronic hepatitis B >	14%	*[ii]
Personal and social Impact	1.5. Reduce burden of disease attributed to chronic hepatitis B >	*1.5*	*Additional information:* Proportion of liver transplant recipients with hepatitis B >	5%	8%
	1.6. Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health >	Stigma indicator being developed[iv]			

Notification rates are given out of 100 000 population and to 1 decimal place;
Percentages (%) are rounded to the nearest whole number

* Denotes data not available

i In the absence of appropriate data for incidence, notifications data have been used to provide an indication of changes in infection levels, but should be interpreted with caution

ii 2014 estimates are not available for the hepatitis B cascade of care, due to issues with data availability to inform the modelling;

iii Data unavailable for 2014 reporting but will be included in future reports

iv Among people who inject drugs and men who have sex with men and people living with HIV and hepatitis C (which may include people living with hepatitis B infection)

1.1 Reduce new hepatitis B infections

1.1 Annual rate of notifications of newly acquired hepatitis B

Indicator definition

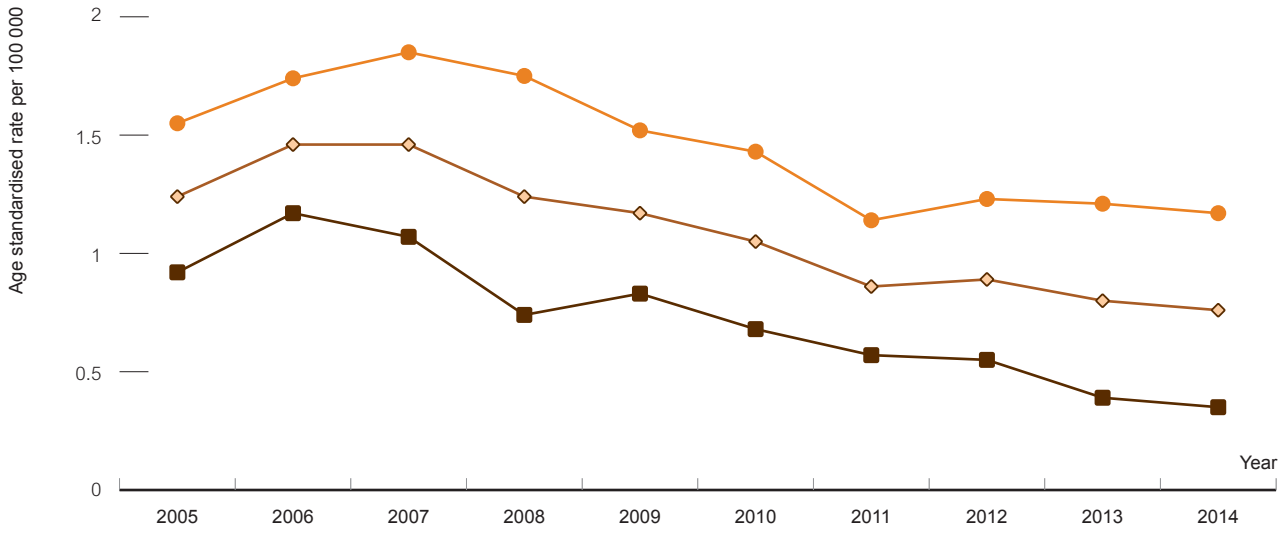
Numerator	Number of newly acquired hepatitis B notifications reported to NNDSS
Denominator	Australian population reported by the ABS

Background: Monitoring the rate of newly acquired (within the last 2 years) hepatitis B infection and understanding who is being infected is important to inform prevention responses, the most effective of which is vaccination (see indicator 1.2). When interpreting information about newly acquired hepatitis B infection it is important to understand the clinical course of hepatitis B infection and how it differs between hepatitis B infection acquired in early childhood and that in adulthood. Infection acquired in childhood usually leads to chronic life-long infection, and rarely acute disease. Infection acquired in adulthood, in contrast, frequently results in symptomatic acute hepatitis followed by clearance of hepatitis B surface antigen (hBsAg) in the majority of patients.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. Australia's estimate of incident hepatitis B infections is based on notifications of newly acquired hepatitis B infection made to the National Notifiable Diseases Surveillance System (NNDSS). Newly acquired hepatitis B infection is defined as newly diagnosed hepatitis B infection in a person previously known not to have the infection within the last two years. For some newly diagnosed cases, it is possible to determine that they were acquired in the 2 years prior to diagnosis, on the basis of a prior negative test. Determination of a case as 'newly acquired' is heavily reliant on public health follow-up, with the method and intensity of follow-up varying by jurisdiction and over time. See Methodological Notes for further details of data considerations.

Results: Between 2013 and 2014, the age-standardised notification rate of newly acquired hepatitis B remained stable at 0.80 and 0.76 per 100 000 population respectively (Figure 1). In the past ten years, there has been a decline in the notification rate of newly acquired hepatitis B cases by 39% from 1.24 per 100 000 population in 2005 to 0.76 per 100 000 population in 2014, with declines in both sexes in the past ten years; however the notification rate of newly acquired hepatitis B in 2014 was over three times greater in males than females (1.17 vs 0.35 per 100,000 population). There has also been a decline in all 5-year age groups from15 – 39 years, and consistently low notification rates in those aged <15 years (Figure 2). Understanding changes in newly acquired hepatitis B should be interpreted alongside indicator 1.2, which relates to hepatitis B vaccination coverage.

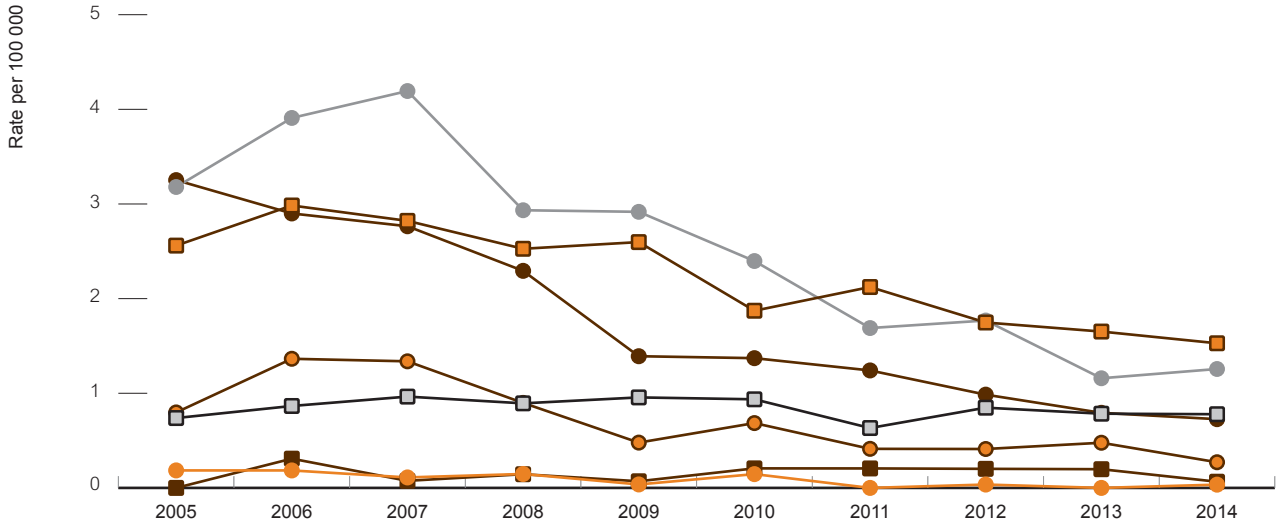
Figure 1 Newly acquired hepatitis B notification rate per 100 000 population, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	1.24	1.46	1.46	1.24	1.17	1.05	0.86	0.89	0.80	0.76
Males	1.55	1.74	1.85	1.75	1.52	1.43	1.14	1.23	1.21	1.17
Females	0.92	1.17	1.07	0.74	0.83	0.68	0.57	0.55	0.39	0.35

Source: NNDSS

Figure 2 Newly acquired hepatitis B notification rate per 100 000 population, 2005 – 2014, by age group



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
0-4	0.00	0.31	0.07	0.14	0.07	0.21	0.21	0.20	0.20	0.07
5-14	0.18	0.18	0.11	0.15	0.04	0.15	0.00	0.04	0.00	0.03
15-19	0.80	1.36	1.34	0.90	0.48	0.69	0.41	0.41	0.48	0.27
20-24	3.25	2.90	2.76	2.29	1.39	1.37	1.24	0.99	0.79	0.73
25-29	3.18	3.91	4.19	2.93	2.92	2.40	1.69	1.77	1.16	1.26
30-39	2.56	2.98	2.82	2.53	2.60	1.87	2.12	1.75	1.65	1.53
40+	0.74	0.87	0.96	0.89	0.96	0.94	0.63	0.85	0.78	0.78

Source: NNDSS

1.2 Achieve and maintain high levels of hepatitis B vaccination

1.2a Coverage of hepatitis B vaccination at 12 and 24 months

Indicator definition

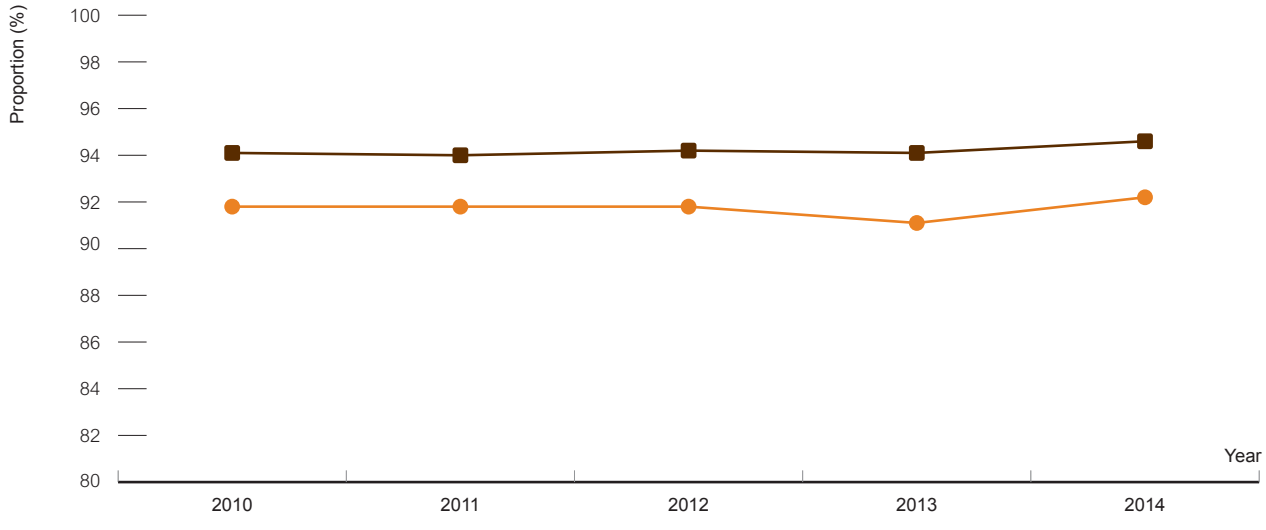
Numerator	Number of children in the relevant cohort who have dose 3 by 12 (and 24) months of age recorded on the Australian Childhood Immunisation Register (ACIR)
Denominator	Number of children turning 12 (and 24) months of age in the measurement year on the ACIR

Background: Primary prevention strategies to protect people from acquiring hepatitis B infection include vaccination, use of new needles and condom use, reflecting the different modes of transmission. Vaccination is the most effective means of preventing the transmission of hepatitis B. Effective implementation of the vaccination program will provide the most substantial long term health impacts, due to the inverse relationship between age at initial infection and risk of progression to chronic infection. In 1985, the Northern Territory (NT) introduced hepatitis B screening to all pregnant women and vaccination to infants born to mothers living with chronic infection. In 1990, universal infant vaccination was implemented in the NT and in 1998 a catch-up program targeting 6 – 16 year olds was introduced. In 2000, hepatitis B vaccination of all infants commenced in other states and territories of Australia and the introduction of a universal adolescent (teenagers aged 12 – 15 years) school based hepatitis B vaccination catch-up program commenced in 1998.[5]

Data source and considerations: Hepatitis B vaccine coverage was estimated using data from the National Centre for Immunisation Research of Vaccine Preventable Diseases (NCIRS) surveillance of immunisation coverage and the Australian Childhood Immunisation Register (ACIR). Data are only included from 2010 onwards, as the definition of 'fully vaccinated' changed in late 2009.[6]

Results: Hepatitis B coverage at 24 months has remained reasonably stable since 2010, increasing very slightly between 2013 and 2014 at 94% and 95% respectively (Figure 3). Over the period 2010 – 14, hepatitis B vaccination coverage at 12 months of age was close to 92%.

Figure 3 Hepatitis B vaccination coverage estimates at 12 and 24 months, 2010 – 2014



	2010	2011	2012	2013	2014
12 months	91.8%	91.8%	91.8%	91.1%	92.2%
24 months	94.1%	94.0%	94.2%	94.1%	94.6%

Source: NCIRS

1.2b *Hepatitis B vaccination coverage of priority populations (additional information)*

Indicator definition

Numerator	Number of sexual health clinic attendees with documentation of immunity to hepatitis B (vaccinated or immunity from past exposure)
Denominator	Number of sexual health clinic attendees in a year

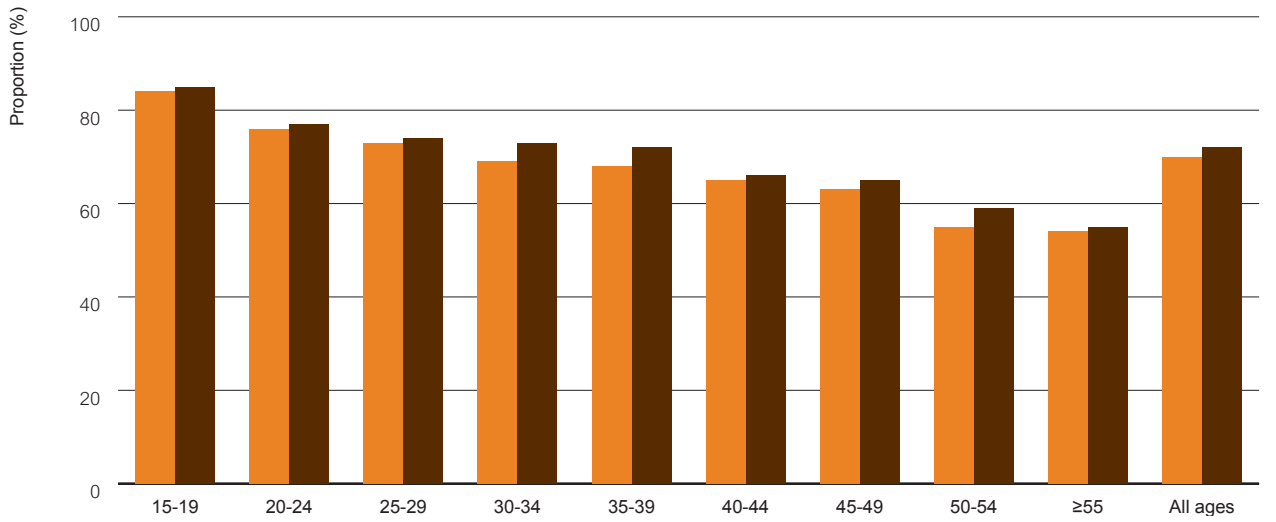
Background: Hepatitis B vaccination is not recommended in all adults, but rather priority populations at higher risk of infection, including men who have sex with men, people who inject drugs, Aboriginal and Torres Strait Islander people, household and sexual contacts of people with hepatitis B, sex workers, persons at occupational risk, HIV positive people and migrants from hepatitis B endemic countries. At sexual health clinics in Australia, all patients are asked about past hepatitis B vaccination on their first visit. If no prior vaccination is reported or the patient's vaccination status is uncertain, the clinic policy is to screen high risk patients for hepatitis B infection, and if susceptible, offer vaccination.

Data source and considerations: Data from 44 sexual health clinics participating in the ACCESS sentinel surveillance project were used for this indicator. Classification of hepatitis B vaccination and immunity among sexual health service attendees was based on pathology results for tests of hepatitis B surface antigens (hBsAg), core antibodies (hBcAb), and surface antibodies (hBsAb); clinical diagnoses of acute or chronic hepatitis B; and vaccination status as recorded in a patient's file. Patients were only included in this analysis if one or more of these data were available. See Methodological Notes for further detail of the ACCESS sentinel surveillance project. The levels of vaccination coverage in each priority population may vary, and further work is being done to present these data by priority sub-population in future reports. This will provide valuable information to inform targeted vaccination programs for priority populations.

Results: In 2014, there were 19 964 people attending the clinics for whom vaccination documentation or pathology details were available (median age=30): 64% identified themselves as men who have sex with men, 2% as people who inject drugs, 31% as heterosexuals aged 15 – 29 years, 8% as sex workers (1% male and 7% female), and 3% as Aboriginal and Torres Strait Islander peoples.

In 2014, 72% had documentation of immunity to hepatitis B. The proportion immune to hepatitis B in 2014 was >70% in those aged between 15 and 39, decreasing to 55% among those aged 55 years and above (Figure 4). This compares to 2013 when 70% of people had documentation of immunity to hepatitis B (vaccinated or immunity from past exposure) (Figure 4).

Figure 4 Proportion of people attending sexual health clinics with immunity to hepatitis B[1], based on vaccination documentation and serology, 2013 – 2014, by age group



	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	≥55	All ages
2013	84%	76%	73%	69%	68%	65%	63%	55%	54%	70%
2014	85%	77%	74%	73%	72%	66%	65%	59%	55%	72%

[1] Vaccinated or immunity from past exposure

Source: ACCESS

1.3 Increase the proportion of people with chronic hepatitis B who have been diagnosed

1.3a Estimated proportion of people with chronic hepatitis B who have been diagnosed

Indicator definition

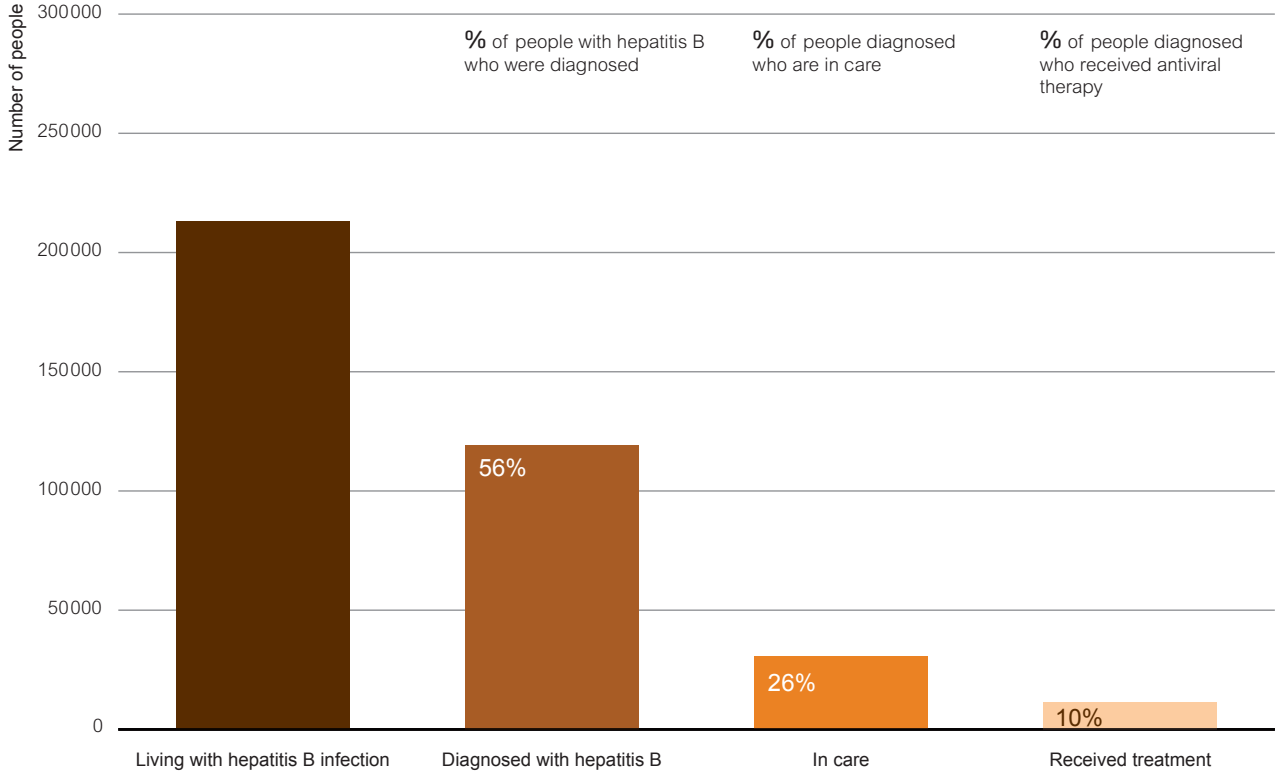
Numerator	Cumulative number of hepatitis B notifications reported to NNDSS from 1971 – 2013
Denominator	Modelled total number of people who have ever had chronic hepatitis B in Australia

Background: Of the estimated 213 300 people with chronic hepatitis B in Australia, many people remain unaware of their infection status. Late diagnosis of hepatitis B infection has a significant impact on mortality and morbidity. Therefore, it is important to increase the proportion of people with chronic hepatitis B who have been diagnosed.

Data source and considerations: The proportion of people living with chronic hepatitis B who have been diagnosed was estimated using model-derived estimates of the total number of people who have ever had chronic hepatitis B in Australia as the denominator, and the cumulative number of notifications of hepatitis B from 1971 – 2013 as the numerator. Mortality is not included in this aspect of the analysis, and therefore the proportion derived represents those ever having lived with chronic hepatitis B who have ever been diagnosed. See Methodological Notes for further detail. Data were not available for 2014 at the time of report writing, but 2014 and 2015 data will be included in next year's report.

Results: During 2013, an estimated 213 300 (175000 – 253000) people were living with chronic hepatitis B and an estimated 119 448 (56%) were diagnosed with hepatitis B (Figure 5).

Figure 5 The 2013 hepatitis B diagnosis and care cascade



	Living with hepatitis B infection	Diagnosed with hepatitis B	In care	Received treatment
Estimate	213 330	119 448	30 614	11 527

Source: See Methodological Notes for detail

1.3b *Annual rate of notifications of unspecified hepatitis B*

Indicator definition

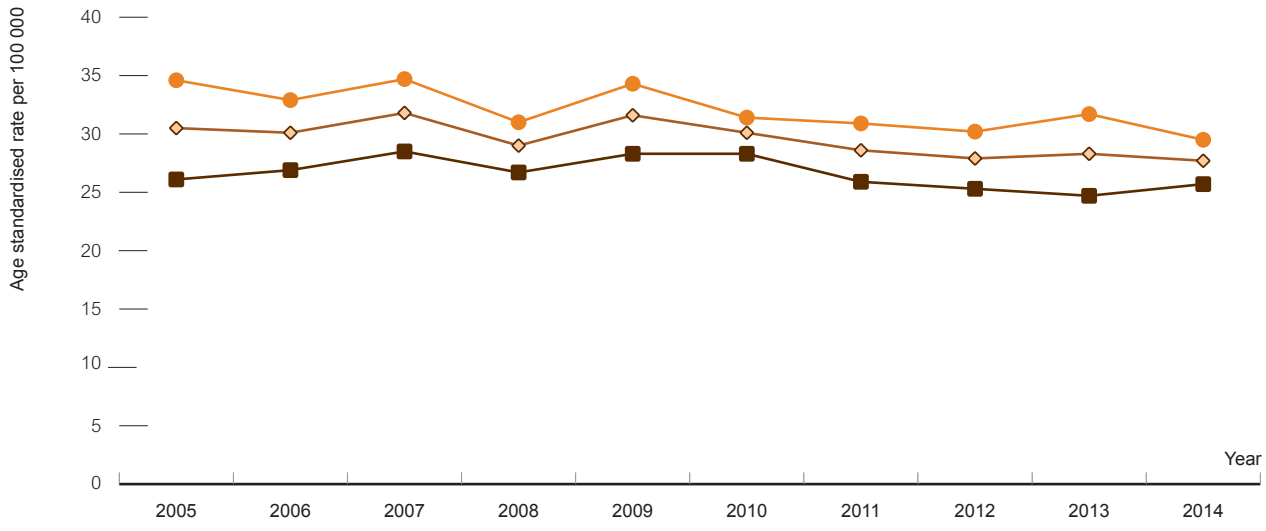
Numerator	Number of notifications of unspecified hepatitis B reported to NNDSS
Denominator	Australian population reported by the ABS

Background: In Australia, hepatitis B infections are reported as newly acquired or unspecified. Unspecified hepatitis B requires detection of hBsAg in a patient with no prior evidence of HBV who does not meet criteria for newly acquired infection. Unspecified infection can provide an indication of the burden of diagnosed chronic hepatitis B in a population, and can be used to complement serosurveys.

Data source and considerations: Hepatitis B is notified as 'unspecified', where the infection was acquired more than 24 months prior to diagnosis or the period of infection is unspecified. The annual rate of notifications of unspecified hepatitis B was calculated using data from the National Notifiable Diseases Surveillance System (NNDSS). See Methodological Notes for further details of data considerations.

Results: The notification rate of unspecified hepatitis B in Australia was stable between 2013 and 2014, at 28.3 per 100 000 population and 27.7 respectively (Figure 6). Long-term the notification rate has decreased by 9% from 30.5 in 2005. Notification rates among males remained slightly higher than among females in 2014, at 29.5 per 100 000 population for males and 25.7 per 100 000 population for females.

Figure 6 Unspecified hepatitis B rate of notification per 100 000 population, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	30.5	30.1	31.8	29.0	31.6	30.1	28.6	27.9	28.3	27.7
Males	34.6	32.9	34.7	31.0	34.3	31.4	30.9	30.2	31.7	29.5
Females	26.1	26.9	28.5	26.7	28.3	28.3	25.9	25.3	24.7	25.7

Source: NNDSS

1.3c Prevalence of hepatitis B in pregnant women by country of birth and Aboriginal and Torres Strait Islander status

Indicator definition

Numerator	Number of hepatitis B notifications in women recorded as giving birth during the specified time period
Denominator	Number of women recorded as giving birth during the specified time period

Background: Transmission of hepatitis B virus from mother to infant during the perinatal period represents one of the most efficient modes of hepatitis B infection and often leads to severe long-term sequelae.[7] Infants born to mothers positive for hepatitis B surface antigen (hBsAg) and hepatitis B envelope antigen (hBeAg) have a 70%-90% chance of acquiring perinatal HBV infection, and 85%-90% of infected infants will become chronic hepatitis B carriers.[8, 9] Prenatal screening of all pregnant women identifies women who are hBsAg-positive, resulting in treatment of their newborns with hepatitis B immune globulin (HBIG) and hepatitis B vaccine, which is 85%-95% effective in preventing the progression to chronic carriers.[10] Routine antenatal screening of pregnant women for hepatitis B surface antigen (hBsAg) is recommended in Australia to enable appropriate management to prevent newborn infants developing hepatitis B infection. It also enables appropriate follow-up and management of mothers who have chronic hepatitis B infection, identification of the hepatitis B immune status of other household members, and protection of those who are susceptible to hepatitis B infection.[11] Finally, as there is a very high coverage of hepatitis B antenatal screening, the findings can provide a measure of prevalence, and indicate the long-term effectiveness of infant vaccination programs in cohorts of women who would have been eligible for the infant vaccine.

Data source and considerations: To determine the long-term effectiveness of the infant hepatitis B vaccination programs, a number of datasets will be linked including perinatal, national notifiable diseases surveillance system data, and the immunisation register. Linkages will be conducted separately in each state and territory. Data will then be used to determine the antenatal prevalence of chronic hepatitis B infection by year of birth, region, Aboriginal and Torres Strait Islander status, hepatitis B immunization status, and where possible, country of birth. Data are unavailable this year, but will be included in 2016 reporting.

1.4 Increase access to appropriate management and care for people with chronic hepatitis B

1.4a Proportion of people with chronic hepatitis B dispensed drugs for hepatitis B infection

Indicator definition

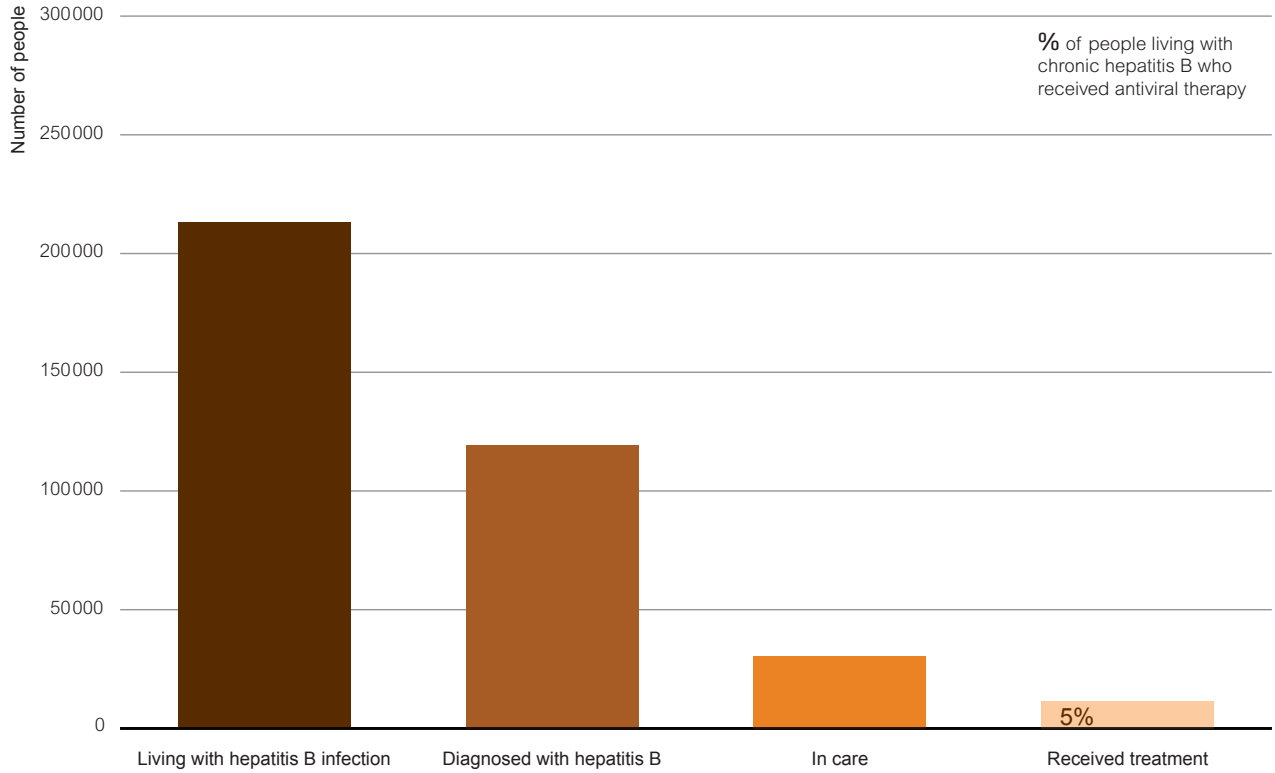
Numerator	Number of people dispensed drugs for chronic hepatitis B infection
Denominator	Modelled estimate of the number of people estimated to be living with chronic hepatitis B

Background: Increasing access to antiviral treatment will prevent deaths due to advanced liver disease, and help address the rising burden of hepatitis B related liver cancer. It is important to note that not all people with hepatitis B will benefit from treatment. Treatment initiation depends on disease stage, with chronic infection and liver damage indicating treatment should be considered. The current national target for chronic hepatitis B treatment is 15% by 2018, as treatment is only beneficial in some stages of infection.[12, 13]

Data source and considerations: The number of people receiving treatment for chronic hepatitis B in 2013 was derived using pharmaceutical dispensing data from the Department of Human Services Australia regarding the number of individuals receiving a treatment indicated for hepatitis B virus infection (adefovir, entecavir, lamivudine, telbivudine, tenofovir, and pegylated interferon). See Methodological Notes for further detail.

Results: In 2013, nationally, 5% of people living with hepatitis B had received antiviral treatment (Figure 7). Estimates for 2014 were unavailable at the time of preparation of this report.

Figure 7 The 2013 hepatitis B diagnosis and care cascade, highlighting the proportion of people with hepatitis B on treatment



	Living with hepatitis B infection	Diagnosed with hepatitis B	In care	Received treatment
Estimate	213 330	119 448	30 614	11 527

Source: See Methodological Notes for detail

1.4b *Proportion of people with chronic hepatitis B who received monitoring for chronic hepatitis B (additional information)*

Indicator definition

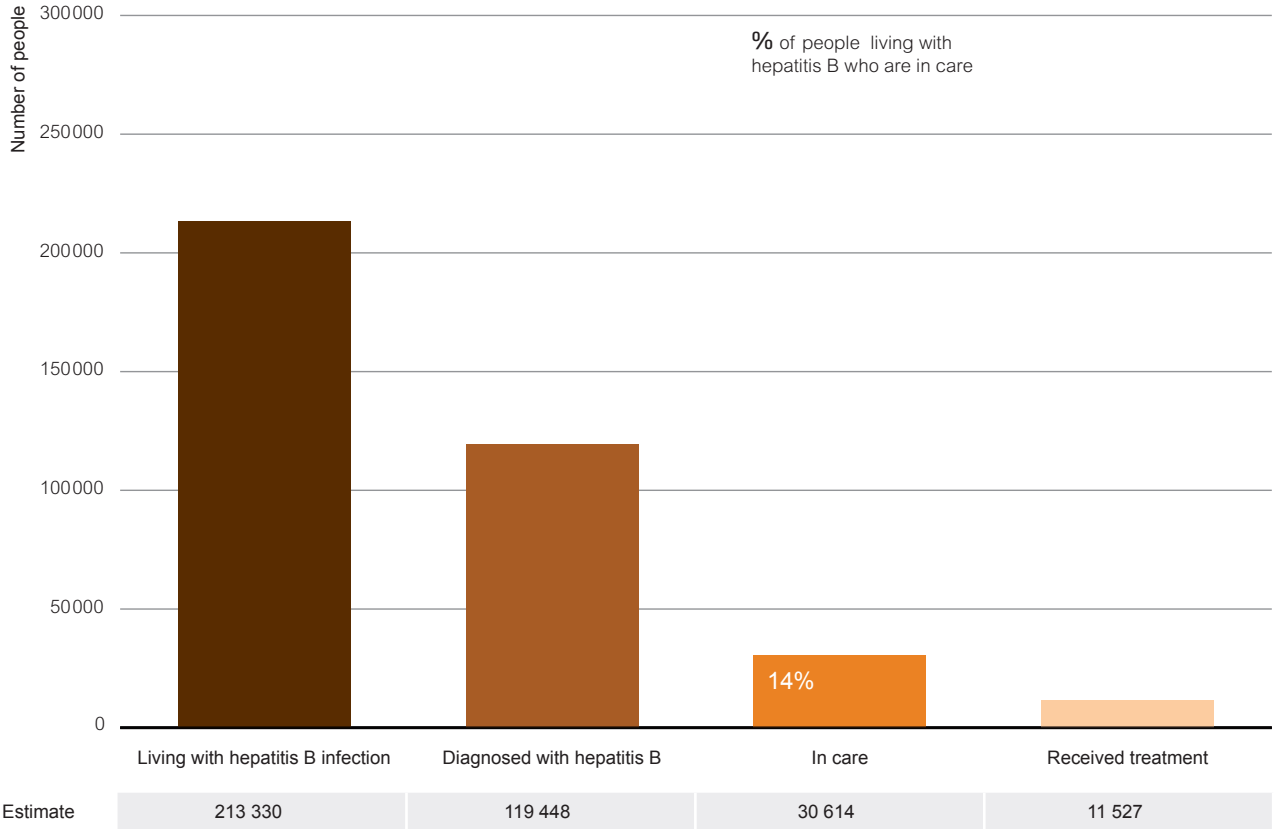
Numerator	Number of people with chronic hepatitis B infection in care
Denominator	Modelled estimate of the number of people estimated to be living with chronic hepatitis B

Background: People living with chronic hepatitis B require regular monitoring to determine their clinical status which informs treatment recommendations.[12] In people not on treatment, hepatitis B DNA viral load testing is an important component of monitoring disease progression.[14] Monitoring of viral load in people on treatment is important to provide information on success and required duration of antiviral therapy.[15]

Data source and considerations: The number of people who received monitoring for chronic hepatitis B in 2013 was determined using Department of Human Services data regarding rebate for an annual hepatitis B viral load test. See Methodological Notes for further detail.

Results: In 2013, nationally 30 614 people received either antiviral therapy (11 527), or a yearly viral load test (19 087), representing an estimated 14% of people living with chronic hepatitis B in care or on treatment (Figure 8). 2014 estimates were unavailable at the time of preparation of this report.

Figure 8 The 2013 hepatitis B diagnosis and care cascade, highlighting the proportion of people living with hepatitis B receiving monitoring



	Living with hepatitis B infection	Diagnosed with hepatitis B	In care	Received treatment
Estimate	213 330	119 448	30 614	11 527

Source: See Methodological Notes for detail

1.5 Reduce the burden of disease attributed to chronic hepatitis B

Indicator being developed

The burden of disease caused by the hepatitis B virus includes liver cirrhosis, cancer and liver transplants. Mathematical modelling will be conducted in 2016 to provide an indicator on disease progression and deaths. One currently available measure of the extent of illness caused by hepatitis B is the number of liver transplants due to chronic infection. In 2014, 18 of 224 (8%) people who had a liver transplant in 2014 had hepatitis B infection, this compares to 12 of 221 (5%) in 2013.[3] Caution should be taken in interpreting these data, as the numbers are small and moreover, changes will be influenced by transplant rates.

1.6 Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health

Indicator being developed

Stigma is recognised as being a critical barrier to effective responses to blood borne viruses and sexually transmitted infections. Among affected communities, stigma is associated with mental health issues, social isolation, and can discourage people from accessing essential health care and medical treatment, including uptake and adherence to medications. This can have adverse implications for public health initiatives that target prevention and management of infection. Achieving 'zero stigma and discrimination' is a main goal of the 2011 – 2015 strategy of the Joint United Nations Programme on HIV/AIDS. Therefore, monitoring of the experiences of stigma and discrimination by affected communities is essential to assess the achievement of this goal.

The Centre for Social Research in Health, UNSW has received funding from the Australian Government Department of Health to develop an indicator of stigma among priority groups identified by the five national strategies addressing blood borne viruses (BBVs) and sexually transmissible infections. However, at this stage, the project has been resourced for the indicator to be implemented with some priority groups including in existing routine surveys of people who inject drugs and men who have sex with men and in new surveys of people living with HIV and hepatitis C. The indicator will monitor experiences of stigma within these samples in relation to BBV status, injection drug use, sexual orientation and sex work. A mirrored indicator will also be included in a new survey of health care providers to monitor the expression of stigma. Data will be collected between April and October 2016, and a final report produced by December 2016.

Equally, enabling social and legal environments are essential to evidence-based prevention, treatment, care and support. At this stage there has been no work on an indicator for legal or human rights issues.

2. Hepatitis C

Epidemiology overview

During 2014, an estimated 230 470 (180 490 – 243 990) people were living with chronic hepatitis C. Australia has a concentrated chronic hepatitis C epidemic primarily among people who inject drugs, with hepatitis C prevalence of 54% among people who inject drugs attending needle and syringe programs in Australia. Other priority populations for hepatitis C include people who have injected drugs in the past particularly people from Aboriginal and Torres Strait Islander and culturally and linguistically diverse backgrounds, older people, and sex workers, and people in custodial settings.

Indicator status

Incidence

- The incidence rate of hepatitis C, based on repeat testing from participants in the Australian Needle and Syringe Program Survey, declined annually between 2005 and 2009 from 14.3 (95%CI: 7.4 – 27.5) to 4.0 (95%CI: 1.3 – 12.3) per 100 person years, but has been increasing since 2011, to 21.4 per 100 person years (95%CI: 12.9 – 35.6) in 2013. Data for 2014 are not available due to the method used to calculate incidence.

Uptake of preventative measures

- The per capita number of needles and syringes distributed annually remained steady between 2013 and 2014 at 2.8 per capita among those aged 15 – 64 years. This equates to ~44 million needles and syringes distributed, an increase of 12% from 2.5 per capita in 2005 when ~34 million needles and syringes were distributed.
- Individual-level syringe coverage is often measured as the proportion of injections per month performed using a sterile syringe per injector. A similar proportion of people who inject drugs attending needle and syringe programs reported using a new needle or syringe for every injection in the past month in 2013 (75%) and 2014 (77%), an increase from 73% in 2005.
- In 2014, the proportion of people who inject drugs attending needle and syringe programs who reported re-using another person's used needle and syringe (receptive syringe sharing) in the previous month was 16%, similar to the 15% proportion reported in 2013, and the past ten years.

Treatment

- During 2014, an estimated 230 470 people were living with chronic hepatitis C, of whom an estimated 44 405 (19%) had ever been on antiviral therapy and 2 790 (1%) of people with chronic hepatitis C received treatment in 2014, compared to 3 540 (2%) in 2013.

Morbidity

- At the end of 2014, the estimated number of people with severe fibrosis/hepatitis C related cirrhosis was 44 730, a 14% increase from the 39 120 cases in 2013, and more than double that observed in 2004 (18 580 cases).
- There were an estimated 690 deaths (range 440 – 970) attributable to chronic hepatitis C infection in 2014, an increase of nearly 10% since 2013 when there were 630 deaths (range 400 – 880), and an increase of 146% since 2004 when there were an estimated 280 deaths (range 180 – 370).
- Over a third (36%) of people who had a liver transplant in 2014 (81 of 224) had hepatitis C infection, compared to 38% (85 of 221) in 2013.

Summary: In the first year of reporting against the 4th National hepatitis C Strategy, the 2013 hepatitis C incidence rate was 21.4 (95%CI: 12.9 – 35.6) per 100 person years, based on repeat testing of people who inject drugs attending needle and syringe programs. In 2014, a greater number of needles and syringes were distributed annually, the individual-level syringe coverage was high at 75% and injecting risk behaviours remained stable and low. However, in 2014, only 1% of people with chronic hepatitis C infection were estimated to have received curative therapy in that year, despite nearly 45 000 people having severe fibrosis/hepatitis C related cirrhosis. Overall these data emphasise the continued need to prioritise prevention programs such as needle and syringe programs, and opioid substitution treatment, as well as the need to increase the proportion of people accessing treatment, in order to reduce HCV-related burden of disease and deaths. Treatment of hepatitis C is rapidly changing and the low proportion on treatment is reflective of the currently available interferon based therapies. It is anticipated that the proportion on treatment will improve once the new direct acting antivirals (DAAs) are made available through the Australian Pharmaceutical Benefits Scheme (PBS) in March 2016.

Objectives and indicators

The National Hepatitis C Strategy 2014 – 2017 identified five specific objectives, with associated indicators (Table 3). Progress against these objectives and indicators is outlined in Table 3. Some *'additional information'* has been included due to data sources becoming available after the Plan was agreed and is marked accordingly.

Main Findings

Table 3 National Hepatitis C Strategy progress

Theme	Objective	Indicator		2013	2014
Incidence	2.1 Reduce the incidence of hepatitis C infections >	2.1	Annual incidence rate of hepatitis C in people who inject drugs (per 100 person years) >	21.4	*[i]
Uptake of preventative measures	2.2 Reduce the risk behaviours associated with the transmission of hepatitis C >	2.2a	Per capita number of needles and syringes distributed in the previous calendar year >	2.8	2.8
		2.2b	Proportion of all injections by people who inject drugs in which a new needle and syringe was used in the previous calendar month >	75%	77%
		2.2c	Proportion of people who inject drugs reporting re-using another person's used needle and syringe in the previous month >	15%	16%
Treatment	2.3 Increase access to appropriate management and care for people with chronic hepatitis >	2.3a	Proportion of people with chronic hepatitis C dispensed drugs for their infection in the previous calendar year >	3%	1%
		2.3b	Treatment for hepatitis C over lifetime in people who inject drugs >	11%	13%
		2.3c	*Additional information:* Recent treatment uptake for hepatitis C in people who inject drugs >	2%	1%
Personal and social impacts	2.4 Reduce the burden of disease attributed to chronic hepatitis C >	*2.4a*	*Additional information:* The number of people with severe fibrosis/hepatitis C related cirrhosis >	39 120	44 730
		2.4b	*Additional information:* Estimated number of deaths	630	690
	2.5 Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health >	Stigma indicator being developed[ii]		*	*

Incidence rates are per 100 person years, and to 1 decimal place

Percentages (%) are rounded to the nearest whole number

* Denotes data not available;

i Hepatitis C incidence estimate among people inject drugs is not available for 2014, as insufficient time has passed to provide repeat testing information on all participants;

ii Among people who inject drugs and men who have sex with men and people living with HIV and hepatitis C

2.1 Reduce the incidence of hepatitis C

2.1 Annual incidence of hepatitis C in people who inject drugs

Indicator definition

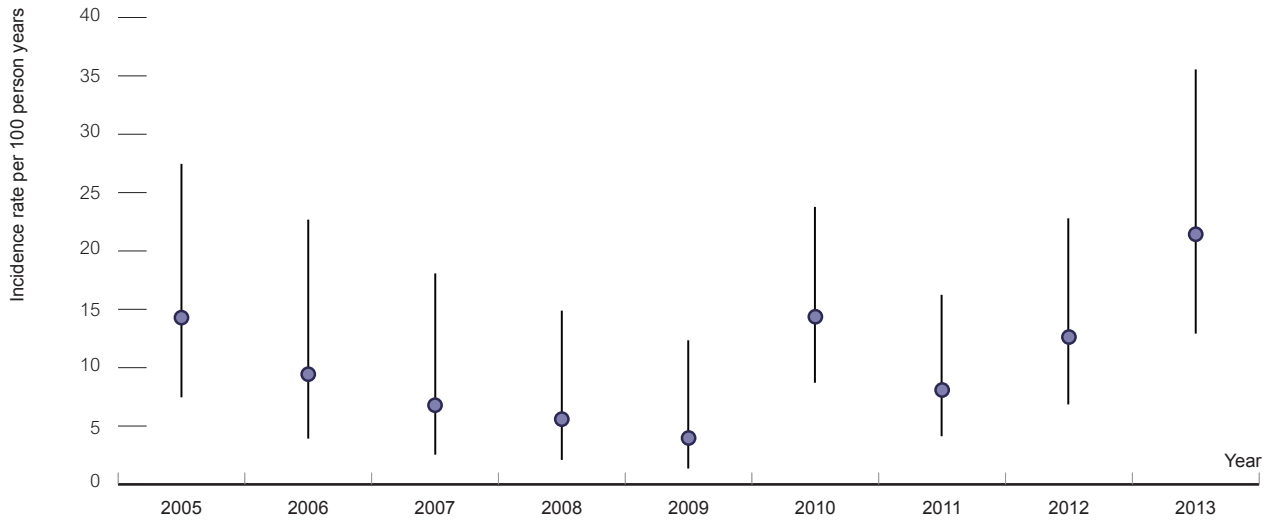
Numerator	Number of HCV seroconversions, defined as the midpoint between the last negative and first positive test for HCV antibodies
Denominator	Person years at risk, defined as the time between the first and last test in the cohort time period

Background: Hepatitis C incidence represents new infections (generally acquired in the past two years) and is the best indicator of changes in transmission in a population.

Data source and considerations: Hepatitis C incidence can be calculated from repeat participants in the Australian Needle and Syringe Program Survey (ANSPS). Among those without prior exposure to hepatitis C, the number of seroconversions (HCV antibody negative to HCV antibody positive over a two year period) is divided by the person time at risk. See Methodological Notes for further details and limitations.

Results: Among repeat participants in the ANSPS between 2005 and 2013, there were 74 seroconversions, yielding a pooled hepatitis C incidence rate of 10.8 per 100 person years (95%CI: 8.6-13.6). The incidence rate of hepatitis C, was 21.4 (95%CI: 12.9 – 35.6) per 100 person years in 2013, the highest in 10 years. The incidence rate appeared to decline annually between 2005 and 2009 from 14.36(95%CI: 7.4 – 27.5) to 3.97 (95%CI: 1.3 – 12.3) per 100 person-years in 2009, but has been increasing since 2011 (Figure 9). The incidence rate for 2014 is not available due to the method used to calculate incidence.

Figure 9 Estimated annual incidence rate of hepatitis C virus infection among people who inject drugs seen at needle and syringe programs, per 100 person-years, 2005 – 2013[1]



	2005	2006	2007	2008	2009	2010	2011	2012	2013
Incidence	14.29	9.44	6.78	5.59	3.97	14.36	8.09	12.62	21.43

[1] The confidence intervals between these estimates overlap meaning the differences observed are not statistically significant. An estimate is not available for 2014, as insufficient time has passed to provide repeat testing information for all participants.

Source: ANSPS

2.2 Reduce the risk behaviours associated with the transmission of hepatitis C

2.2a Per capita number of needles and syringes distributed in the previous calendar year

Indicator definition

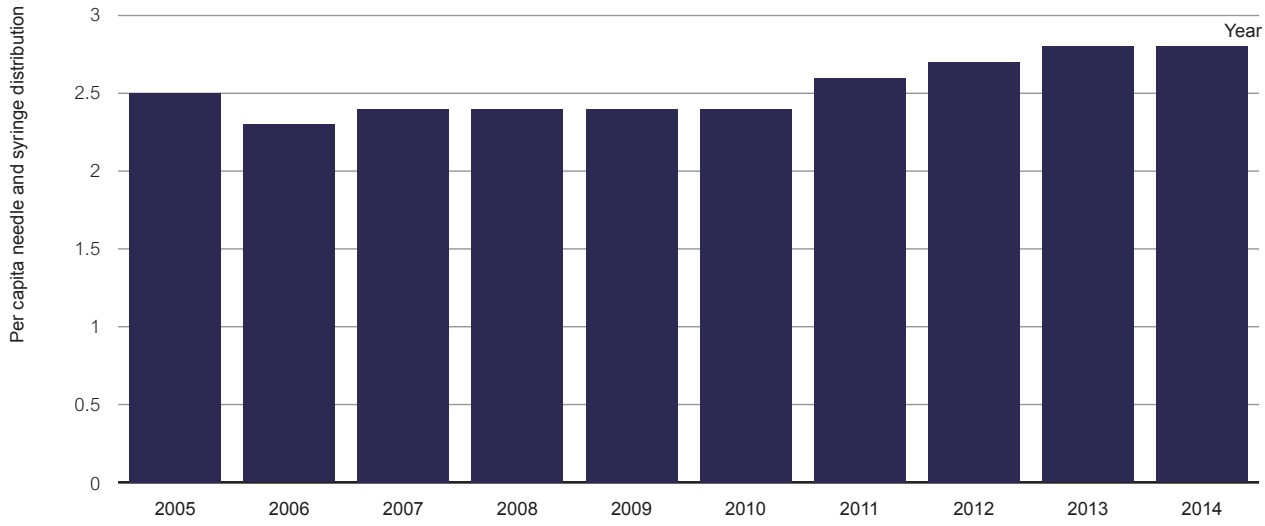
Numerator	Number of needles and syringes distributed by public and pharmacy needle and syringe programs reported by state and territory health departments
Denominator	Australian population aged 15 – 64 years reported by the ABS

Background: The key prevention strategies to protect people who inject drugs from acquiring and transmitting hepatitis C infection are use of sterile needles and syringes and opioid substitution therapy. Australia introduced needle and syringe programs in 1986, and sterile injecting equipment is now provided at more than 3000 NSP sites across the country, including primary and secondary NSP outlets, mobile and outreach services, vending machines, and pharmacies.[16]

Data source and considerations: National needle and syringe distribution data are available from the Needle and Syringe Program Minimum Data Collection; however, there are no recent estimates of the population size of people who inject drugs. A process is currently (2015 – 16) underway to revise these estimates and results should be available for the next report. In the interim, ABS estimates of the general population aged between 15 – 64 years have been used to determine the per capita number of needles and syringes distributed annually.

Results: Between 2013 and 2014, the per capita rate of needle and syringe distribution remained steady (Figure 10). The number of needles and syringes distributed in Australia over the past decade increased from 34 million in 2005 to nearly 44 million in 2014. This translates into an increase over ten years in the per capita number of needles and syringes distributed annually, from 2.5 in 2005, to 2.8 in 2014.

Figure 10 Per capita number of needles and syringes distributed in the previous calendar year, 2005 – 2014



Note: Per capita population aged 15 – 64 years

Source: Needle and Syringe Program Minimum Data Collection

2.2b *Proportion of all injections by people who inject drugs in which a new needle and syringe was used in the previous month*

Indicator definition

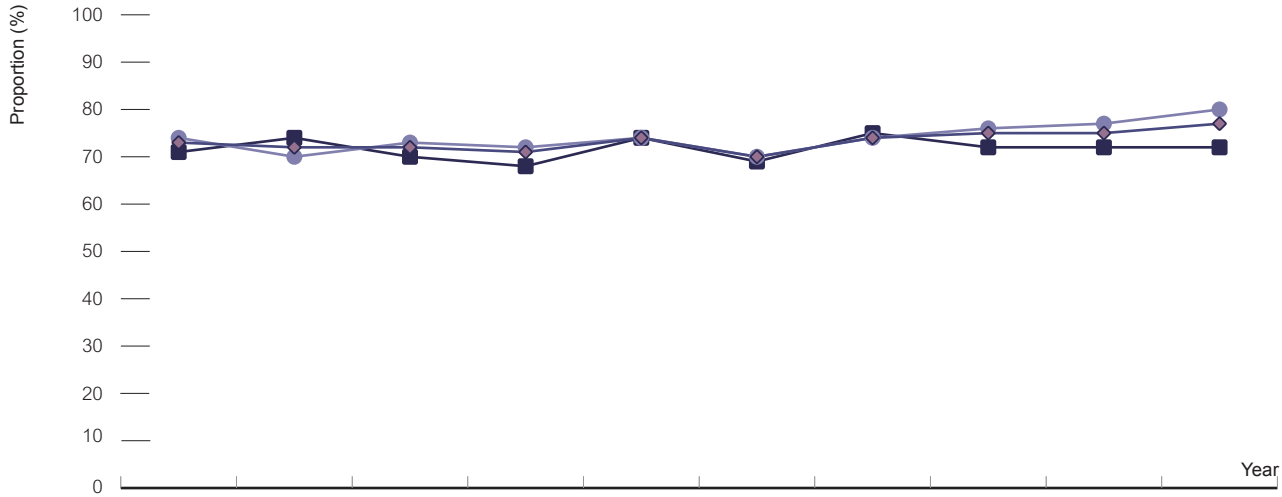
Numerator	Number of ANSPS participants who report using a new needle/syringe for all injections in the month preceding the survey
Denominator	Total number of ANSPS participants who report injecting drugs in the previous month

Background: Coverage is a critical indicator of the effectiveness of interventions such as needle and syringe programs to prevent or control BBV transmission among people who inject drugs. Syringe coverage can be determined at the population level and the individual-level. This indicator focuses on individual-level coverage.

Data source and considerations: The ANSPS is conducted annually and collects data from a large heterogeneous sample of community-based people who inject drugs accessing NSPs from a range of geographical areas across all states and territories. The ANSPS collects data on the use of new needles/syringes for injecting. See Methodological Notes for further detail.

Results: In 2013, 75% of respondents reported using a new needle and syringe for all injections in the previous month, increasing slightly to 77% in 2014. Between 2013 and 2014 the proportion of people who inject drugs who reported using a new needle or syringe for every injection increased slightly among males by 3%, however there was no change for female respondents (Figure 11). Across the ten-year period 2005 – 2014, the proportion of people who inject drugs who reported using a new needle or syringe for all injections in the previous month has slightly increased from 73% in 2005 to 77% in 2014 (Figure 11).

Figure 11 Proportion of all injections by people who inject drugs in which a new needle and syringe was used in the previous month



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	73%	72%	72%	71%	74%	70%	74%	75%	75%	77%
Males	74%	70%	73%	72%	74%	70%	74%	76%	77%	80%
Females	71%	74%	70%	68%	74%	69%	75%	72%	72%	72%

Source: ANSPS

2.2c *Proportion of people who inject drugs reporting re-using another person's used needle and syringe in the previous month.*

Indicator definition

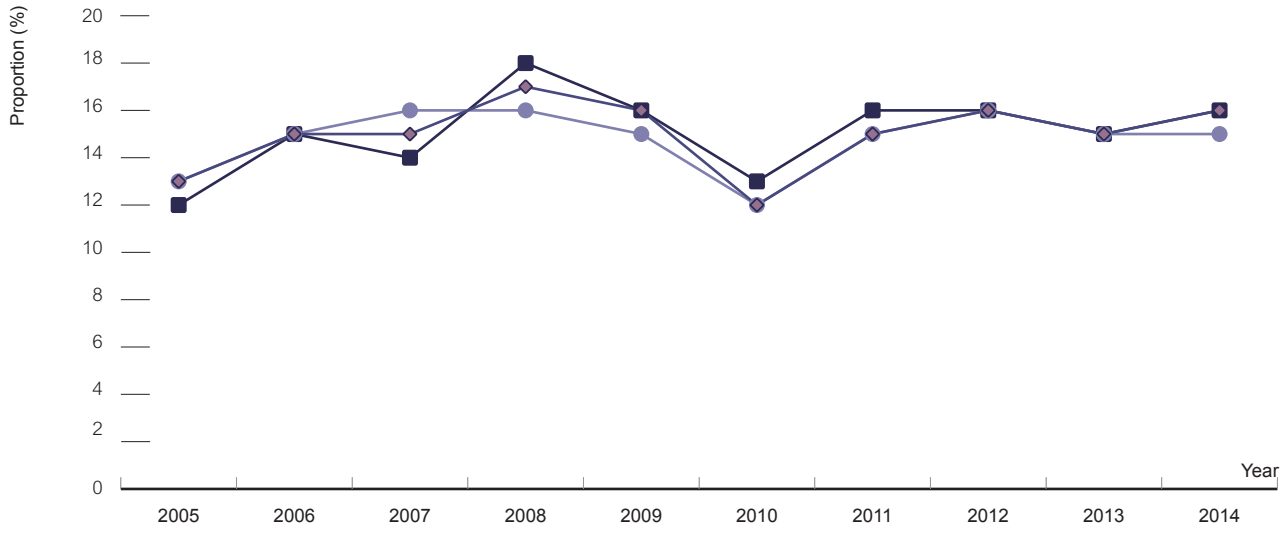
Numerator	Number of ANSPS participants who report re-use of another person's used needle and syringe (receptive syringe sharing) in the month preceding the survey
Denominator	Total number of ANSPS participants who report injecting drugs in the previous month

Background: The re-use of used needles and syringes, or receptive syringe sharing, is a major risk factor for the transmission of HIV, hepatitis and other blood-borne viruses. Monitoring the prevalence of receptive syringe sharing among people who inject drugs is important as it can increase the risk of transmitting and acquiring blood-borne viruses (BBV) such as hepatitis C and HIV.

Data source and considerations: Each year, the ANSPS documents the proportion of participants who report receptive syringe sharing in the month preceding the survey. See Methodological Notes for further detail.

Results: During the period 2005 to 2014, between 12 and 17% of people who inject drugs attending needle and syringe programs reported receptive syringe sharing in the previous month. The proportion was similar in males and females and there was very little change in this key risk behaviour between 2013 and 2014 (Figure 12).

Figure 12 Proportion of people who inject drugs reporting receptive syringe sharing in the previous month



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	13%	15%	15%	17%	16%	12%	15%	16%	15%	16%
Males	13%	15%	16%	16%	15%	12%	15%	16%	15%	15%
Females	12%	15%	14%	18%	16%	13%	16%	16%	15%	16%

Source: ANSPS

2.3 Increase access to appropriate management and care for people with chronic hepatitis C

2.3a Proportion of people with chronic hepatitis C dispensed drugs for their infection in the previous calendar year

Indicator definition

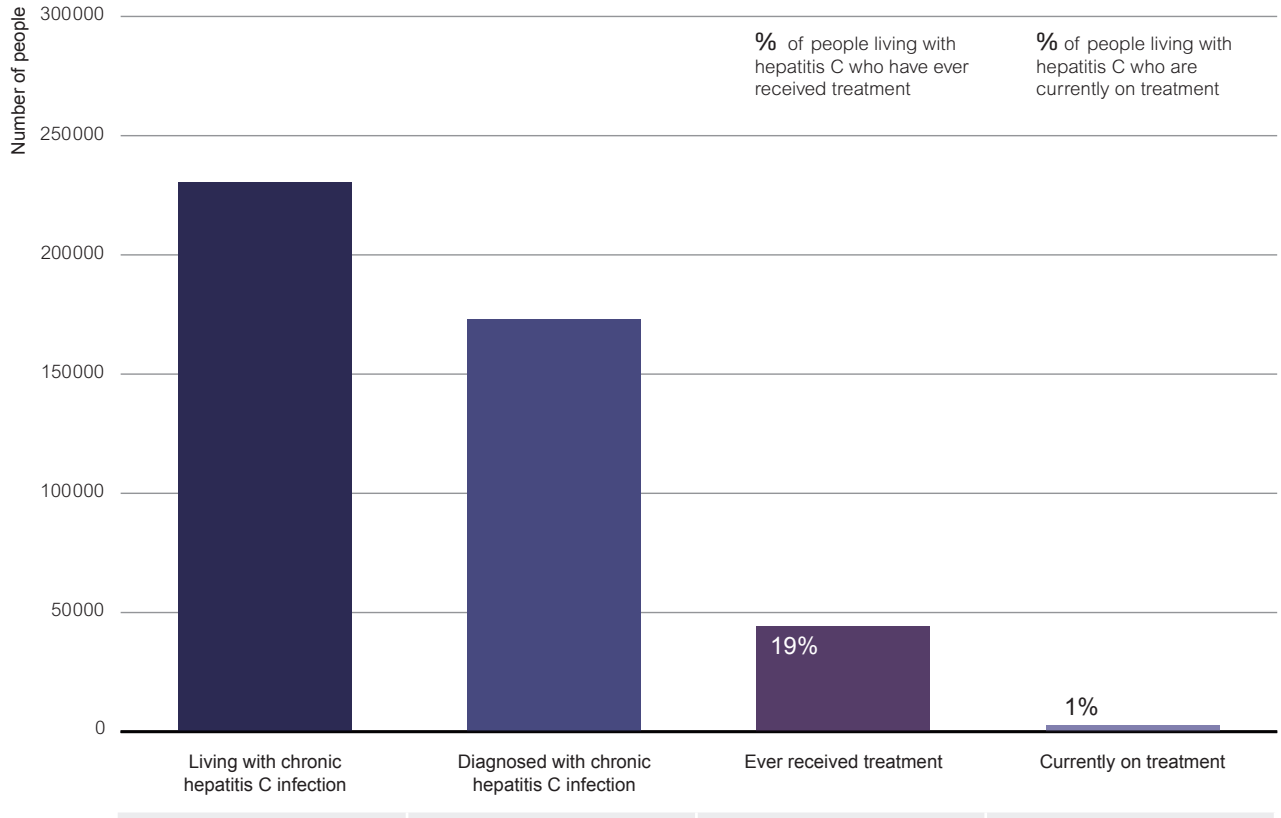
Numerator	Number of individuals dispensed medications for hepatitis C infection
Denominator	Estimated number of people living with hepatitis C infection in Australia

Background: Hepatitis C is a curable infection. Treating hepatitis C reduces an individual's risk of developing chronic liver disease, cirrhosis and hepatocellular carcinoma, and improves quality of life.[17] Also, mathematical modelling suggests treating sufficient current injectors with hepatitis C could reduce disease transmission and lower the overall prevalence and incidence of hepatitis C among people who inject drugs and the general community.[18] Available treatments to date have been limited with poor efficacy and considerable side effects. New DAAs are due to become available on the Australian PBS from 1 March 2016 and many clinicians and patients have delayed starting treatment until these DAAs become available.

Data sources and considerations: This estimate was derived using a difference equation mathematical model produced collaboratively between the Center for Disease Analysis and the Kirby Institute. See Methodological Notes for further detail.

Results: During 2014, an estimated 230 470 (180 490 – 243 990) people were living with chronic hepatitis C, an estimated 44 405 (38 811 – 49 999) have ever been on antiviral therapy and 2 790 were on treatment during that calendar year. This corresponds to 19% (range 17 – 22) of all people with chronic hepatitis C ever having been on antiviral therapy and 1% currently on treatment (Figure 13). During 2013, an estimated 229 280 (178 560 – 242 730) people were living with chronic hepatitis C. Of these 3 540 (2%) people were on treatment during that calendar year. These low numbers on treatment should be interpreted within the context of patients choosing not to initiate existing regimens but waiting for the new DAAs to become available on PBS.

Figure 13 The 2014 hepatitis C diagnosis and care cascade



	Living with chronic hepatitis C infection	Diagnosed with chronic hepatitis C infection	Ever received treatment	Currently on treatment
Estimate	230 470	172 932	44 405	2 790

Source: NNDSS; Center for Disease Analysis; see Methodological Notes for detail

2.3b *Treatment uptake for hepatitis C in people who inject drugs*

Indicator definition

Numerator	Number of ANSPS participants who report any hepatitis C antiviral treatment over lifetime
Denominator	Total number of ANSPS participants who report chronic hepatitis C infection or treatment induced viral clearance

Background: See Section 2.3a

Data source and considerations: The ANSPS is conducted annually and collects data from a large heterogeneous sample of community-based people who inject drugs accessing NSPs from a range of geographical areas across all states and territories. The ANSPS collects data on the lifetime history of hepatitis C antiviral therapy. See Methodological Notes for further detail.

Results: Between 2013 and 2014, the proportion of people who inject drugs participating in the ANSPS reporting a lifetime history of hepatitis C antiviral treatment increased slightly from 11% to 13% (Figure 14).

Figure 14 Proportion of hepatitis C antibody positive people seen at needle and syringe programs who report any hepatitis C antiviral treatment over lifetime, 2008 – 2014

Note: Denominator restricted to people who tested HCV antibody positive and excludes people who self-reported spontaneous clearance
Source: ANSPS

2.3c Recent treatment uptake for hepatitis C in people who inject drugs (additional information)

Indicator definition

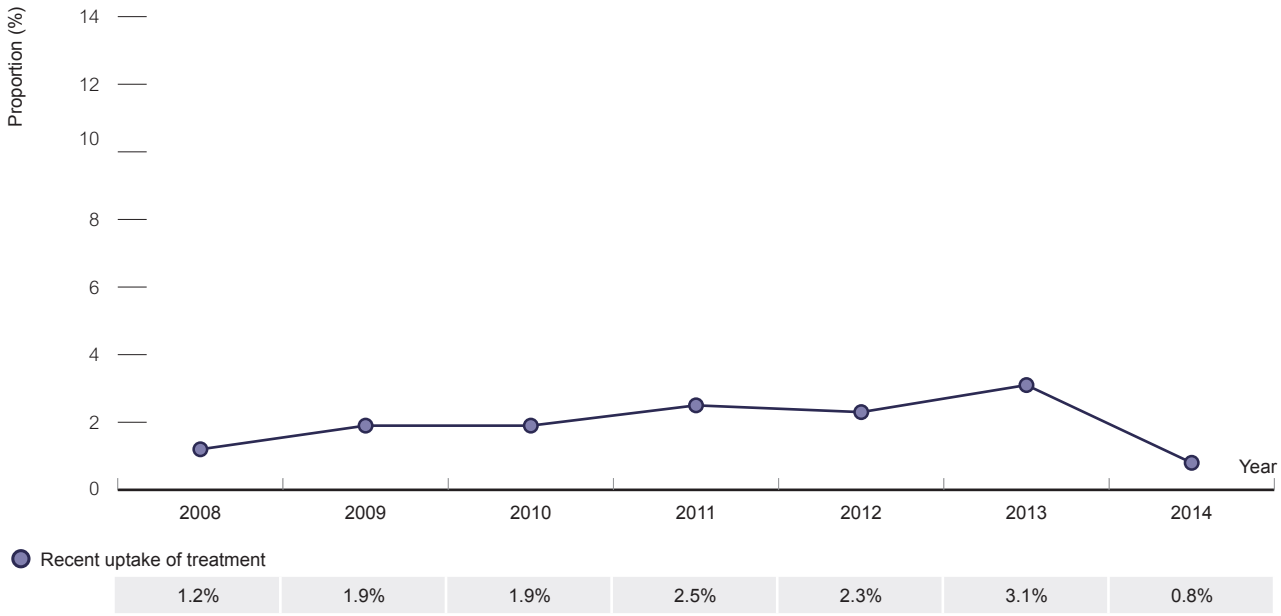
Numerator	Number of ANSPS participants who report hepatitis C antiviral treatment in the previous 12 months
Denominator	Total number of ANSPS participants who report chronic hepatitis C infection or treatment induced viral clearance within the previous 12 months

Background: See Section 2.3a

Data source and considerations: The ANSPS is conducted annually and collects data from a large heterogeneous sample of community-based people who inject drugs accessing NSPs from a range of geographical areas across all states and territories. The ANSPS collects data on recent uptake of hepatitis C antiviral therapy. See Methodological Notes for further detail.

Results: Between 2013 and 2014, the proportion of people who inject drugs participating in the ANSPS reporting recent uptake of hepatitis C antiviral treatment decreased slightly from 3% to 1% (Figure 15).

Figure 15 Recent uptake of hepatitis C antiviral treatment for people who inject drugs



Note: Denominator restricted to people who tested HCV antibody positive and excludes people who self-reported spontaneous clearance
Source: ANSPS

2.4 Reduce the burden of disease attributed to chronic hepatitis C

2.4a The number of people with severe fibrosis/hepatitis C related cirrhosis, and estimated number of deaths (additional information)

Indicator definition

Single measure	Estimated number of people with severe fibrosis/hepatitis C related cirrhosis, and estimated number of deaths

Background: To plan appropriate clinical care and treatment responses to the hepatitis C epidemic, accurate estimates of the rates of hepatitis C infection and its sequelae are essential.

Data source and considerations: The estimated number of people with severe fibrosis/hepatitis C related cirrhosis, and estimated number of deaths are derived using a difference equation mathematical model produced collaboratively between the Center for Disease Analysis and the Kirby Institute. See Methodological Notes for further detail.

Results: At the end of 2014, an estimated 230 470 people had chronic hepatitis C infection, and of these, 185 740 had early to moderate fibrosis (stage F02) and 44 730 had severe fibrosis and hepatitis C related cirrhosis (stage F3/4) (see Table 4), a relative increase of 14% since 2013 with 39 120 severe fibrosis and hepatitis C related cirrhosis cases, and more than double since 2004 (18 580 cases). An estimated 690 deaths attributable to chronic hepatitis C infection occurred in 2014, an increase of nearly 10% since 2013 when there were an estimated 630 deaths and an increase of 146% since 2004 where there were an estimated 280 deaths. This large increase over the last 10 years likely reflects an ageing Australian cohort of people who inject drugs.

Table 4 Estimates of the number of people with severe fibrosis/hepatitis C related cirrhosis, and estimated number of deaths, 2004, 2009, 2013, 2014

	Year			
	2004 (range)	2009 (range)	2013 (range)	2014 (range)
Stage				
Living with chronic hepatitis C infection	287 580 (228 570 – 305 190)	305 190 (240 400 – 323 270)	229 280 (178 560 – 242 730)	230 470 (180 490 – 243 990)
Early to moderate fibrosis	196 100 (152 740 – 208 930)	198 120 (150 950 – 213 200)	188 890 (140 590 – 206 640)	185 740 (138 230 – 203 290)
Severe fibrosis/ hepatitis C related cirrhosis	18 580 (12 650 – 25 850)	29 700 (19 360 – 42 240)	39 120 (24 850 – 55 570)	44 730 (28 440 – 63 800)
Deaths	280 (180 – 370)	430 (280 – 600)	630 (400 – 880)	690 (440 –970)

Source: See Methodological Notes for detail

A further indicator of the extent of illness caused by hepatitis C is the number of liver transplants due to chronic infection. However, caution should be used in interpreting these data as they will be influenced by transplant rates. In 2014, 81 of 224 (36%) people who had a liver transplant had hepatitis C infection, compared to in 85 of the 221 (38%) in 2013.[3]

2.5 Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health

Indicator being developed (see Section 1.6 for further information)

3. Sexually Transmissible Infections

Epidemiology overview

Gonorrhoea: In Australia, gonorrhoea continues to be an infection primarily among men who have sex with men (most residing in urban settings), and of heterosexual Aboriginal and Torres Strait Islander people in remote communities. There were 15 786 cases of gonorrhoea notified in 2014. There were 3 584 (23%) notifications in the Aboriginal and Torres Strait Islander population, and 5 287 (33%) notifications for which Indigenous status was not reported. In 2014, notifications in non-Indigenous people were predominantly in men, and the majority from people residing in urban settings (87%). Among the Aboriginal and Torres Strait Islander population, there were roughly equal numbers of notifications among males and females in 2014, and the majority (77%) resided in remote or very remote areas. The rate of notification of gonorrhoea in the Aboriginal and Torres Strait Islander population was 18 times that in the non-Indigenous population in 2014 (859 vs 49 per 100 000 population).

Infectious syphilis: In Australia, infectious syphilis also continues to be an infection primarily among men who have sex with men (most residing in urban settings), and of heterosexual Aboriginal people in remote and outer regional areas. There were a total of 1 999 infectious syphilis notifications nationally in 2014. There were 235 (12%) notifications in the Aboriginal and Torres Strait Islander population, and 176 (9%) notifications for which Indigenous status was not reported. Infectious syphilis diagnoses in non-Indigenous people were predominantly in men, and 91% resided in urban areas. Among the Aboriginal and Torres Strait Islander population, there were roughly equal numbers of notifications among males and females in 2014, and around half (46%) resided in remote or very remote areas, with a further 38% from outer regional areas. The notification rate of diagnosis of infectious syphilis in the Aboriginal and Torres Strait Islander population in 2014 was four times higher than the notification rate in the non-Indigenous population with an ongoing outbreak of syphilis among Aboriginal and Torres Strait Islander people in Northern Australia.

Chlamydia: Using modelling data, there were an estimated 256 230 chlamydia infections in 15 – 29 year olds (249 000 – 263 470) in 2014. From these modelled data, there were a higher number of new infections in males than females aged 15 – 29 years in 2014 (152 860 vs 103 370), reflecting infections from both heterosexual males and men who have sex with men, and there are higher rates of re-infection in men who have sex with men. The estimated prevalence of chlamydia in young men and women aged 15 – 29 years is 3 – 5%.[19] Nationally, during 2014, there were a total of 86 136 cases of chlamydia notified, with the majority (78%, n=67 446) of diagnoses among 15 – 29 year olds. The 67 446 notifications in 15 – 29 year olds make up only 26% of all the modelled estimated infections, highlighting that notifications only reflect a subset of all chlamydia infections each year. The notification rate of chlamydia in the Aboriginal and Torres Strait Islander population was over three times that in the non-Indigenous population in 2014.

Human papillomavirus (HPV): HPV Infections cause virtually all cases of cervical cancer, the second-most common malignancy in women globally, and are responsible for up to half of a range of other cancers, primarily squamous cell carcinomas.[20, 21] HPV also causes genital warts.[22] Prior to the National HPV Vaccination Program[23] which was implemented for adolescents in 2007, the prevalence of HPV subtypes which cause cervical cancer was 21.3% for HPV16 and 8.4% for HPV18 in 18 – 24 year olds[24] and 11% of Australian-born women, aged 21 years or younger were diagnosed with genital warts.[25] Since the immunisation program commenced there has been over a 90% reduction in diagnosis rates of genital warts in eligible young women, and 82% reductions in genital warts in Australian-born heterosexual men of the same age suggesting herd immunity.[26] The prevalence of vaccine HPV types in women eligible for HPV vaccine has also declined significantly from 29% pre-vaccine implementation to 7% in 2010 – 2012 in a post-vaccine implementation sample.[27]

Donovanosis: Once a regularly diagnosed sexually transmissible infection among remote Aboriginal and Torres Strait Islander populations, donovanosis is now close to elimination in Australia, with only two cases detected since 2011.

Indicator status

Incidence

- The notification rate is used here as a surrogate for incidence (see section 3.2 on data considerations). The gonorrhoea notification rate was stable with a relative 4% change between 2013 and 2014 from 65.7 per 100 000 population in 2013 to 68.5 per 100 000 population, with a long term increase of 75% from 39.2 per 100 000 population in 2005.
- The infectious syphilis notification rate increased by 13% from 7.7 per 100 000 population in 2013 to 8.7 per 100 000 population in 2014, with a long term increase of 172% from 3.2 per 100 000 population in 2005.
- Chlamydia positivity is used here rather than notifications, as positivity accounts for any changes in testing in a population. Chlamydia positivity in 15 – 24 year olds was 12.5% in 2014 similar to the 12.4% in 2013.

Uptake of preventative measures

- High HPV vaccination 3-dose coverage has been achieved in females turning 15 years of age, with 71% coverage in 2013 increasing to 73% in 2014. A vaccination program for adolescent males was introduction in 2013, which achieved 60% coverage in 2014.

Knowledge and risk behaviour

- In 2013 (most recent survey), the proportion of students with knowledge about the transmissibility of asymptomatic infections was high (89%); fewer (60%) were aware that chlamydia affects both men and women; just over half were aware that chlamydia can lead to sterility in women (56%); and less than half (46%) knew that genital herpes results in life-long infection.
- In 2013, less than half (43%) of sexually active students reporting always using a condom in the last twelve months. This proportion increased to 59% in relation to condom use at last sex. Condom use was higher among males than females both in the last twelve months and at last sex.
- A fifth (21%) of year 10 students reported being drunk or high at last sex and almost a quarter (23%) of sexually active students reported three or more sexual partners in 2013, a 7% decrease from 30% in 2008.

Testing

- In sentinel general practice clinics in 2014, only 10% of young people aged 15 – 29 were tested for chlamydia, the same level as 2013.
- The proportion of gay men reporting having had an STI test in the past 12 months was 67% in 2014, similar to levels in 2013 and in the past ten years. The proportion of gay men who reported having had comprehensive STI testing (having at least four different samples collected for STI testing) in the previous 12 months was 40% in 2013, declining slightly to 38% in 2014, but over the past ten years there has been an increase of 26%.

Morbidity

- There were 5 notifications of congenital syphilis in 2014 compared to 7 in 2013, with increases observed in the past ten years coinciding with peaks in infectious syphilis notifications. In 2014 the 5 cases represent a notification rate of 1.7 per 100 000 live births. Elimination targets set by WHO are <50 per 100 000 live births. Data are not available on the other two WHO elimination targets of testing and treatment coverage needed for confirmation of elimination. It is important to note that these targets are for the global elimination of syphilis, and alternative targets may be required for Australia.

Summary: In the first year of the 3rd National STI Strategy, coverage of HPV vaccination in adolescent females remains high (over 70%) and male vaccination coverage was also high (60%), representing a successful story in STI prevention programs. However between 2013 and 2014 there was an increase in infectious syphilis notification rates and chlamydia testing rates remain low. Since around the mid-2000s, laboratories have adopted dual testing, whereby if a test for either chlamydia or gonorrhoea is ordered, both tests are automatically performed. This has led to a substantial rise in the number of gonorrhoea tests being ordered, which may explain the increase in gonorrhoea notifications over the past six years. However as nearly all laboratories are now using dual tests further increases due to this reason would not be expected. Overall, these data emphasise that efforts to increase STI testing and treatment, alongside appropriate health promotion, need to be strengthened.

Objectives and indicators

The Sexually Transmitted Infections Strategy 2014 – 2017 identified six specific objectives, with associated indicators. Progress against these objectives and indicators is outlined in Table 5. Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence. Some *'additional information'* has been included due to data sources becoming available after the Plan was agreed and is marked accordingly.

Main Findings

Table 5 National STI Strategy progress

Theme	Objective	Indicator		2013	2014
Uptake of preventative measures	3.1 Achieve and maintain high levels of HPV vaccination >	3.1	HPV three-dose vaccination coverage for 15 year olds >		
			Females	71%	73%
			Males	*	60%
Incidence and prevalence	3.2 Reduce the incidence of STI >	3.2a	Annual rate of notifications of gonorrhoea (per 100 000 population)[i] >	65.7	68.5
		3.2b	Annual rate of notifications of infectious syphilis (per 100 000 population)[i] >	7.7	8.7
		3.2c	Proportion of chlamydia tests that yield a positive result >		
			15 – 24 year age group	12.4%	12.5%
Knowledge	3.3 Improve knowledge and reduce risk behaviours associated with the transmission of STI >	3.3a	Proportion of secondary school students giving the correct answer to STI knowledge and behaviour questions >		
			i. Potentially asymptomatic nature of many STIs	89%	**
			ii. Chlamydia affects both men and women	60%	**
			iii. Chlamydia can lead to sterility among women	56%	**
			iv. Once a person has genital herpes they will always have the virus	46%	**
		3.3b	*Additional information:* Proportion of secondary school students reporting sexual behaviours >		
			i. Condom use in the last 12 months	43%	**
			ii. Condom use at most recent sex	59%	**
			iii. Drunk or high at last sex	21%	**
			iv. Three or more sexual partners in the past year	23%	**
Testing	3.4 Increase testing among priority populations >	3.4a	Proportion of 15 – 29 year olds receiving a chlamydia test in the previous 12 months (in general practice sentinel surveillance sites) >	10%	10%
		3.4b	Proportion of gay men who report having had an STI test in the previous 12 months >	66%	67%
		3.4c	*Additional information:* Proportion of gay men who report having had comprehensive STI testing in the previous 12 months >	40%	38%
Treatment	3.5 Increase appropriate management and reduce associated morbidity >	3.5	Notifications of congenital syphilis annually >		
			Number	7	5
			Rate per 100 000 live births	2.3	1.7
	3.6 Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health >	Stigma indicator being developed[ii]			

Notification rates are given out of 100,000 population and to 1 decimal place

Percentages (%) are rounded to the nearest whole number

* Data not available as vaccination program in boys commenced in 2013

** Data not available as the National Survey of Australian Secondary School Students and Sexual Health is only conducted every five years

i In the absence of appropriate data for incidence, notifications data have been used, and should be interpreted with caution as a range of factors influence notifications

ii Among people who inject drugs and men who have sex with men and people living with HIV and hepatitis C (which may include people living with hepatitis B infection)

3.1 Achieve and maintain high levels of HPV vaccination

3.1 HPV three-dose vaccination coverage for males and females turning 15 years of age

Indicator definition

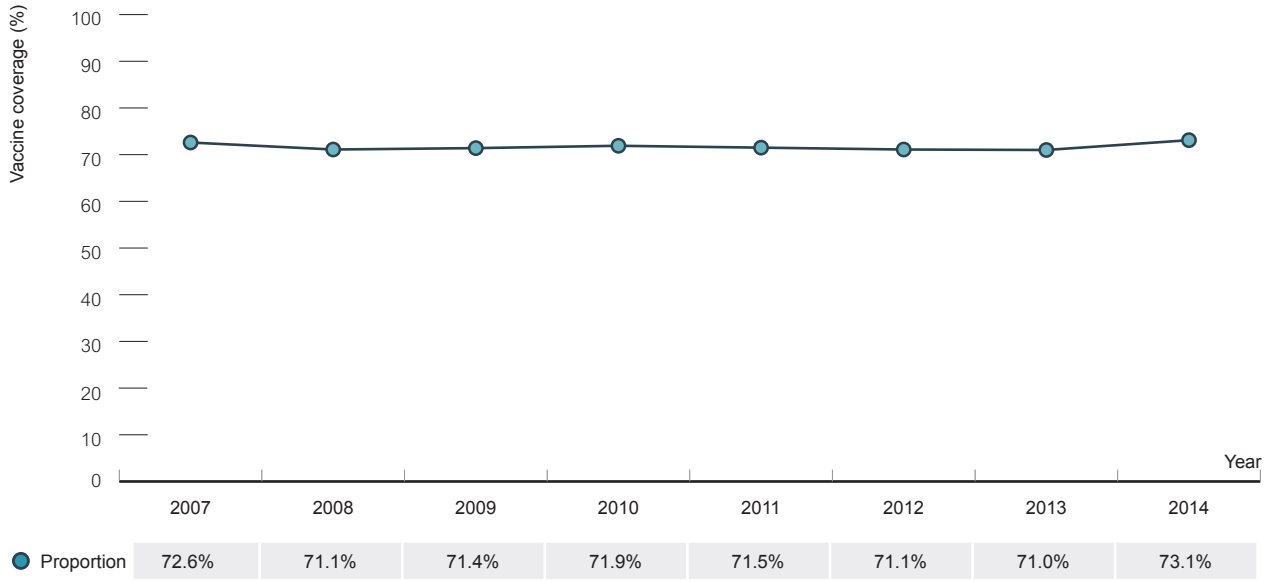
Numerator	Number of males and females turning 15 years of age reported to the NHVPR that comply with the recommended vaccine dosage and administration as per the Australian Immunisation Handbook
Denominator	Number of males and females turning 15 years of age in the Australian population reported by the ABS

Background: The HPV vaccine is provided free in schools to all males and females aged 12 – 13 years under the National HPV Vaccination Program. The National HPV Vaccination Program began in 2007 for females, and was extended to include males in 2013. The government also funded a 2-year catch-up program for 13 to 18 year-old girls in schools and 18 to 26 year-old women through general practice and community-based programs until December 2009.[28] Immunisation programs target the years of early adolescence, prior to the onset of sexual activity, thereby providing protection through the age range of maximum risk. As well as preventing a substantial proportion of cancers and virtually all genital warts, the vaccine prevents pre-cancerous lesions detected by cervical screening programs that would have otherwise required biopsies, surgery or both.

Data source and considerations: HPV vaccination coverage data are derived from the National Human Papillomavirus Vaccination Program Register (NHVPR).[23] The NHVPR monitors and evaluates the HPV vaccination program through the registration of immunisation providers, the creation of individual consumer immunisation records, mailing of completion statements and reminder letters, and the generation of statistical reports on the National HPV Vaccination Program. See Methodological Notes for further detail.

Results: Following the introduction of vaccination against HPV in 2007, high vaccination 3-dose coverage has been achieved in females turning 15 years of age, with 73% in the first year of the program, dropping to 71% in 2013 and increasing back to 73% in 2014 (Figure 16). A vaccination program for boys was introduction in 2013, which achieved 60% coverage in 2014.

Figure 16 Three dose HPV vaccination coverage for all females turning 15 years of age, 2007 – 2014



Source: NHVPR

3.2 Reduce the incidence of STI

3.2a Annual rate of notifications of gonorrhoea

Indicator definition

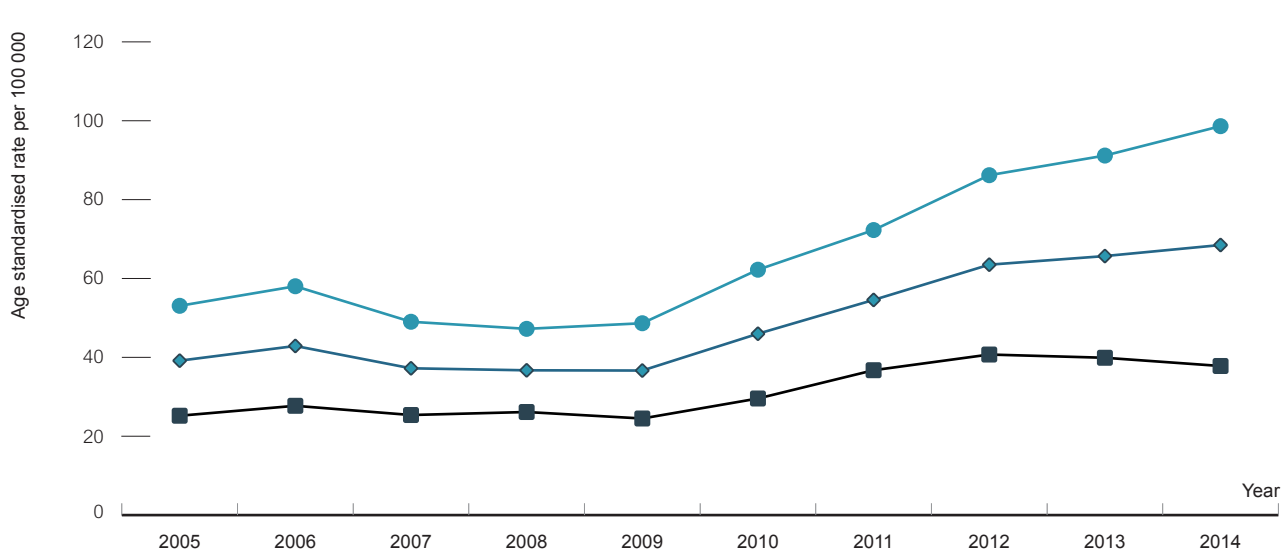
Numerator	Number of notifications of gonorrhoea reported to NNDSS
Denominator	Australian population reported by the ABS

Background: Gonorrhoea is often asymptomatic, and if left untreated, can cause leading to reproductive morbidity, disseminated infection and increase the risk of HIV infection.[29] Timely and appropriate testing is needed to reduce the risk of short and long-term sequelae and onward transmission to sexual partners.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. Data on gonorrhoea are collected against nationally agreed data specifications and reported, by all jurisdictions, to NNDSS. In the past five years most laboratories have switched to using dual chlamydia and gonorrhoea tests where if a chlamydia test was ordered, a gonorrhoea test would be conducted automatically. The emphasis on testing for chlamydia in young people has therefore led to a substantial rise in the number of tests conducted for gonorrhoea. See Methodological Notes for further detail.

Results: The gonorrhoea notification rate was 65.7 per 100 000 population in 2013 and 68.5 per 100 000 population in 2014, a relative 4% increase. Between 2013 and 2014, the notification rate decreased by 5% in females (from 39.9 to 37.8 per 100 000 population), but increased in males by 8% (from 91.2 to 98.6 per 100 000 population) (Figure 17). Over the past 10 years, the national notification rate for gonorrhoea increased by over 75% to 68.5 cases per 100 000 population in 2014 from 39.2 per 100 000 population in 2005.

Figure 17 Gonorrhoea notification rate per 100 000 population, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	39.2	42.9	37.2	36.7	36.7	46.0	54.6	63.5	65.7	68.5
Males	53.1	58.0	49.0	47.2	48.7	62.2	72.3	86.2	91.2	98.6
Females	25.2	27.7	25.4	26.1	24.5	29.6	36.7	40.7	39.9	37.8

Source: NNDSS

3.2b *Annual rate of notifications of infectious syphilis*

Indicator definition

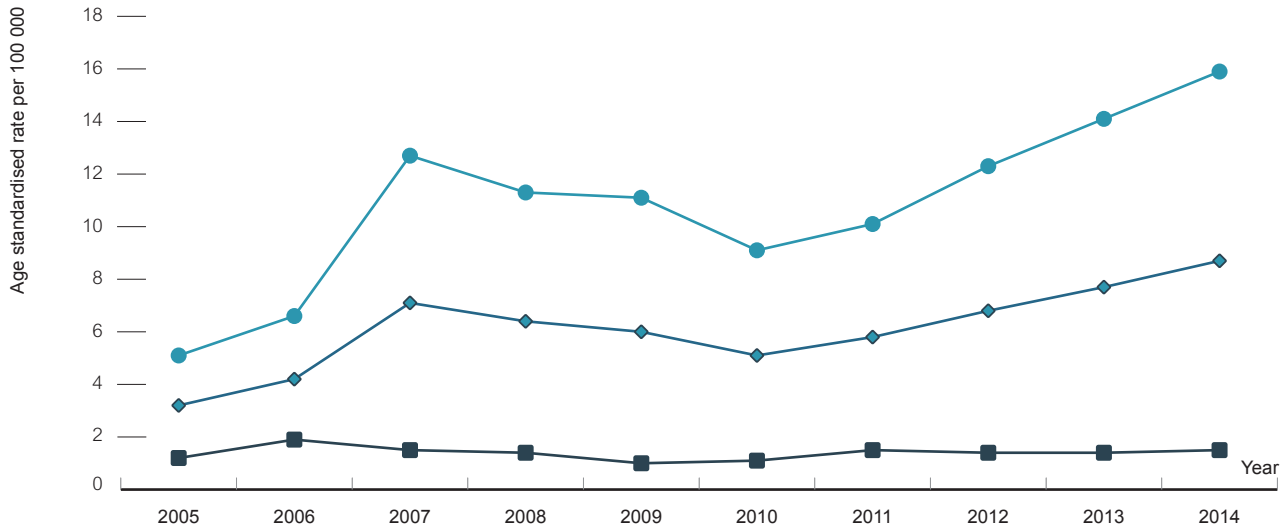
Numerator	Number of notifications of infectious syphilis (less than 2 years duration) reported to NNDSS
Denominator	Australian population reported by the ABS

Background: There are three stages of syphilis infection. Only the first two stages are infectious and symptoms vary according to the stage. The first stage of syphilis (four to 12 weeks) can be missed as there may be no symptoms, or it may occur as a sore (ulcer) on the genital area (including the penis or vagina), anus or the mouth. During the second stage of syphilis (up to two years), there may be a rash, swollen lymph nodes and other non-specific symptoms.[30] Surveillance focuses on monitoring infectious syphilis in Australia.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. Data on infectious syphilis are collected against nationally agreed data specifications and reported, by all jurisdictions, to NNDSS. Classification as infectious syphilis requires laboratory definitive or suggestive evidence of a recent infection, including evidence of a negative test result in the past two years. This two-year period covers primary and secondary stages of syphilis. This definition may exclude some young people who have not had a previous syphilis test. The infectious syphilis case definition was updated in July 2015,[31] to include probable cases that had contact with an infectious case to capture some of these cases. See Methodological Notes for further detail.

Results: The notification rate of infectious syphilis was 7.7 per 100 000 population in 2013 increasing to 8.7 per 100 000 population in 2014. Between 2013 and 2014, the notification rate increased in women by 7% (1.4 to 1.5 per 100 000 population), and in men by 13% (from 14.1 to 15.9 per 100 000 population). Over the past ten years, the notification rate of infectious syphilis among men increased by 213% from 5.1 per 100 000 population in 2005 to 15.9 in 2014 and among women increased slightly from 1.2 to 1.5 per 100 000 population during the same time period (Figure 18). The higher notification rate among males reflects that most cases of infectious syphilis are among men who have sex with men.

Figure 18 Infectious syphilis notification rate per 100 000 population, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	3.2	4.2	7.1	6.4	6.0	5.1	5.8	6.8	7.7	8.7
Males	5.1	6.6	12.7	11.3	11.1	9.1	10.1	12.3	14.1	15.9
Females	1.2	1.9	1.5	1.4	1.0	1.1	1.5	1.4	1.4	1.5

Source: NNDSS

3.2c *Proportion of chlamydia tests that yield a positive result in 15 – 29 year age group*

Indicator definition

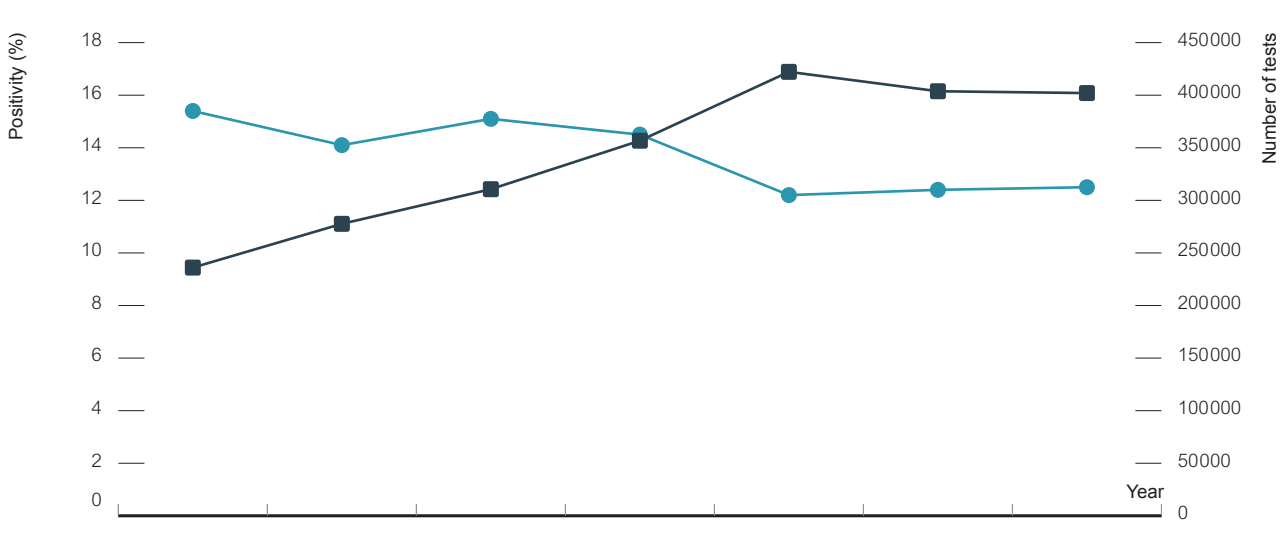
Numerator	Number of notifications of chlamydia in 15 – 29 year olds reported to NNDSS
Denominator	Number of chlamydia tests conducted for 15 – 29 year olds reported to Medicare (item numbers 69316, 69317, 69319)

Background: The NNDSS System involves a passive surveillance system for chlamydia which provides information on an ongoing basis, has wide geographic coverage, is relatively inexpensive and includes basic demographic information.[32] However, changes in notifications need to be considered in the context of testing patterns.[33] While Medicare data do not include testing conducted in government hospital and sexual health services, it provides information more broadly on testing trends, and can be used as a denominator to determine chlamydia positivity.

Data source and considerations: Medicare data provide a reasonable representation of the number of chlamydia tests undertaken in Australia, and a suitable denominator for measuring population level estimates of chlamydia testing rates among young people in general practices.[34] Publicly available Medicare data are only available in ten year age groupings, meaning the data presented below are for 15 – 24 year olds and do not match the indicator specifications. From 2016, data to match the indicator year groups may be available. Data on the number of chlamydia notifications in 15 – 24 year olds come from the National Notifiable Diseases Surveillance System. There is a subset of the population that accesses other services, such as sexual health clinics, that do not require a Medicare card, and are therefore are not Medicare rebated. These patients are more commonly within high-risk populations and have a higher prevalence of chlamydia compared to the general population.[35] Consequently, testing and positivity rates may be underestimated. See Methodological Notes for further detail.

Results: Chlamydia positivity in 15 – 24 year olds remained stable between 2014 and 2013 (Figure 19), but declined since 2008 (from 15.4% to 12.5%).

Figure 19 Number of Medicare rebated chlamydia tests and chlamydia positivity in 15 – 24 year olds, 2008 – 2014



	2008	2009	2010	2011	2012	2013	2014
Positivity	15.4%	14.1%	15.1%	14.5%	12.2%	12.4%	12.5%
Number of tests	236 067	277 669	310 614	356 717	422 205	40 3756	40 2015

Source: Medicare, NNDSS

3.3 Improve knowledge and reduce risk behaviours associated with the transmission of STI

3.3a Proportion of secondary school students giving the correct answer to STI knowledge and behaviour questions

Indicator definition

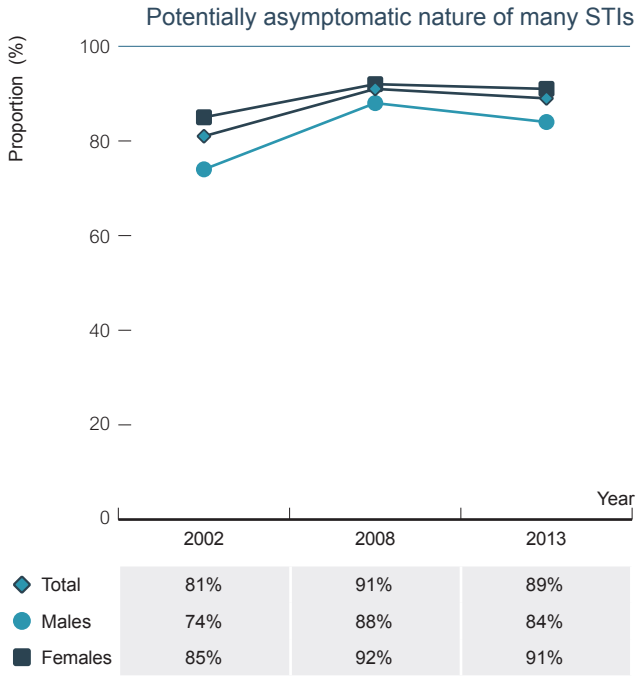
Numerator	Number of SASSH respondents answering STI knowledge questions correctly
Denominator	SASSH respondents (representative of Year 10 students across government, catholic & independent school systems from all jurisdictions)

Background: The provision of sexual health information to populations at risk of STIs may help reduce the incidence of infection by encouraging a reduction in risk behaviours. In particular, exposure to information on methods of transmission, prevention and treatment will help individuals when making specific behavioural choices. The delivery of age-appropriate education within the school curriculum is an important mechanism for improving young people's STI knowledge.

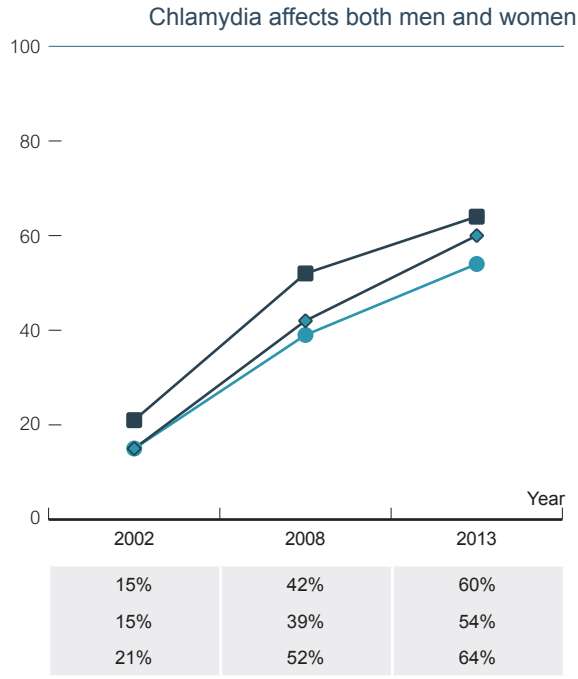
Data source and considerations: The National Survey of Australian Secondary Students and Sexual Health (SASSH)[36] provides a picture of sexual attitudes, knowledge and sexual practices of young Australian people and has been carried out approximately every five years since 1992, with the most recent survey completed in 2013. The survey asks young people about their understanding of STIs. See Methodological Notes for further detail.

Results: The highest levels of student knowledge regarding STIs were demonstrated about the potentially asymptomatic nature of many infections, and lower levels of knowledge were seen in relation to chlamydia and herpes (Figure 20). In 2013, the majority of students knew that someone could still pass on a sexually transmissible infection without having any obvious symptoms (89%). Fewer students were aware that chlamydia affects both men and women (60%) and can lead to sterility amongst women (56%) and that once a person has genital herpes they will always have the virus (46%). Over all, a higher proportion of female students answered STI knowledge questions correctly than their male peers. Compared to 2002, there was an increase in knowledge in all areas except for genital herpes, where the proportion correctly answering decreasing from 51% in 2002 to 46% in 2013 (Figure 20).

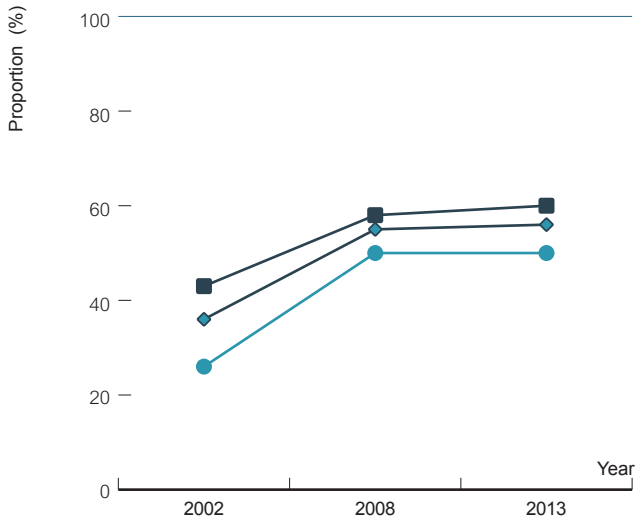
Figure 20 Proportion of secondary school students giving the correct answer to STI knowledge and behaviour questions, 2002, 2008 and 2013, by sex



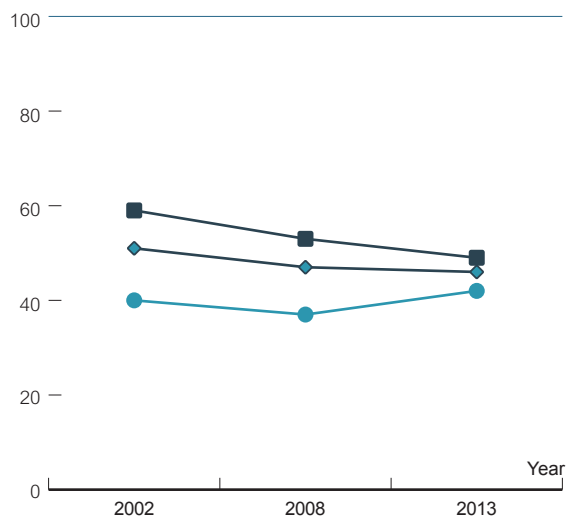
	2002	2008	2013
Total	81%	91%	89%
Males	74%	88%	84%
Females	85%	92%	91%



	2002	2008	2013
Total	15%	42%	60%
Males	15%	39%	54%
Females	21%	52%	64%



	2002	2008	2013
Total	36%	55%	56%
Males	26%	50%	50%
Females	43%	58%	60%



	2002	2008	2013
Total	51%	47%	46%
Males	40%	37%	42%
Females	59%	53%	49%

Source: SASSH

3.3b Proportion of secondary school students reporting certain sexual behaviours (additional information)

Indicator definition

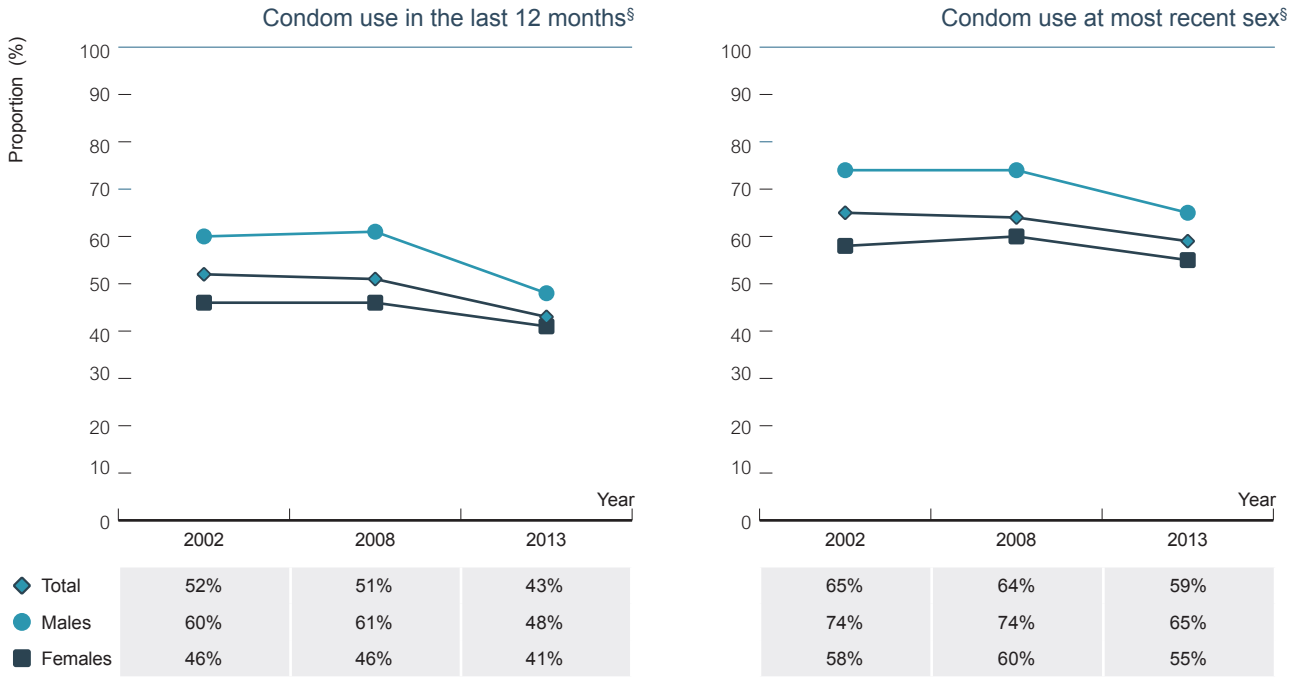
Numerator	Number of SASSH respondents reporting certain sexual behaviours
Denominator	SASSH respondents (representative of Year 10 students across government, catholic & independent school systems from all jurisdictions)

Background: Sexual risk behaviours place adolescents at risk of unintended pregnancies, and sexually transmitted infections, including HIV. Sexual risk behaviours include having unprotected sex, multiple sex partners, and sex under the influence of drugs or alcohol.[37]

Data source and considerations: The National Survey of Australian Secondary Students and Sexual Health (SASSH)[36] asks students questions about sexual behaviour and risk taking. See 3.3a and Methodological Notes for further detail.

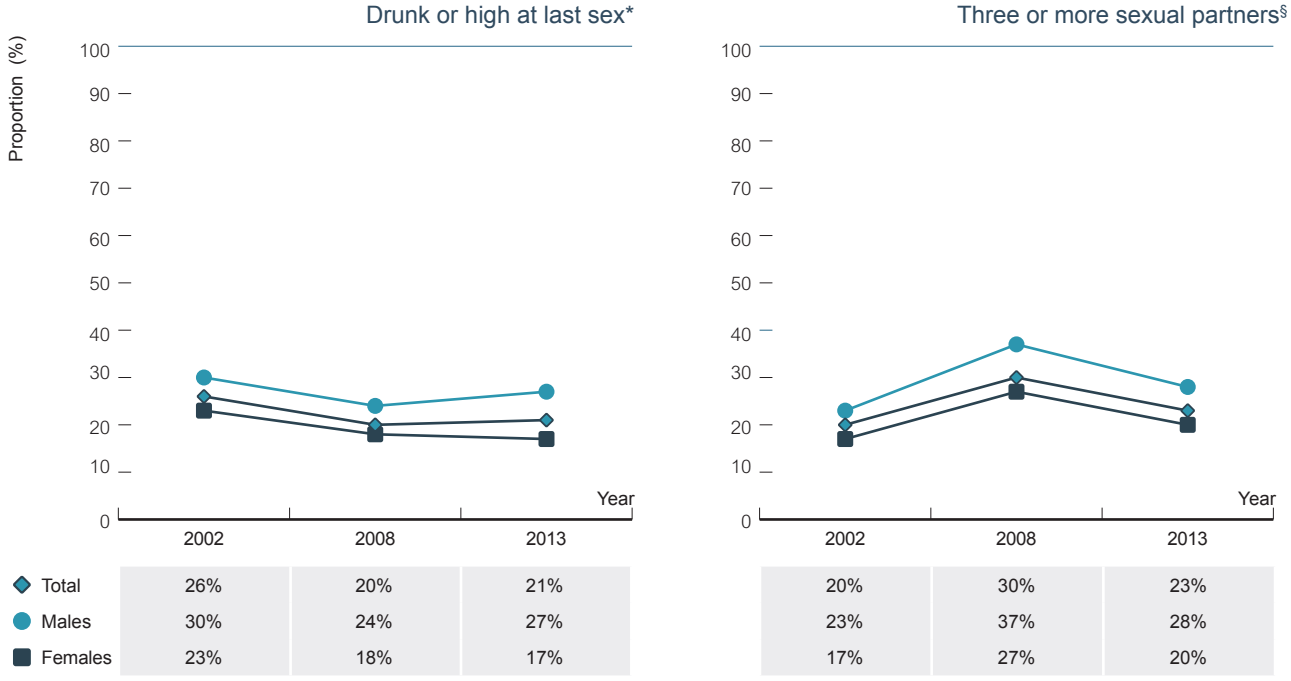
Results: In the most recent year of the survey (2013) the proportion of all sexually active respondents reporting always using a condom when they had sex in the last twelve months was 43%, a decrease from 51% in 2008 and 52% in 2002 (Figure 21). The proportion reporting condom use at last sex was slightly higher at 59% in 2013 but a decline from previous surveys (64% in 2008 and 65% in 2002). Condom use was higher among males than females in all years. A fifth (21%) of year 10 students reported being high or drunk at last sex in the 2013 survey, compared to 20% in 2008 and 26% in 2002. A higher proportion of males reported being drunk or high at last sex. Almost a quarter (23%) of participants reported three or more sexual partners the past year in 2013, a decrease from 30% in 2008, but an increase on 20% in 2002. A higher proportion of males reported three or more sexual partners than females in all three years of the survey.

Figure 21 Proportion of secondary school students reporting key sexual behaviours, 2002, 2008 and 2013, by sex



	2002	2008	2013
Total	52%	51%	43%
Males	60%	61%	48%
Females	46%	46%	41%

	2002	2008	2013
Total	65%	64%	59%
Males	74%	74%	65%
Females	58%	60%	55%



	2002	2008	2013
Total	26%	20%	21%
Males	30%	24%	27%
Females	23%	18%	17%

	2002	2008	2013
Total	20%	30%	23%
Males	23%	37%	28%
Females	17%	27%	20%

§ All sexually active respondents;
* Year 10 students

Source: SASSH

3.4 Increase testing among priority populations

3.4a Proportion of 15 – 29 year olds receiving a chlamydia test in the previous 12 months.

Indicator definition

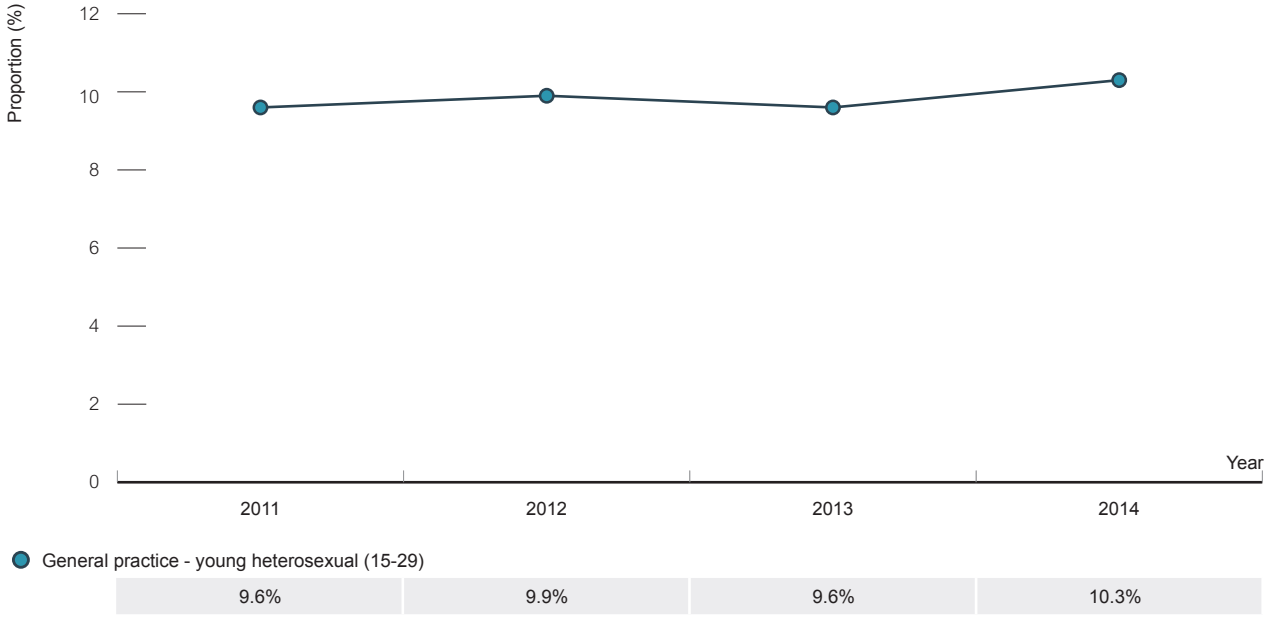
Numerator	Number of individuals aged 15 – 29 years tested at least once in the previous 12 months reported to Medicare (item numbers 69316, 69317, 69319)
Denominator	Australian population aged 15 – 29 years reported by the ABS

Background: About 80% of chlamydia infections are asymptomatic. Untreated chlamydia can lead to reproductive complications such as pelvic inflammatory disease (PID) which in turn increases the risk of ectopic pregnancy and tubal factor infertility.[29] In addition, untreated chlamydia can cause adverse pregnancy and neonatal outcomes,[38] and can enhance the risk of sexual transmission and acquisition of HIV.[39, 40] Therefore, clinical guidelines recommend annual screening for sexually active young males and females aged <30 years and gay and other men who have sex with men.

Data source and considerations: Medicare data on the total number of individuals aged 15 – 29 years who received a chlamydia test in the last 12 months is currently not available; however it will be available from 2016. The data presented comes from the general practice sentinel surveillance network of the ACCESS project. See Methodological notes for further detail.

Results: In 20 general practice clinics located in two jurisdictions in 2014, a low proportion of young people aged 15 – 29 years were tested for chlamydia (10%). There was little change between 2013 and 2014 (Figure 22).

Figure 22 Proportion of 15 – 29 year olds receiving a chlamydia test in the previous 12 months



Source: ACCESS

3.4b *Proportion of gay men who report having had an STI test in the previous 12 months*

Indicator definition

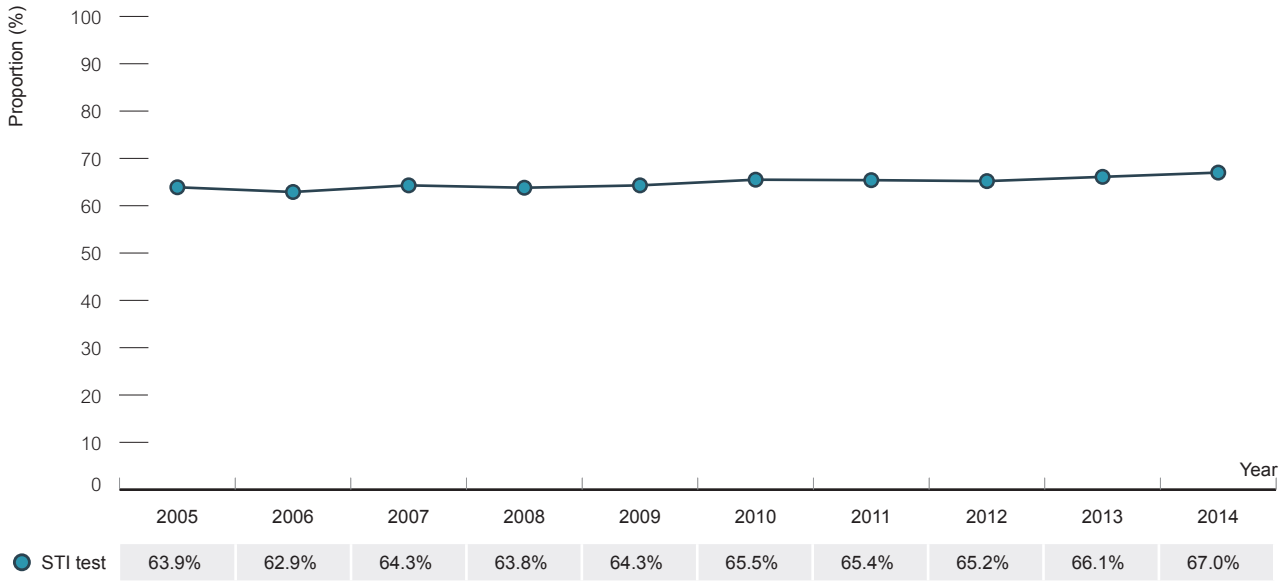
Numerator	Number of gay men who have had an STI test in the previous 12 months reported in GCPS
Denominator	Number of gay men participating in GCPS

Background: Based on the incidence of STIs[41, 42] and the largely asymptomatic nature of infections, clinical guidelines recommend annual screening for sexually active gay and other men who have sex with men and 3 – 6 monthly testing for men at higher-risk indicated by high partner numbers (>10 in 6 months), group sex, use of drugs, being HIV-positive or those reporting unprotected anal sex. STIs have also been associated with increased risk of HIV seroconversion.[43]

Data source and considerations: The Gay Community Periodic Surveys undertake behavioural surveillance monitoring testing and risk behaviour among gay men, and are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). The report is prepared by the Centre for Social Research in Health, UNSW Australia. See Methodological Notes for further detail.

Results: Between 2014 and 2013, the proportion of gay men reporting having had an STI test in the past 12 months remained stable. Over the ten year period 2005 to 2014, the proportion has been fairly stable at between 63% to 67% (Figure 23).

Figure 23 Proportion of gay men who reported an STI test in the past 12 months, 2005 – 2014



Source: GCPS

3.4c *Proportion of gay men who report having had comprehensive STI testing in the previous 12 months (additional information)*

Indicator definition

Numerator	Number of gay men who have had comprehensive STI testing in the previous 12 months reported in GCPS
Denominator	Number of gay men participating in GCPS

Background: STI co-infections are common among gay and bisexual men,[44, 45] therefore clinical guidelines recommend annual comprehensive testing for all men who have sex with another man in the previous year and quarterly testing for all men who have sex with men who have had unprotected anal sex, more than ten sexual partners in six months, participate in group sex, use recreational drugs during sex, or are HIV positive.[46] According to the guidelines, comprehensive testing involves testing for chlamydia, gonorrhoea, syphilis, and where indicated, HIV. This includes specimen collection via swab (chlamydia and gonorrhoea), urine (chlamydia), and blood (syphilis and HIV).[46]

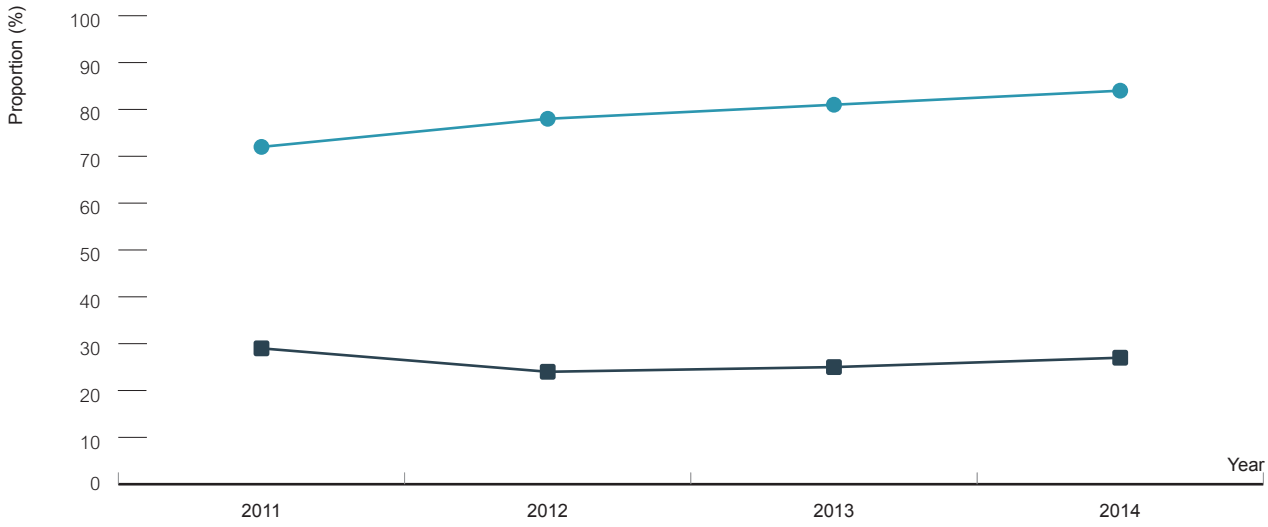
Data source and considerations: The GCPSs are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). Data from 44 sexual health clinics, and four general practice clinics with a high case load of gay men (in Victoria and New South Wales) participating in the ACCESS project, were also used to provide additional information for this indicator. See Methodological Notes for further detail.

Results: Results from the GCPS indicate 40% of gay men reported having at least four samples collected for STI testing (anal swab, throat swab, penile swab, urine, blood test) in the 12 months prior to the survey in 2013, with a 2% absolute decrease to 38% in 2014 (Figure 24). Long term, the proportion has increased over-time by 12% from 26% in 2005. In 2013, 81% of gay and bisexual men attending sexual health clinics were tested for four different infections (chlamydia, gonorrhoea, syphilis, and where indicated, HIV) (Figure 25), increasing slightly in 2014 to 84%. Data available from 2011 indicate this proportion has increased every year, from 72% in 2011 to 84% in 2014. Similar to the GCPS, results from four of the general practice clinics with a high case load of gay men (in Victoria and New South Wales) participating in the ACCESS project, the proportion of gay and bisexual men tested for four different infections was lower, at 25% in 2013 and 27% in 2014.

Figure 24 Proportion of gay men who reported having at least four samples collected for STI testing (anal swab, throat swab, penile swab, urine, blood test) in the 12 month prior to the survey, 2005 – 2014

Source: GCPS

Figure 25 Proportion of gay and bisexual men atteding sexual health clinics and high case load general practice clinic, 2011 – 2014 testing for four different infections (chlamydia, gonorrhoea, syphilis, and where indicated HIV) in a year



	2011	2012	2013	2014
Sexual health clinic	72%	78%	81%	84%
General practice (high case load)	29%	24%	25%	27%

Source: ACCESS

3.5 Increase access to appropriate management for people with STIs and reduce associated mortality

3.5 Number of notifications of congenital syphilis annually

Indicator definition

Single measure	Number of congenital syphilis notifications reported to NNDSS

Background: Transplacental infection with syphilis can occur at any stage of pregnancy and during any stage of maternal disease. Although the majority of congenital syphilis cases are diagnosed at birth, diagnosis can occur at a later stage in life. Untreated maternal syphilis can result in stillbirth/perinatal death, premature delivery or long-term neurological sequelae for half of the survivors. In order to prevent foetal and infant deaths caused by maternal syphilis, the World Health Organization (WHO) has set the following Global Elimination of Congenital Syphilis Targets[47]:

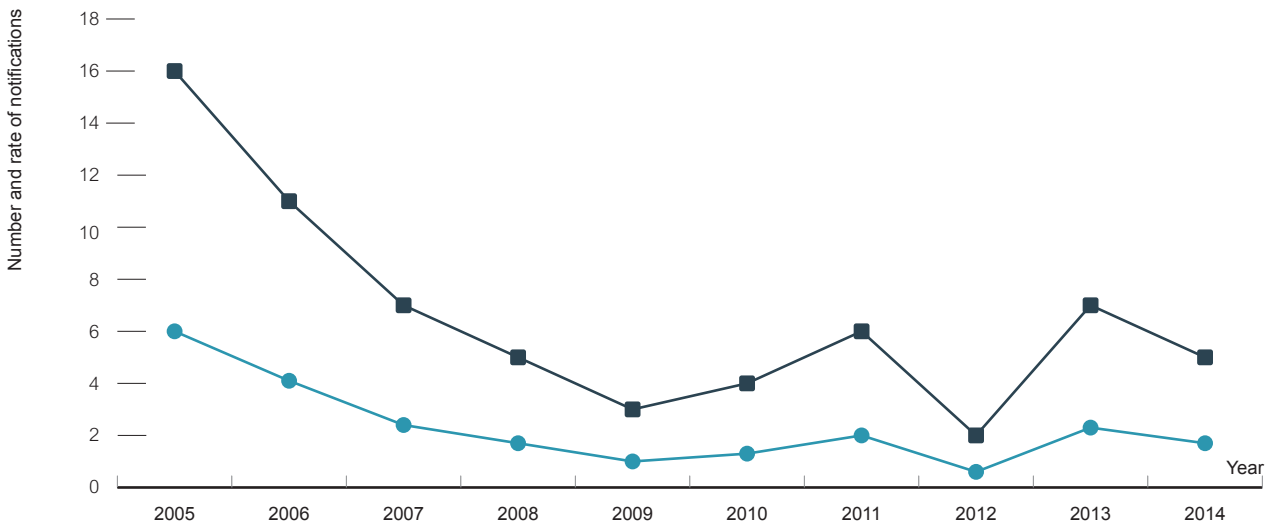
- <50 cases of congenital syphilis per 100 000 live births.
- Coverage of syphilis testing of pregnant women of > 95%
- Treatment of syphilis-seropositive pregnant women of > 95%

It is important to note that these targets are for the global elimination of syphilis, and alternative targets may be more relevant for high income countries like Australia, particularly in the context of a syphilis outbreak in the Aboriginal and Torres Strait Islander population. Syphilis screening at the initial antenatal visit is part of routine obstetric care since women may have asymptomatic latent disease (hidden stage when symptoms associated with early stages of the disease disappear). Some states and territories also recommend further testing, particularly in women considered high risk for acquiring syphilis.

Data source and considerations: Data on congenital syphilis are collected against nationally agreed data specifications and reported, by all jurisdictions, to NNDSS. The number of births is sourced from the Australian Bureau of Statistics 3301.0 Births, Australia, 2014. See Methodological Notes for further detail. Current systems do not currently collect clinical information about congenital syphilis cases.

Results: Five cases of congenital syphilis were reported in 2014. All 5 cases were from the Aboriginal and Torres Strait Islander population (see section 5.2.2). In 2014 this represents a notification rate of 1.7 per 100 000 live births, a relative decrease of 26% compared to a notification rate of 2.3 per 100 000 live births in 2013. Long term notifications of congenital syphilis declined from 16 in 2005 to 3 in 2009, and then increased to 5 in 2014 (Figure 26). See Section 5.2.2 for details of congenital syphilis in the Aboriginal and Torres Strait Islander population.

Figure 26 Annual number of notifications of congenital syphilis, and rate of notifications per 100 000 live births, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of notifications	16	11	7	5	3	4	6	2	7	5
Rate per 100 000 live births	6.0	4.1	2.4	1.7	1.0	1.3	2.0	0.6	2.3	1.7

Source: NNDSS; ABS

3.6 Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health

Indicator being developed (see Section 1.6 for further information)

4. HIV

Epidemiology overview

During 2014, an estimated 27 150 (24 630 – 30 310) people were living with HIV and the majority (88%) or 23 800 (22 480 – 25 050) were diagnosed. Transmission of HIV in Australia continues to occur primarily through sexual contact between men. The annual number of new HIV diagnoses has gradually increased by 13% over the past 10 years, from 953 diagnoses in 2005 to 1 064 in 2012 and stabilised since then with 1 081 cases of HIV infection newly diagnosed in Australia in 2014. Of these newly diagnosed HIV infections, 90% were in males, 70% occurred among men who have sex with men, 5% due to male-to-male sex and injecting drug use, 19% were attributed to heterosexual sex, and 3% to injecting drug use. Australia has a concentrated epidemic among men who have sex with men with results from the Gay Community Periodic survey indicating a prevalence of 14 – 18% among gay men in the past ten years. At 0.1%, the prevalence or overall proportion of people in Australia who have HIV is lower than other comparable high income countries, and countries in the region.

Indicator status

Incidence and prevalence

- In addition to incidence calculations, the notification rate is used here as a surrogate for incidence (see section 4.1c for data considerations). The notification rate of newly diagnosed HIV infection across Australia was stable in the past 3 years (4.7 per 100 000 population, in 2014, 4.5 per 100 000 population in 2013 and 4.7 per 100 000 population in 2012), with a 2% decrease compared to 4.8 per 100 000 population in 2005.
- Estimates of incidence based on repeat testing in gay and bisexual men attending sexual health clinics, show a similar pattern with an incidence rate of 0.78 (95%CI 0.6 – 1.0) per 100 person years in 2013 and 0.81 (95%CI 0.61 – 1.08) per 100 person years in 2014 .
- HIV prevalence continues to be very low among people who inject drugs at 1.7% in 2014 and 2.1% in 2013 (~0.5% if homosexual and bisexual men are excluded), and extremely low among women involved in sex work, with only 1 case in 2013 and no cases detected in 2014, equating to incidence rates of 0.15 (CI 0.05 – 0.47) and 0.00 per 100 person years, respectively.
- Among 38 women with HIV who gave birth in 2014, the transmission to newborns was 0%, as in 2013. There has been a gradual downward trend since 2005 when 11% of infants born to women with HIV were infected.

Uptake of preventative measures

- In 2013 the proportion of gay men reporting unprotected anal intercourse (UAI) with casual male partners was 37% with a 2% absolute increase to 39% in 2014.
- Among people who inject drugs, the proportion re-using someone else's needle and syringe in the previous month was 15% in 2013, similar to the 16% in 2014, and the past ten years.
- Pre-exposure prophylaxis involves the use of antiretroviral therapy for HIV prevention. Uptake is low among high-risk gay and bisexual men eligible for PrEP (according to guideline criteria) at 7.4% in 2013 and 7.1% in 2014. High-risk gay and bisexual men eligible for PrEP accounted for 3% of all GCPS participants in 2014.

Testing

- Among the estimated 27 150 people living with HIV in Australia in 2014, an estimated 12% were living with undiagnosed HIV infection by the end of 2014.
- Based on behavioural surveys, the proportion of gay men who reported having a HIV test in the past year has remained stable in recent years, 61% in 2013 and 62% in 2014 and the proportion of high-risk gay men who reported having 3 or more HIV tests in the past year has also remained stable in recent years, 23% in 2013 and 24% in 2014.
- Based on tests for immune function, over a quarter (28%) of the new HIV notifications in 2014 were determined to be diagnosed late (CD4 count <350 cells/μl), in that they were in people who were likely to have had their infection for at least four years without being tested, which was a decline from the level in 2013 (32%), and since 2005 (32%).

Indicator status (cont.)

Treatment

- Among the estimated 23 800 people diagnosed and living with HIV in Australia, 73% were receiving treatment with antiretroviral therapy. This is an increase of 2% since 2013, when 71% of all people living with diagnosed HIV were on antiretroviral therapy.
- Data from the Australian HIV Observational Database indicate that in 2013 86% of people on treatment had supressed viral load, increasing by 4% to 90% in 2014.

Personal and social impacts

- Self-rating of wellbeing was reported as 'good' or 'excellent' by 63% of respondents in HIV Futures 7 survey (2011 – 12). These proportions were similar to those reported in HIV Futures 6 (2008 – 9).

Summary: In the first year of the 7th National HIV Strategy, the HIV notification and incidence rates remained similar to the previous year. Overall, initiatives to promote testing have achieved high levels of uptake, but there remain gaps in the frequency of testing in high-risk men. Pre-exposure prophylaxis (PrEP) coverage remains low, reflecting limited access through demonstration projects only and personal purchase and importation of drugs from overseas. Although it is estimated that only 73% of people with diagnosed HIV are receiving treatment (the target is 90%) clinical guidelines only changed in 2015 to recommended universal treatment after HIV diagnoses, therefore is it anticipated that over the next few years, there will be an increase in the proportion of people initiating treatment early. Consistent with virtual elimination targets, the prevalence of HIV in people who inject drugs remains low, highlighting the importance of sustaining successful harm reduction strategies. Extremely low maternal transmission has been achieved through comprehensive medical interventions and the incidence rate of HIV among women involved in sex work is extremely low due to successful promotion of safe sex practices. Overall these data highlight the need to maintain and strengthen established strategies of health promotion, testing, treatment and risk reduction, but also expand coverage of new technologies, such as PrEP as they become available.

Objectives and indicators

The National HIV Strategy 2014 – 2017 identified six specific objectives, with associated indicators. Progress against these objectives and indicators is outlined in Table 6. Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence. Some *'additional information'* has been included due to data sources becoming available after the Plan was agreed and is marked accordingly.

Main Findings

Table 6 National HIV Strategy progress

Theme	Objective		Indicator		2013	2014
Incidence and prevalence	4.1	Reduce the incidence of HIV >	4.1a	Recent HIV infection among new HIV diagnoses (proportion acquired within 12 months) >	34%	39%[i]
			4.1b	HIV Incidence rate in gay and bisexual men who test for HIV infection at selected health services (per 100 person-years) >	0.78	0.81
			4.1c	*Additional information:* Annual notification rate of newly diagnosed HIV (per 100 000 population) >	4.5	4.7[i]
		Sustain the virtual elimination of HIV among sex workers	*4.1b*	*Additional information:* HIV incidence rate in female sex workers attending sexual health clinics (per 100 person-years) >	0.15	0.00
		Sustain the virtual elimination of HIV amongst people who inject drugs	*4.1d*	*Additional information:* HIV prevalence among people who inject drugs attending needle syringe programs >		
				All	2.1%	1.7%
				Excluding men with a history of male to male sex	~0.5%	~0.5%
		Sustain the virtual elimination of mother to child transmission of HIV	*4.1e*	*Additional information:* Transmission to newborns among women with HIV who gave birth >	0%	0%
Uptake of preventative measures	4.2	Reduce the risk behaviours associated with the transmission of HIV >	4.2a	Proportion of gay men who have engaged in condomless anal intercourse with casual male partners in the previous six months >	37%	39%
			4.2b	Proportion of people who inject drugs who report re-use of someone else's needle and syringe in the previous month >	15%	16%
			4.2c	*Additional information:* Proportion of high-risk gay men who have received PrEP in the last year >	7.4%	7.1%
Testing	4.3	Decrease the number of people with undiagnosed HIV infection >	4.3a	Proportion of gay men who have been tested for HIV in the previous 12 months >	61%	62%
			4.3b	Proportion of people who inject drugs who have been tested for HIV in the previous 12 months >	50%	49%
			4.3c	Median CD4 cell counts at HIV diagnosis (per µL) >	420 cells	440 cells[i]
			4.3d	*Additional information:* Proportion of high risk gay men who have been tested 3+ times in the previous 12 months >	23%	24%
			4.3e	*Additional information:* Proportion of people living with HIV who are undiagnosed >	12%	12%
			4.3f	*Additional information:* Proportion of new HIV diagnoses determined to be late (CD4 count <350 cell/µL) >	32%	28%[i]

Theme	Objective		Indicator		2013	2014
Treatment	4.4	Increase the proportion of people living with HIV on treatments with an undetectable viral load >	4.4a	Proportion of people living with diagnosed HIV who are receiving antiretroviral treatment >	71%	73%
			4.4b	Proportion of people receiving antiretroviral treatment for HIV infection whose viral load is undetectable (less than 50 copies/mL) >	86%	90%
Personal and social impacts	4.5	Improve quality of life of people living with HIV >	4.5	Proportion of people with HIV who report their general health status and their general well-being to be excellent or good >	*	*
	4.6	Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health >	Stigma indicator being developed[ii]		*	*
		Maintain effective prevention programs targeting sex workers	Indicator not yet identified[iii]		*	*

Notification rates are given out of 100,000 population and incidence rates out of 100 person-years

Rates are given to 1 decimal place if >1/100,000 population or >1/100 person-years and to 2 decimal places if <1/100,000 population or <1/100 person-years

Percentages (%) are rounded to the nearest whole number

* denotes data not available

i Interpretation of these data is not clear without additional knowledge of the context of HIV testing and prevention strategies

ii Among people who inject drugs and men who have sex with men and people living with HIV and hepatitis C

iii HIV prevention among sex workers has been highly successful in Australia and has resulted in HIV incidence rates among the lowest in the world. There is international documentation of the best measures of effective prevention programs,[1] and discussions are ongoing as to the most relevant data to report on this target in Australia

4.1 Reduce the incidence of HIV

4.1a Recent HIV infection among new HIV diagnoses

Indicator definition

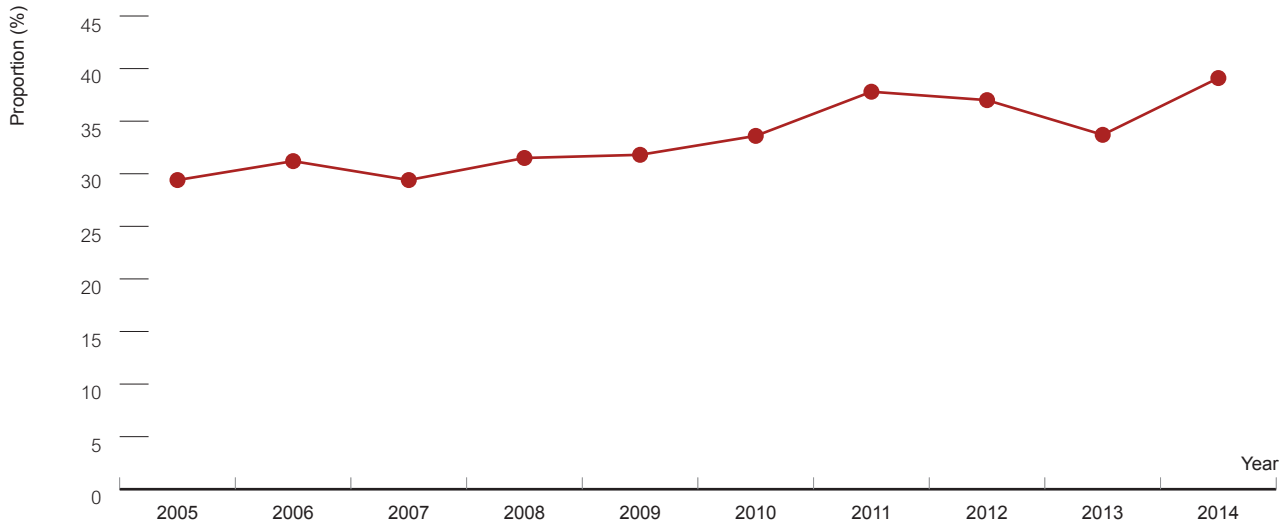
Numerator	Number of newly diagnosed cases with a negative test, onset of primary HIV infection and/or an indeterminate test in less than 365 days
Denominator	Number of newly diagnosed HIV infections recorded in the National HIV Registry

Background: HIV incidence is defined as the number of new HIV infections in a population during a specified time period. Understanding HIV incidence in a population is important to monitor the epidemic, improve the development and implementation of interventions and to evaluate the impact of prevention and treatment programs.[48] Determining the best strategy for measuring incidence remains a challenge. For some newly diagnosed HIV cases, it is possible to determine that they were acquired in the 12 months prior to diagnosis, on the basis of a recent prior negative test or other laboratory and clinical markers.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. HIV infection is a notifiable disease in each State/Territory health jurisdiction in Australia. All new HIV diagnoses are reported by doctors and laboratories to State/Territory health authorities. Details of notifications are then forwarded to the Kirby Institute, UNSW Australia, for inclusion on the National HIV Registry. See Methodological Notes for further detail. Trends in the proportion of diagnoses classified as newly acquired need to be interpreted cautiously as they could reflect increases in regular testing allowing determination of recent infection rather than an increase in actual new infections.

Results: In 2014 39% of newly diagnosed cases of HIV were classified as newly acquired, representing a 5% increase from 34% in 2013. The number of recent HIV infections has been increasing over the last 10 years, from 280 (29% of all new notifications) in 2005, to 370 (38%) in 2011 and 423 (39%) in 2014 (Figure 27). This increase likely reflects increasing testing rates in high risk people.

Figure 27 Proportion of newly diagnosed HIV classified as newly acquired HIV infection, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Newly acquired	29.4%	31.2%	29.4%	31.5%	31.8%	33.6%	37.8%	37.0%	33.7%	39.1%

Source: State and Territory health authorities

4.1b *HIV incidence based on repeat testing*

Indicator definition

Numerator	Number of HIV seroconversions, defined as the midpoint between the last negative and first positive test for HIV
Denominator	Person years at risk, defined as the time between the first and last test in the cohort time period

Background: HIV incidence can be measured in cohorts of people at risk of HIV infection, who are documented as having a negative HIV antibody test at entry into the cohort and are followed up at regular intervals over time to document their HIV status and track potential seroconversion. If cohorts are sufficiently large, and representative of the population group(s) of interest, then robust estimates of incidence can be obtained. However, it is not feasible to recruit and maintain such cohorts for estimating incidence in the Australian population. Instead, cohorts based on routine HIV testing data in populations who test regularly are increasingly being used to measure incidence.

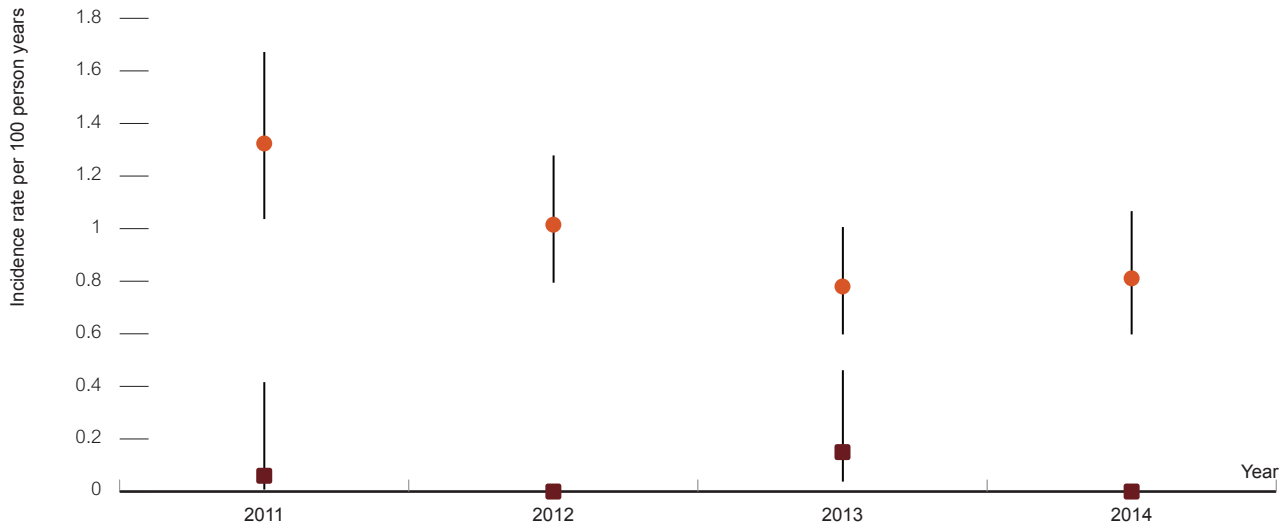
Data source and considerations: Data from 44 sexual health clinics participating in ACCESS enable calculation of HIV incidence in key populations, including gay and bisexual men and female sex workers. HIV incidence is calculated by dividing the number of seroconversions among people undergoing repeat HIV testing at sexual health services by the person's time at risk (determined by the time between repeat HIV tests). Incidence estimates from populations attending sexual health clinics may not be generalisable to the broader populations at risk. See Methodological Notes for further detail.

Results: Estimates of incidence based on repeat testing in gay and bisexual men, show little change between 2013 and 2014 with an incidence rate of 0.78 (95%CI: 0.60 – 1.01) per 100 person-years and 0.81 (95%CI: 0.61 – 1.08) per 100 person-years respectively. Over a four year study period (2011 – 2014) among 11 145 gay and bisexual men attending sexual health services who had a repeat HIV test, there were 240 seroconversions in 25 000 person years at risk, equating to an overall HIV incidence rate of 0.96 (95%CI: 0.85-1.09) per 100 person-years. The HIV incidence per 100 person years was highest in 2011 at 1.32 (95%CI: 1.04-1.69) declining to 1.02 in 2012 (95%CI: 0.80-1.29), 0.78 (95% CI: 0.6-1.0) in 2013 and 0.81 (95% CI: 0.61-1.08) in 2014 (Figure 28). It is important to note the confidence intervals between these estimates overlap.

HIV incidence remains extremely low among women involved in sex work, with only 1 case among women tested in 2013 and no cases detected in 2014, equating to incidence rates of 0.15 (95%CI: 0.05 – 0.47) and 0.00 per 100 person years respectively (Figure 28). Among female sex workers attending sexual health services who had at least one repeat HIV test (3 266) during the four year study period, there were only 2 HIV seroconversions in 3 044 person years at risk, equating to an overall HIV incidence rate of 0.07 (95%CI: 0.02 – 0.26) per 100 person-years.

In 2016, the above HIV incidence analyses will include data from primary care clinics also.

Figure 28 HIV incidence rate per 100 person years in gay and bisexual men and female sex workers attending sexual health clinics, 2011 – 2014



	2011	2012	2013	2014
Gay and bisexual men	1.32	1.02	0.78	0.81
Female sex workers	0.06	0.00	0.15	0.00

Source: ACCESS

4.1c Annual notification rate of newly diagnosed HIV (additional information)

Indicator definition

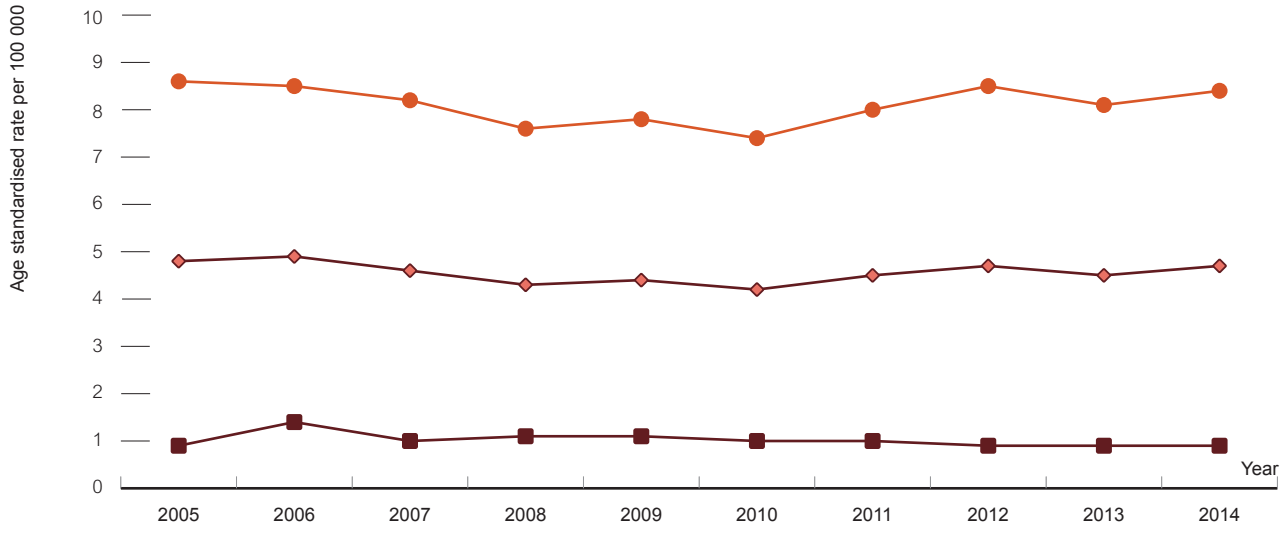
Numerator	Number of newly diagnosed HIV infections recorded in the National HIV Registry
Denominator	Australian population reported by the ABS

Background: Reported numbers of diagnoses of HIV can be used to monitor the trends of transmission in Australia. However, trends in diagnoses may only reflect trends in incidence if testing is relatively frequent and rates of testing are relatively constant among people at risk of HIV infection.

Data sources and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. HIV infection is a notifiable disease in each State/Territory in Australia. All new HIV diagnoses are reported by doctors and laboratories to State/Territory health authorities. See Methodological Notes for further detail.

Results: The HIV notification rate was 4.5 per 100 000 population in 2013 and 4.7 per 100 000 population in 2014 (a relative 4% increase). From 2013 to 2014, there was a relative 4% increase in the notification rate in males (from 8.1 to 8.4 per 100 000 population) whereas the rate among females remained the same (0.9 per 100 000 population in both years).The trend in the population notification rate of newly diagnosed HIV infection across Australia has remained fairly stable at 4.8 per 100 000 population in 2005 to 4.7 per 100 000 population 2014 (Figure 29).

Figure 29 Newly diagnosed HIV notification rate per 100 000 population, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	4.8	4.9	4.6	4.3	4.4	4.2	4.5	4.7	4.5	4.7
Male	8.6	8.5	8.2	7.6	7.8	7.4	8.0	8.5	8.1	8.4
Female	0.9	1.4	1.0	1.1	1.1	1.0	1.0	0.9	0.9	0.9

Source: State and Territory health authorities

The HIV targets 3, 4 and 5 (Sustain the virtual elimination of HIV among sex workers; Sustain the virtual elimination of HIV amongst people who inject drugs; and Sustain the virtual elimination of mother to child transmission of HIV) do not have specific indicators; however additional data has been presented in 4.1b (above) and 4.1d and 4.1e (below) to support the progress in these areas.

4.1d *HIV prevalence among people who inject drugs attending needle syringe programs (additional information)*

Indicator definition

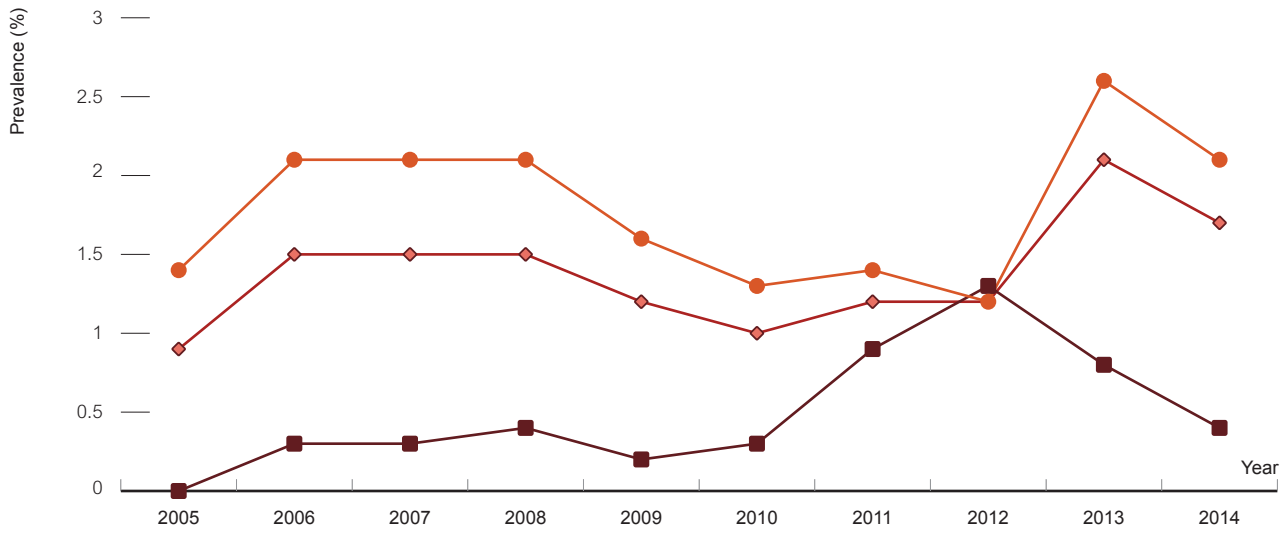
Numerator	Number of people testing positive for HIV among people who inject drugs attending needle and syringe programs
Denominator	Number of people who inject drugs attending needle and syringe programs

Background: HIV prevention among people who inject drugs has been highly successful in Australia and has resulted in sustained low HIV prevalence. People who inject drugs remain a priority population because of the potential for an increase in HIV transmission; for example, through changes in the availability of clean injecting equipment.

Data source and considerations: The ANSPS is conducted annually over a two week period, and collects data from a large heterogeneous sample of community-based people who inject drugs accessing Needle and Syringe Programs (NSP) from a range of geographical areas across all states and territories. See Methodological Notes for further detail.

Results: In 2014, HIV prevalence among people who inject drugs remained low at 1.7% similar to 2.1% in 2013 (Figure 30). Prevalence was higher in 2014 among males (2.1%) compared to females (0.4%). When homosexual and bisexual men were excluded, HIV prevalence in 2014 among people who inject drugs was ~0.5% (data not shown).

Figure 30 HIV prevalence among people who inject drugs attending needle and syringe programs, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total*	0.9%	1.5%	1.5%	1.5%	1.2%	1.0%	1.2%	1.2%	2.1%	1.7%
Males	1.4%	2.1%	2.1%	2.1%	1.6%	1.3%	1.4%	1.2%	2.6%	2.1%
Females	0.0%	0.3%	0.3%	0.4%	0.2%	0.3%	0.9%	1.3%	0.8%	0.4%

* Includes transgender

Source: ANSPS

4.1e HIV transmission to newborns perinatally exposed to HIV (additional information)

Indicator definition

Numerator	Number of HIV positive infants born to HIV positive mothers
Denominator	Number of infants born to HIV positive mothers

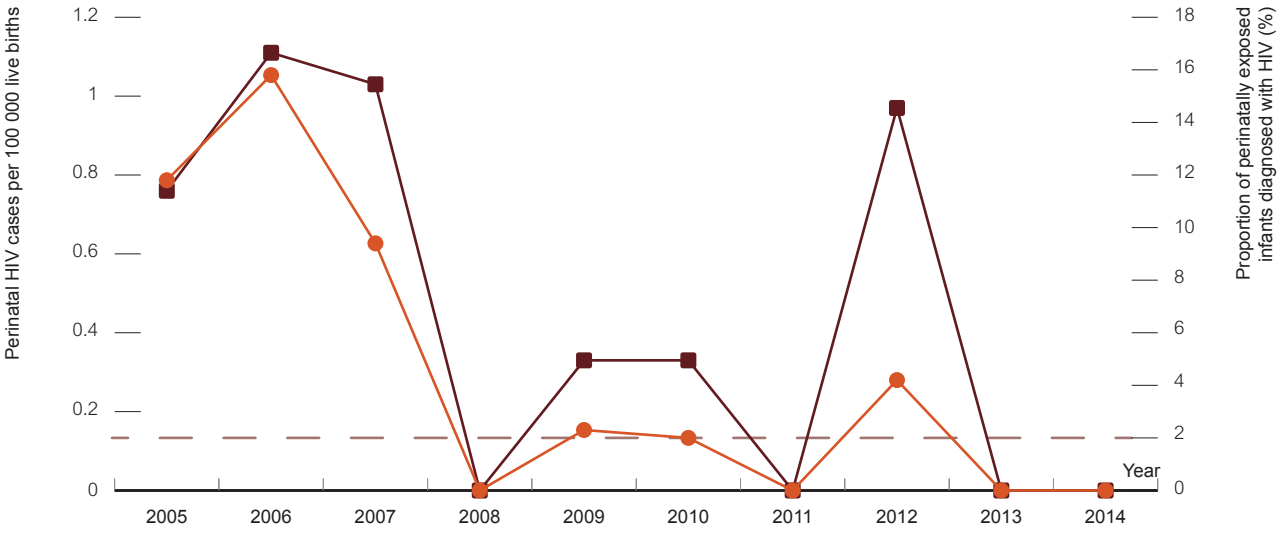
Background: The internationally endorsed strategy of early testing and treatment has the potential to eliminate mother-to-child-transmission (MTCT) of HIV in countries where treatment coverage is high. In order to prevent MTCT, the World Health Organization (WHO) has set the following Global Elimination of Mother to Child Transmission of HIV Targets[47]:

- New paediatric HIV infections due to mother-to-child transmission of HIV are less than 50 cases per 100 000 live births
- Mother-to-child transmission rate of HIV is less than 5% in breastfeeding populations or less than 2% in non-breastfeeding populations
- More than 95% of pregnant women, both who know and do not know their HIV status, received at least one antenatal visit
- More than 95% of pregnant women know their HIV status
- More than 95% of HIV-positive pregnant women receive antiretroviral drugs

Data source and considerations: Data from the Australian Paediatric Surveillance Unit (APSU) is recorded in the Australian Perinatal HIV Surveillance System. Paediatricians and other child health professionals participating in the APSU notify infants born to HIV-positive mothers. Further information is then sought including demographics of infant and mother, maternal HIV exposure risk, HIV prevention interventions used (antiretroviral therapy (ART), mode of delivery, breastfeeding status) and the infant's HIV status.

Results: There were no cases of HIV amongst perinatally exposed infants born in Australia in 2014, sustaining the virtual elimination of mother to child HIV transmission seen in 2013. The rate per 100 000 live births was 0.00 in 2014, the same as in 2013 (Figure 31).

Figure 31 Mother-to-child transmission of HIV, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Perinatal HIV cases per 100 000 live births										
Total	0.76	1.11	1.03	0.00	0.33	0.33	0.00	0.97	0.00	0.00
Proportion of perinatally exposed infants diagnosed with HIV										
	11.8%	15.8%	9.4%	0.0%	2.3%	2.0%	0.0%	4.2%	0.0%	0.0%

Note: The broken line indicates the WHO target of 2% mother-to-child transmission

4.2 Reduce the risk behaviours associated with the transmission of HIV

4.2a Proportion of gay men who have engaged in condomless anal intercourse (CLAI) with casual male partners in the previous six months

Indicator definition

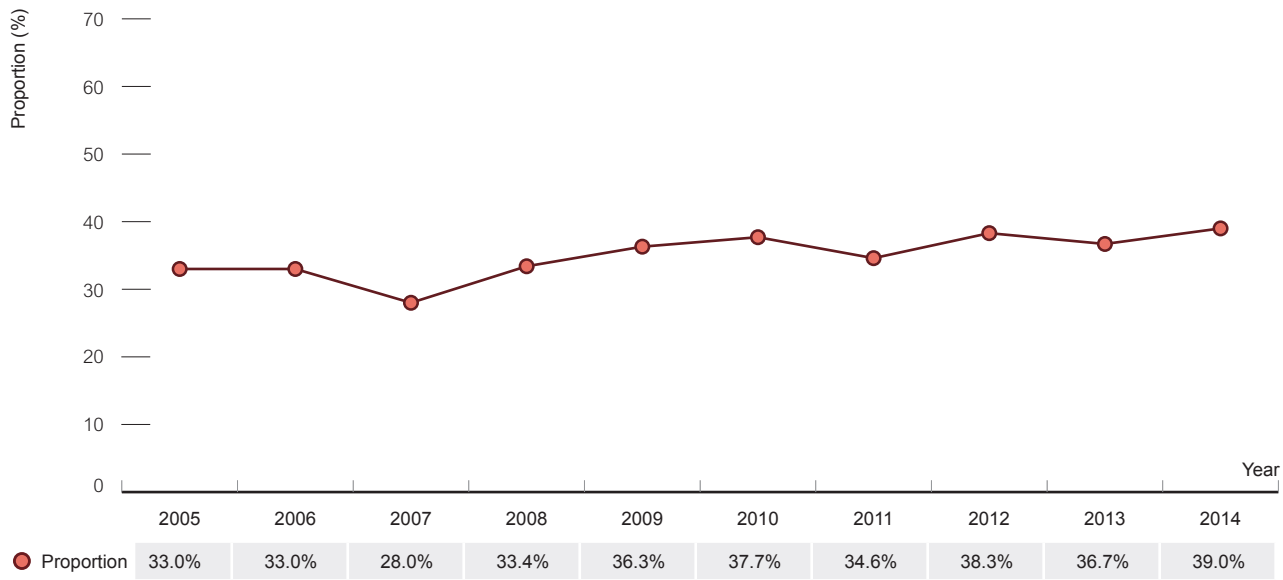
Numerator	Number of participants in Gay Community Periodic Surveys who report any CLAI with casual male partners in previous six months
Denominator	Number of participants in Gay Community Periodic Surveys Number of newly diagnosed HIV infections recorded in the National HIV Registry

Background: In Australia, condomless anal intercourse with casual partners is a key risk factor for HIV infection in gay and other men who have sex with men and a reliable indicator of subsequent trends in HIV infection.[49] However it is important to note that these men may not all be at risk of HIV infection due to adoption of other risk reduction strategies, such as sero-sorting, PrEP and antiretroviral treatment in men with HIV.

Data source and considerations: The Gay Community Periodic Surveys are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). See Methodological Notes for further detail.

Results: Results from the GCPSs indicate about a third of gay men with casual partners report condomless anal intercourse in the previous six months. Between 2013 and 2014 the proportion has increased by 2% from 37% to 39% respectively (Figure 32). Conversely, this means about two-thirds of men with casual partners use condoms or avoid anal sex entirely. Further information regarding sexual risk behaviour appears in the Annual Report of Trends in Behaviour 2015, prepared by the Centre for Social Research in Health.

Figure 32 Proportion of gay men with casual partners who reported any condomless anal intercourse in the six months prior to the survey, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Proportion	33.0%	33.0%	28.0%	33.4%	36.3%	37.7%	34.6%	38.3%	36.7%	39.0%

Source: GCPS

4.2b *Proportion of people who inject drugs who report re-use of someone else's needle and syringe in the previous month.*

Indicator definition

Numerator	Number of ANSPS participants who inject drugs who report re-using another person's used needle and syringe (receptive syringe sharing) in the previous month
Denominator	Total number of ANSPS participants

Background: Monitoring risk behaviours among people who inject drugs is essential to ensure that an HIV epidemic does not emerge among this priority population.

Data source and considerations: The ANSPS is conducted annually over a two week period, and collects data from a large heterogeneous sample of community-based people who inject drugs accessing Needle and Syringe Programs (NSP) from a range of geographical areas across all states and territories. See Methodological Notes for further detail.

Results: The proportion of people who inject drugs seen through the Australian Needle and Syringe Program Survey, who reported receptive syringe sharing, has remained stable over the past 10 years at around 15% (see Figure 12, Section 2.2).

4.2c *Proportion of high-risk gay men who have received PrEP in the last year (additional information)*

Indicator definition

Numerator	Number of high-risk gay men who received PrEP for HIV in the previous twelve months, reported in GCPS
Denominator	Number of high-risk gay men participating in GCPS

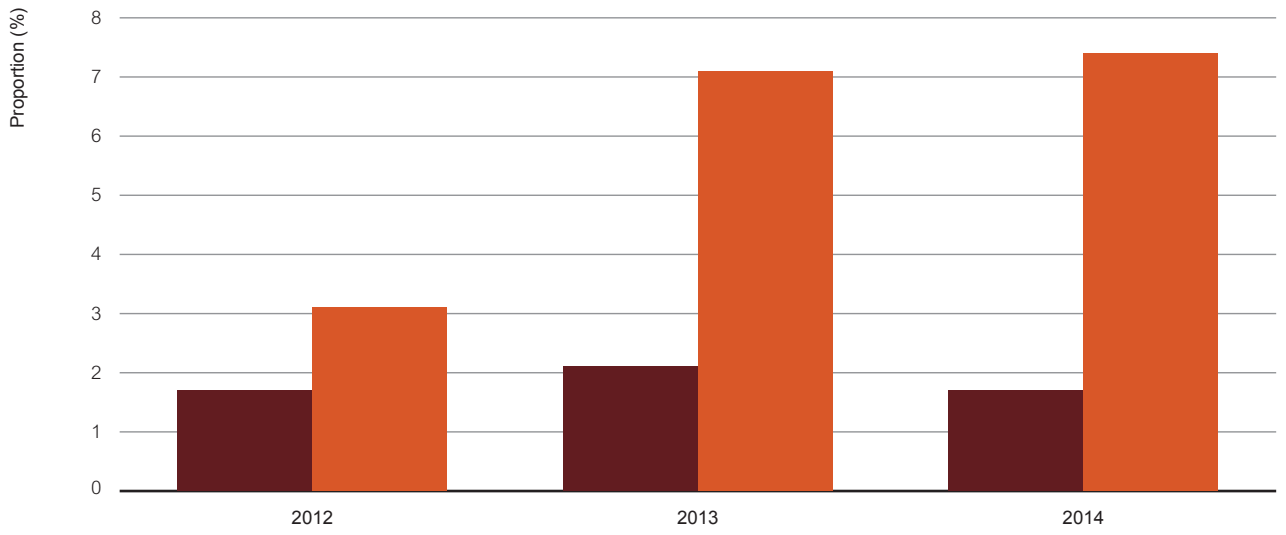
Background: Pre-exposure prophylaxis (PrEP) involves a combination of antiretrovirals taken before exposure to HIV to prevent HIV infection. Published efficacy studies have shown that among men who have sex with men who took tablets every day (adherent) the drugs were 95% effective. In Australia, PrEP is not currently registered by the Therapeutic Goods Administration (TGA) and not listed on the Pharmaceutical Benefits Scheme (PBS). The high cost of drugs is an ongoing issue and current access to PrEP is largely through demonstration projects funded by some states/territories or by people personally funding and importing PrEP from overseas.

Data source and considerations: The GCPSs are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). See Methodological Notes for further detail. For this indicator, high-risk is defined according to criteria in national guidelines; anyone likely to have multiple events of condomless anal intercourse, with or without sharing intravenous drug use, in the next three months, and report any of the following: non-HIV-positive men who reported any condomless sex with a positive or unknown status regular partner in the last three months, any condomless sex with casual HIV-infected partner or partner of unknown status in the last three months, more than 10 male partners in the last six months, any STI diagnosis in the last three months, or methamphetamine use in the last three months.

Results: Results from the GCPSs indicate that overall among non HIV-positive men in Australia, that PrEP use is minimal and there has been very little change between 2012 and 2014 (Figure 33). Uptake of PrEP among high-risk gay and bisexual men eligible according to guideline criteria is very low (3% of all non-HIV-positive men), although it has increased very slightly between 2013 and 2014 from 7.1% to 7.4% (Figure 33).

HIV

Figure 33 PrEP use reported by all non-HIV positive and high-risk participants in the Gay Community Periodic Survey, 2012 – 2014



	2012	2013	2014
All non-HIV positive men	1.7%	2.1%	1.7%
High-risk men	3.1%	7.1%	7.4%

Source: GCPS

4.3 Decrease the number of people with undiagnosed HIV infection

4.3a Proportion of gay men who have been tested for HIV in the previous 12 months

Indicator definition

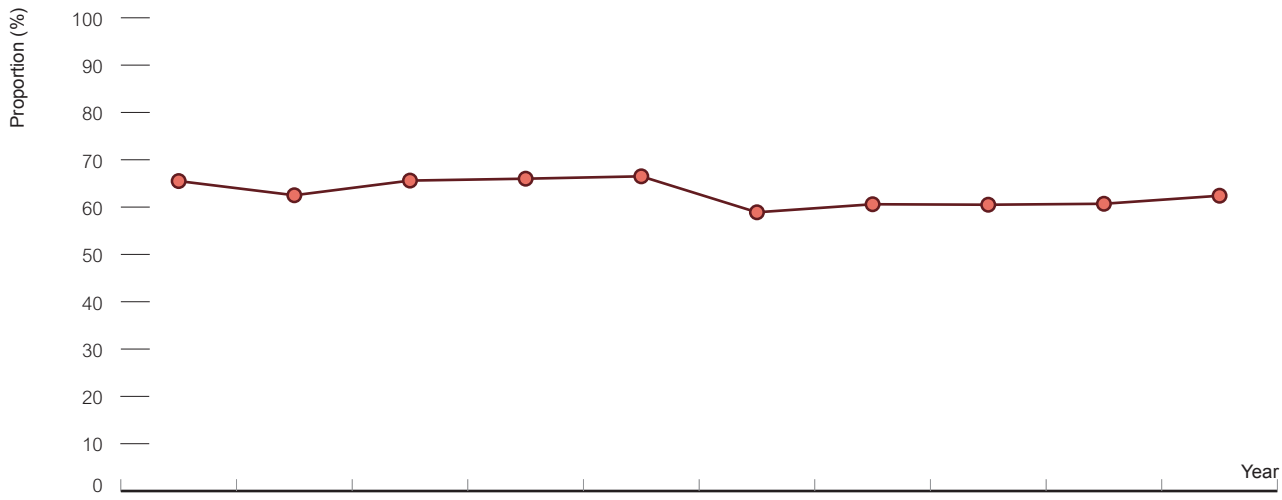
Numerator	Number of gay men who have been tested for HIV in the previous twelve months, reported in GCPS
Denominator	Number of gay men participating in GCPS

Background: The Australian HIV epidemic has predominantly been due to transmission through male-to-male sex. Of the 1 081 new HIV notifications in 2014, 75% reported an exposure category including male-to-male sex.[3] Increasing the proportion of men who test regularly and are aware of their HIV status is therefore of critical importance. As HIV is often asymptomatic, clinical guidelines recommend annual screening for sexually active gay men.

Data source and considerations: The GCPS are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). See Methodological Notes for further detail.

Results: Results from the GCPSs, indicate that in 2013 61% of non-HIV positive gay male participants report having an HIV test in the 12 months prior to the survey, compared to 62% in 2014.[50] This proportion has been relatively stable over the last ten years (Figure 34).

Figure 34 Proportion of non-HIV positive men tested for HIV in the 12 months prior to completing the survey, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Proportion	65.5%	62.5%	65.6%	66.0%	66.5%	58.9%	60.6%	60.5%	60.7%	62.4%

Source: GCPS

4.3b *Proportion of people who inject drugs who have been tested for HIV in the previous 12 months*

Indicator definition

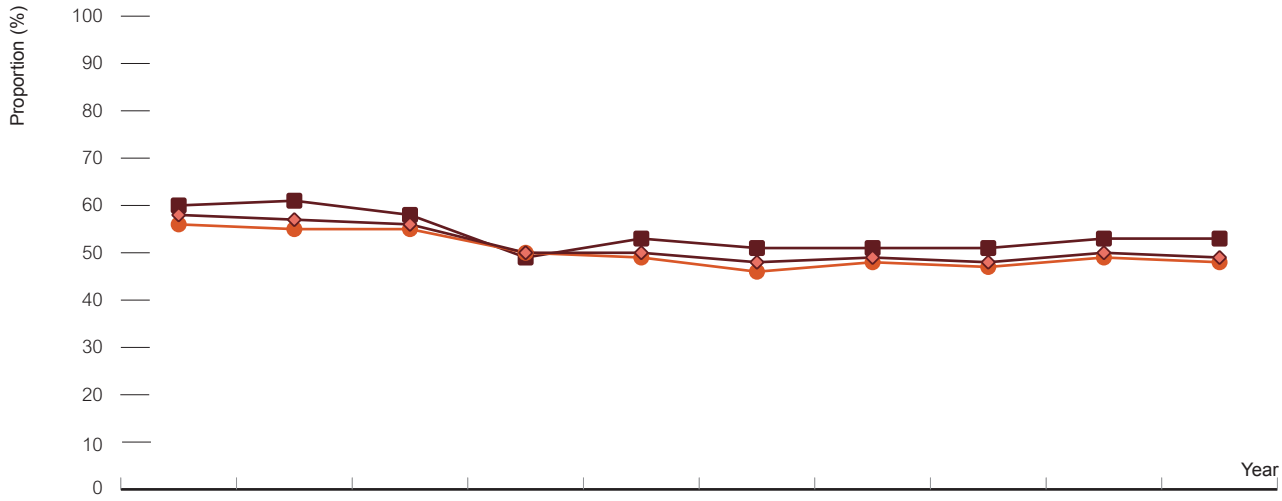
Numerator	Number of ANSPS participants who report having had an HIV test in the last 12 months
Denominator	Total number of participants in the ANSPS

Background: Preventing transmission of HIV through injecting drug use has been effectively underpinned by needle and syringe programs. Timely testing is a secondary prevention strategy and aims to increase case detection and enable people to commence treatment earlier.

Data source and considerations: Data regarding the number of people who inject drugs who have been tested for HIV in the previous year was collected by the annual ANSPS. See Methodological notes for further detail.

Results: Between 2013 and 2014, the proportion of all respondents reporting an HIV antibody test in the previous 12 months remained steady at around half. However, this proportion has declined from 58% in 2005, to 48% in 2010, and 49% in 2014 (Figure 35).

Figure 35 Proportion of people who inject drugs who attended needle and syringe programs and reported an HIV test in the past 12 months, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	58%	57%	56%	50%	50%	48%	49%	48%	50%	49%
Male	56%	55%	55%	50%	49%	46%	48%	47%	49%	48%
Female	60%	61%	58%	49%	53%	51%	51%	51%	53%	53%

Source: ANSPS

4.3c *Median CD4 counts at HIV diagnosis*

Indicator definition

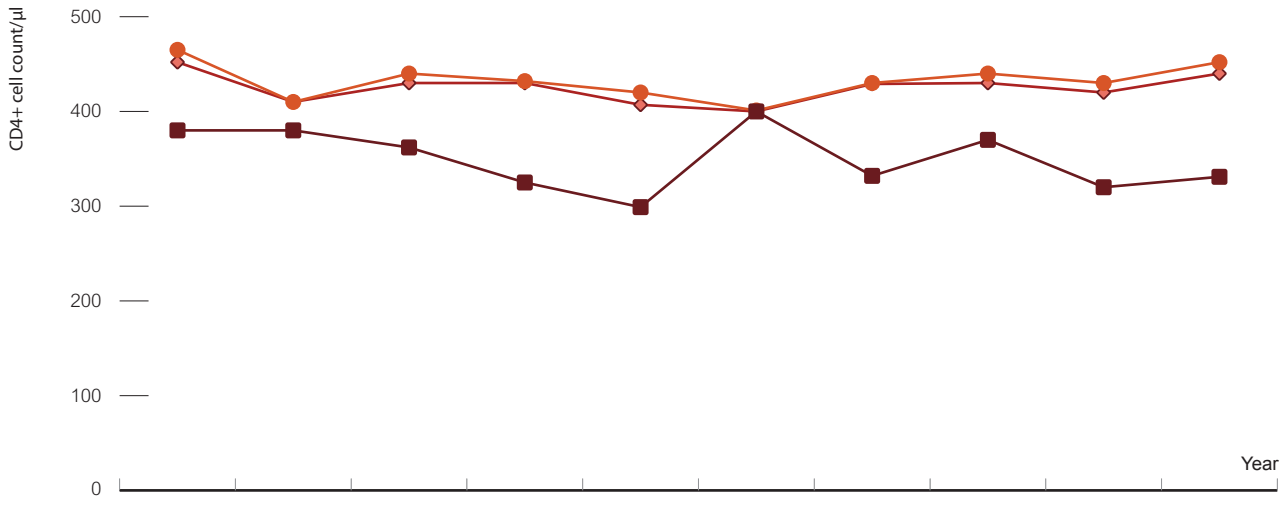
Single Measure	Median of the CD4 counts for all HIV diagnoses within the last 12 months

Importance: In people with HIV, CD4+ cell count/µl is the most important laboratory indicator of how well the immune system is working and the strongest predictor of HIV progression. The median CD4 cell count in healthy HIV-negative people is 952 cells/µL (range 771 – 1109 cells/µL) and the median time taken to develop AIDS without treatment is around 11 years after seroconversion.[51] The human immunodeficiency virus mainly infects the CD4 cells in the immune system. During primary HIV infection, the number of CD4 cells in the bloodstream decreases by 20% to 40% Progression of HIV infection impairs immune function and causes a median decline in CD4 cell count per year of 67 cells/µL (range 50 – 100 cells/µL).[52]

Data source and considerations: The CD4+ cell counts within 3 months of newly diagnosed cases of HIV are recorded in the National HIV Registry; see Methodological Notes for further detail. Changes in CD4 count over time should be interpreted with caution, as increases in testing during primary infection may lower the median CD4 count as for many people their CD4 count declines during HIV primary infection.

Results: In 2013, the median CD4+ cell count at diagnosis was 420 cells/µL, increasing relatively by 5% to 440 cells/µL in 2014, and in nearly all years higher in males than females (Figure 36).

Figure 36 Median CD4+ cell count for newly diagnosed HIV infections, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total*	452	410	430	430	407	400	429	430	420	440
Male	465	410	440	432	420	401	430	440	430	452
Female	380	380	362	325	299	400	332	370	320	331

* Total includes transgender

Source: State and Territory health authorities

4.3d *Proportion of high-risk men who have been tested none, one, two or three or more times in the previous 12 months (additional information)*

Indicator definition

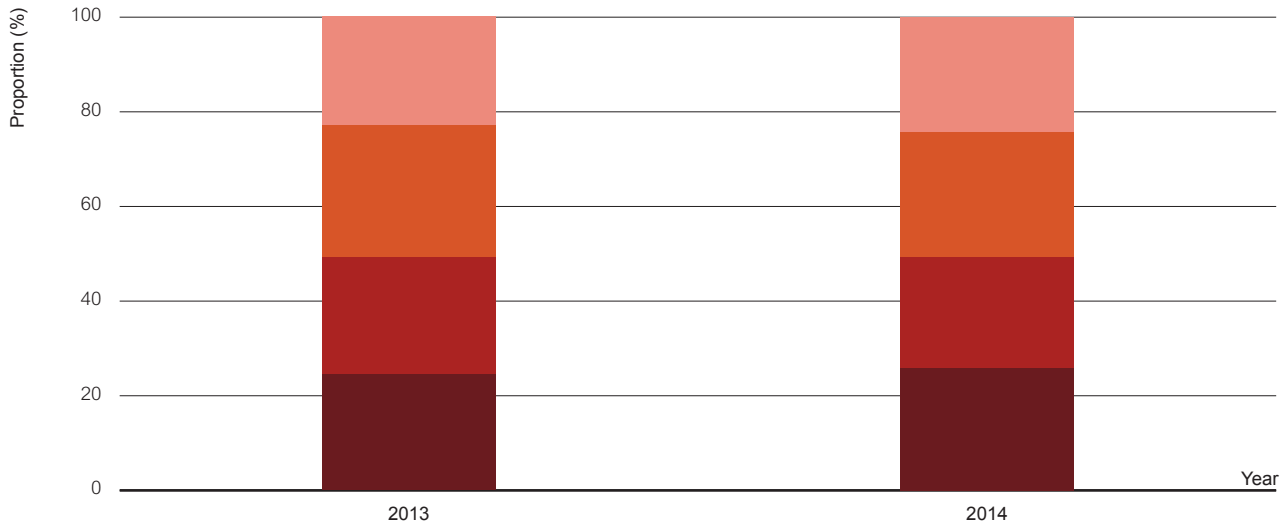
Numerator	Number of high-risk gay men who have been tested none, one, two or three or more times for HIV in the previous twelve months, reported in GCPS
Denominator	Number of gay men participating in GCPS

Importance: Clinical guidelines recommend 3 – 6 monthly HIV testing for men at higher-risk indicated by condomless sex, >10 partners in the last 6 months and other risk criteria. More frequent testing is important to detect infections earlier and enable people to start treatment earlier and thus reduce their viral load to undetectable levels, reducing the risk of further transmission. Earlier treatment also improves health outcomes for the individual.[53]

Data source and considerations: The GCPSs are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). See Methodological Notes for further detail. For this indicator, high-risk was defined as any condomless sex with a positive or unknown status regular partner (last 6 months), any condomless sex with casual partners (last 6 months), more than 10 male partners (last 6 months) and any STI diagnosis (last 12 months). Data on frequency of HIV tests in the previous 12 months are not available from years before 2013.

Results: The proportion of high-risk men receiving 3 or more HIV tests in the previous 12 months has remained stable between 2013 and 2014 at 23% and 24% respectively. At the same time, the proportion of men who have had no tests has remained stable at 25% in 2013 and 26% in 2014 (Figure 37).

Figure 37 Proportion of high-risk men reporting none, one, two or three or more HIV tests in the previous 12 months



	2013	2014
None	24.5%	25.8%
One	24.8%	23.4%
Two	27.9%	26.6%
Three or more	22.9%	24.3%

Note: Data only available from 2013
Source: GCPS

4.3e Proportion of people living with HIV who are undiagnosed (additional information)

Indicator definition

Numerator	Estimated number of people who have undiagnosed HIV infection in Australia
Denominator	Estimated number of people living with HIV in Australia

Background: HIV diagnosis is the essential first step in the HIV care continuum. Diagnosis allows an individual to receive care and treatment to reduce viral load, increase immune function, and thereby reduce risk for transmission, morbidity, and mortality.[54] Individuals who are aware of their infection can also make behavioural changes to reduce transmission.

Data source and considerations: HIV notifications data were provided from the National HIV Registry. The number of people living with undiagnosed HIV infection (PLDHIV) was estimated using annual notifications adjusted for duplicate notifications, estimated mortality rates, and overseas migration rates. See Methodological Notes for further detail.

Results: During 2014, an estimated 27 150 (24 630 – 30 310) people were living with HIV, and 3 350 were undiagnosed (2 100 – 4 670). This corresponds to 12% (range 8% – 17%) of all people living with HIV being undiagnosed with HIV infection (see Figure 39 for details of the HIV cascade). The proportion has remained stable, with an estimated 12% (3 201) living with undiagnosed HIV infection in 2013.

4.3f Proportion of new HIV diagnoses determined to be late (additional information)

Indicator definition

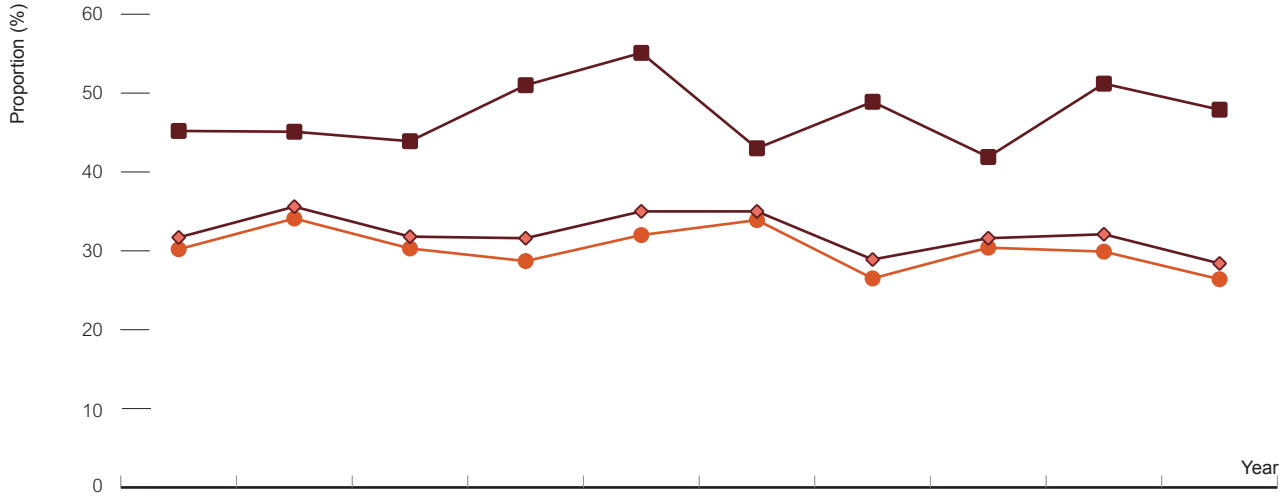
Numerator	Number of newly diagnosed HIV notifications classified as late per year
Denominator	Total number of newly diagnosed HIV notifications per year

Importance: There is a critical role for effective and timely HIV antibody testing for minimising ongoing HIV transmission, minimising the morbidity and mortality caused by HIV, minimising the personal and social impact of HIV infection, and for more accurate population level surveillance.[55] Late HIV diagnoses (defined as newly diagnosed HIV infection with a CD4+ cell count of less than 350 cells/μL) leads to late initiation of antiretroviral treatment for minimising the risk of progression of HIV disease and for minimising the risk of onwards HIV transmission. A CD4 count of <350 cells/μ/ indicates that a person has probably acquired their infection about 4 – 5 years earlier, but have not been tested.

Data source and considerations: Data on newly diagnosed notifications of HIV are from the National HIV Registry; see Methodological Notes for further detail. Late HIV diagnosis was defined as newly diagnosed HIV infection with a CD4+ cell count of less than 350 cells/μL. Notifications classified as newly acquired were excluded from late or advanced categorisation.

Results: In 2013, the proportion of newly diagnosed HIV notifications classified as late was 32%, and decreased by 4% to 28% in 2014 (Figure 38). The proportion of late diagnoses ranged from 28 to 36% between 2005 and 2014. In all years a higher proportion of female notifications were classified as late diagnoses, compared to male notifications.

Figure 38 Proportion of late diagnoses among newly diagnosed HIV notifications, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	31.7%	35.6%	31.8%	31.6%	35.0%	35.0%	28.9%	31.6%	32.1%	28.4%
Males	30.2%	34.1%	30.3%	28.7%	32.0%	33.9%	26.5%	30.4%	29.9%	26.4%
Females	45.2%	45.1%	43.9%	51.0%	55.1%	43.0%	48.9%	41.9%	51.2%	47.9%

Source: State and territory health authorities

4.4 Increase the proportion of people living with HIV on treatment with an undetectable viral load

4.4a Proportion of people living with diagnosed HIV who are receiving antiretroviral treatment

Indicator definition

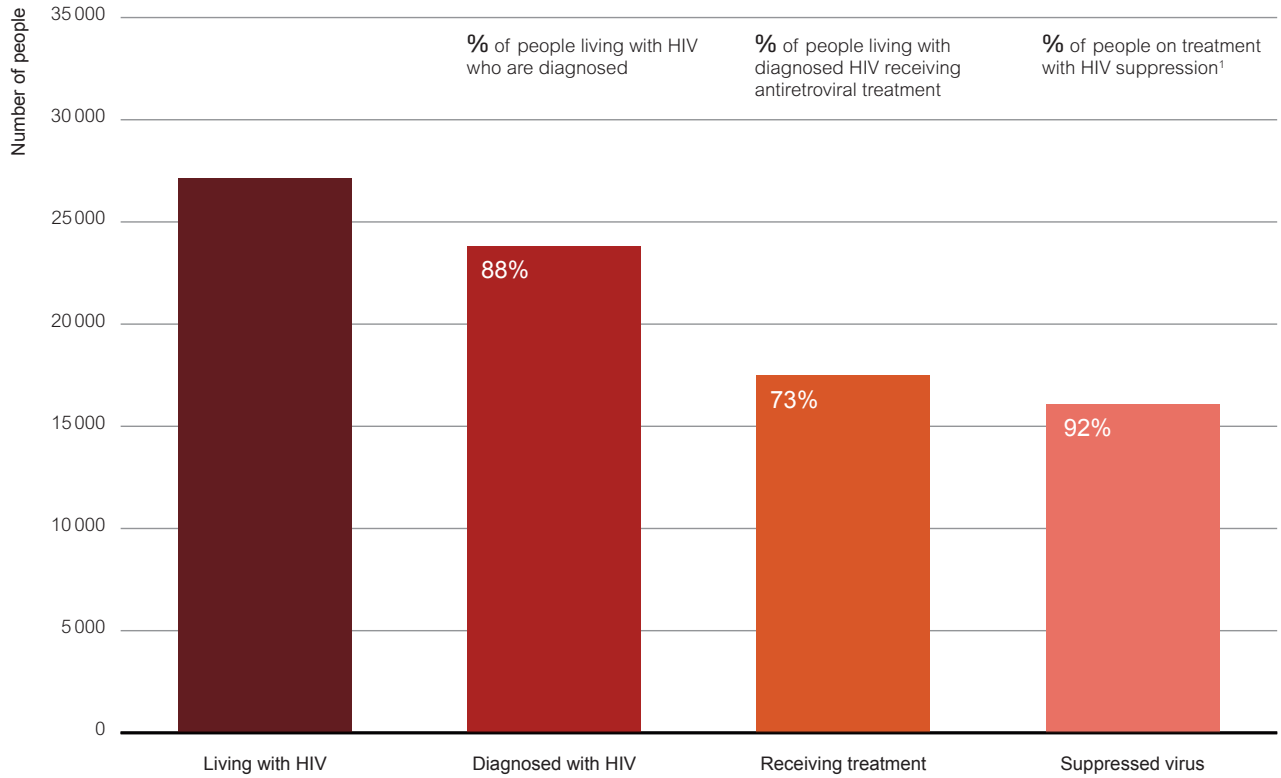
Numerator	Number of people with HIV prescribed antiretroviral treatment
Denominator	Model-based estimate of number of people living with HIV

Importance: There is strong evidence that effective antiretroviral therapy (ART) leads to the reduction of viral load to undetectable levels and virtually eliminates the risk of onward HIV transmission to sexual partners.[56 – 58] New evidence proving the personal health benefit of early HIV therapy were published in July 2015[59] and have led to changes in HIV treatment guidelines in Australian and internationally to recommend that HIV therapy be offered immediately on HIV diagnosis.

Data source and considerations: The number of people receiving ART was estimated using a 10% sample of the Pharmaceutical Benefits Scheme (PBS) patient level script claims data provided by the company Prospection. See Methodological Notes for further detail.

Results: During 2014, an estimated 27 150 (24 630 – 30 310) people were living with HIV and 17 470 (16 600 – 18 340) were on antiretroviral therapy, this corresponds to 73% (range 69 – 77) of all people living with diagnosed HIV (Figure 39) on antiretroviral therapy. This is an increase of 2% since 2013, when an estimated 71% of all people living with diagnosed HIV were on antiretroviral therapy.

Figure 39 The 2014 HIV diagnosis and care cascade



Estimate	27150	23800	17470	16090

1 Viral suppression classified as <400 copies/mL

Source: See Methodological Notes for detail

4.4b *Proportion of people receiving antiretroviral treatment for HIV infection whose viral load is less than 50 copies/mL*

Indicator definition

Numerator	Number of people receiving antiretroviral treatment for HIV whose viral load is less than 50 copies/mL reported in the AHOD
Denominator	Number of people receiving antiretroviral treatment for HIV reported in the AHOD

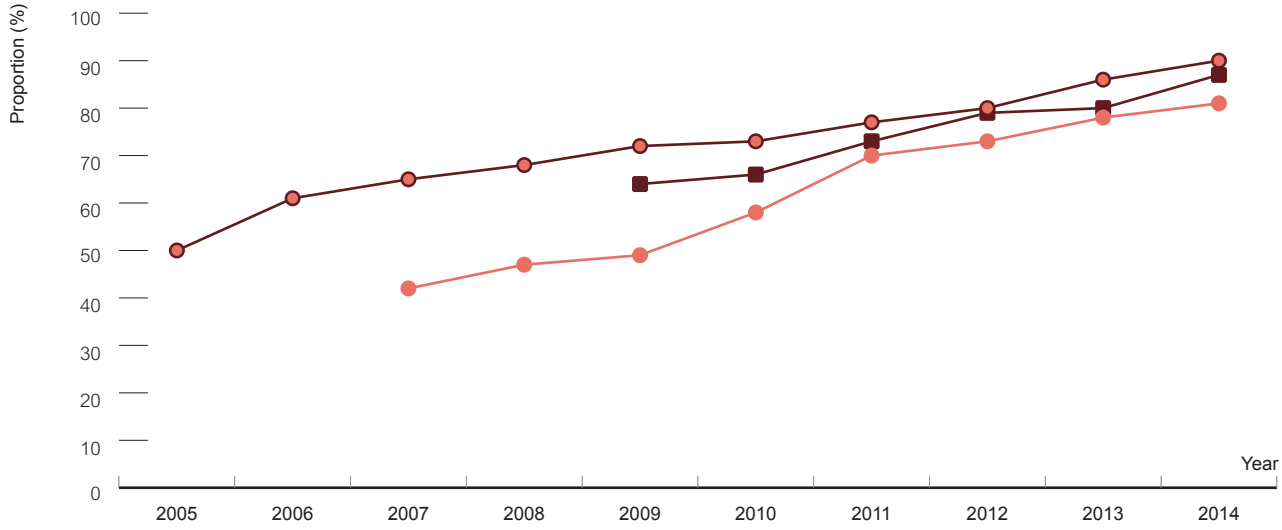
Importance: HIV viral load represents the amount of HIV virus in a person's blood, once a person is on antiretroviral treatment and has a stable undetectable HIV viral load then there is a very low risk of HIV transmission during risk exposures. A number of research trials have found no transmissions from a partner with undetectable viral load.[60, 61] In the HPTN 052 trial of early HIV treatment, a small number of HIV transmissions likely occurred before or soon after the index partner started antiretroviral treatment and after the index failed early HIV treatment.[62]

Data source and considerations: The proportion of people on ART with viral load less than 50 copies/ml was sourced from the Australian HIV Observational Database (AHOD). Additional data are available from 44 sexual health clinics and 4 primary care clinics in Victoria and New South Wales with a high case load of gay and bisexual men participating in the ACCESS project. See Methodological Notes for further detail.

Results: As treatment coverage has increased in Australia, there has been a corresponding increase in the proportion of people with undetectable viral load (<50 copies/ml). The AHOD data shows that the proportion of people with undetectable viral load was 86% in 2013 and increased by 4% to 90% in 2014. There was a greater increase over ten years, from 50% in 2005 (Figure 40). Data from ACCESS sexual health clinics showed a 3% increase in the proportion of people with undetectable viral load from 78% in 2013 to 81% in 2014, with a greater increase over eight years from 42% in 2007 to 81% in 2014. In high case load (HCL) general practice clinics undetectable viral load has increased by 7% from 80% in 2013 to 87% in 2014 with a greater increase seen over a longer time period with 64% in 2009 to 87% in 2014.

HIV

Figure 40 Proportion of people with HIV receiving antiretroviral treatment whose viral load is less than 50 copies/mL and (i) participate in the Australian HIV Observational Database, and (ii) attended sexual health and general practice clinics participating in ACCESS



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AHOD	50%	61%	65%	68%	72%	73%	77%	80%	86%	90%
Sexual health clinics			42%	47%	49%	58%	70%	73%	78%	81%
General practice HCL					64%	66%	73%	79%	80%	87%

Source: AHOD; ACCESS

4.5 Improve the quality of life of people living with HIV

4.5 Proportion of people with HIV who report their general health status and their general well-being to be excellent or good

Indicator definition

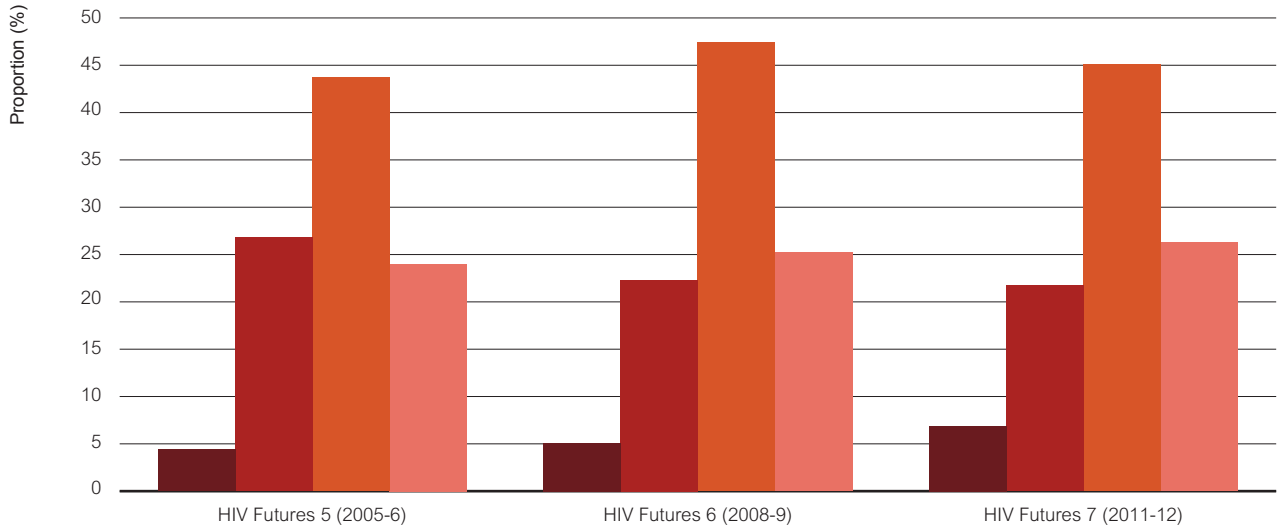
Numerator	Number of people with HIV who report their general health status and their general well-being to be excellent or good in the HIV Futures Study
Denominator	Number of people with HIV who participate in the HIV Futures study

Importance: With the recent advances in treatments for those suffering from HIV, the survival of these patients has been increased and their quality of life and general well-being has emerged as an important focus for researchers and healthcare providers.[63] The term 'quality of life' is used to convey an overall sense of well-being and includes aspects such as happiness and satisfaction with life as a whole.[64] Given that HIV patients struggle with numerous social problems such as stigma, depression, substance abuse, and cultural beliefs which can affect not only their physical well-being but also their mental and social health, it is important to provide a broad indication of the morbidity and the social impact of HIV infection.[64]

Data source and considerations: Currently, the Futures study is the only regular cross-sectional study of the experiences of people living with HIV nationally. The HIV Futures Study is conducted every 2-3 years and is a national cross-sectional survey of people living with HIV. HIV Futures 7, the latest of these anonymous self-administered surveys to be completed, sampled 1 058 people living with HIV infection in Australia.[65] The most recent survey was carried out over 6 months from October 2011 to March 2012. See Methodological Notes for further detail.

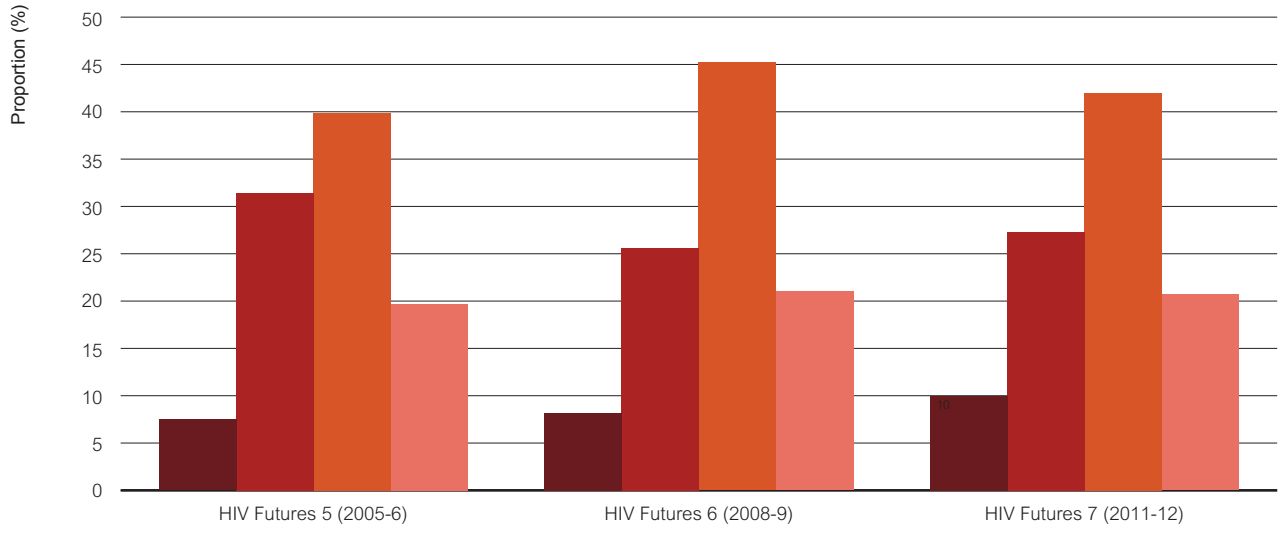
Results: Among people living with HIV infection who participated in HIV Futures 7 survey, 71.4% of respondents reported their health as 'good' or 'excellent' (Figure 41). Self-rating of wellbeing was reported as 'good' or 'excellent' by 63% of respondents in HIV Futures 7 survey (Figure 42). These proportions were similar to those reported in HIV Futures 5 and 6.

Figure 41 Participants' self-ratings of general health status in the HIV Future 5, 6 and 7 studies



	HIV Futures 5 (2005-6)	HIV Futures 6 (2008-9)	HIV Futures 7 (2011-12)
Poor	4.4%	5.1%	6.9%
Fair	26.8%	22.3%	21.7%
Good	43.7%	47.4%	45.1%
Excellent	24.0%	25.2%	26.3%

Figure 42 Participants' self-ratings of overall wellbeing in the HIV Future 5, 6 and 7 studies



	HIV Futures 5 (2005-6)	HIV Futures 6 (2008-9)	HIV Futures 7 (2011-12)
Poor	7.5%	8.2%	10.0%
Fair	31.4%	25.6%	27.3%
Good	39.9%	45.2%	42.0%
Excellent	19.7%	21.0%	20.7%

Source: Futures Study

4.6 Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health

Indicator being developed (see Section 1.6 for further information)

5. Aboriginal and Torres Strait Islander

Epidemiology overview

Hepatitis B:

There were a total of 164 Aboriginal and Torres Strait Islander notifications of newly diagnosed hepatitis B infection in Australia in 2014. Newly diagnosed hepatitis B includes newly acquired and unspecified infections (see Hepatitis B section). Information on Aboriginal and Torres Strait Islander status was reported for more than 50% of notifications of newly acquired hepatitis B infection in all jurisdictions. In 2014, the notification rate of newly diagnosed hepatitis B infection for the Aboriginal and Torres Strait Islander population was 2 times higher than the non-Indigenous population (50 per 100 000 population versus 23 per 100 000 population). However, in the period 2010 – 2014, there was a 44% decline in the notification rate of newly diagnosed hepatitis B infection in the Aboriginal and Torres Strait Islander population (from 90 per 100 000 population in 2010) suggesting the immunisation programs for hepatitis B are starting to have a benefit.

Hepatitis C:

A total of 877 Aboriginal and Torres Strait Islander cases of newly diagnosed hepatitis C infection were reported in Australia in 2014. Information on Aboriginal and Torres Strait Islander status was reported for more than 50% of notifications of newly acquired hepatitis C infection in all jurisdictions except Queensland where all hepatitis C cases were notified as unspecified. The notification rate of newly diagnosed hepatitis C infection in the Aboriginal and Torres Strait Islander population was 164 per 100 000 population, almost 5 times higher than the 35 per 100 000 population in the non-Indigenous population. In the last five years, there was a 38% increase in the notification rate of newly diagnosed hepatitis C infection in the Aboriginal and Torres Strait Islander population (from 119 in 2010).

HIV:

A total of 33 Aboriginal and Torres Strait Islander notifications of newly diagnosed HIV were reported in 2014. Between 2012 – 2014, the notification rate of newly diagnosed HIV infection was higher for the Aboriginal and Torres Strait Islander population compared to the Australian-born non-Indigenous population (5.9 vs. 3.7 per 100 000 population in 2014). All jurisdictions have high completeness rates for Aboriginal and Torres Strait Islander status in HIV notifications and thus data from all jurisdictions are included. In the five-year period 2010 – 2014, a higher proportion of notifications of newly diagnosed HIV infection among the Aboriginal and Torres Strait Islander population compared with the non-Indigenous Australian-born population were attributed to injecting drug use (16% vs. 3%) or heterosexual sex (20% vs. 13%) and a higher proportion was seen among females (22% vs. 5%).

Chlamydia:

There was a total of 86 136 notifications of chlamydia in 2014, 6 641 (8%) were among the Aboriginal and Torres Strait Islander population, 25 365 (29%) were among the non-Indigenous population and Indigenous status was not reported for 54 130 (63%) notifications. In the period 2010 – 2014, Aboriginal and Torres Strait Islander status was not reported for more than 50% of notifications each year in the Australian Capital Territory, New South Wales, Tasmania and Victoria and as such notification data for chlamydia excludes these jurisdictions. The chlamydia notification rate for the Aboriginal and Torres Strait Islander population of 1 341 per 100 000 population in 2014 was 3 times that of the non-Indigenous notification rate at 389 per 100 000 population. In 2014, 80% of chlamydia notifications among the Aboriginal and Torres Strait islander population, and 78% among the non-Indigenous population were in 15 – 29 year olds.

Gonorrhoea:

There were a total of 15 786 notifications of gonorrhoea in Australia in 2014; 3 584 (23%) were among the Aboriginal and Torres Strait Islander population, 6 915 (44%) among the non-Indigenous population, and Indigenous status was not reported for 5 287 (33%) diagnoses. In the period 2010 – 2014, Aboriginal and Torres Strait Islander status was reported for less than 50% of notifications per year in New South Wales and Queensland, and as such, notification data for gonorrhoea excludes these jurisdictions. In 2014, the gonorrhoea notification rate in the Aboriginal and Torres Strait Islander population was 18 times that of the non-Indigenous population (859 vs. 49 per 100 000 population). In 2014, 71% of cases among the Aboriginal and Torres Strait Islander population were diagnosed among people in the age group 15 – 29 years compared with 56% in the non-Indigenous population. In Aboriginal and Torres Strait Islander peoples, the notification rate of gonorrhoea diagnosis among males and females is roughly equal, indicating predominantly heterosexual transmission.

Infectious syphilis:

There were a total of 1 999 infectious syphilis notifications nationally in 2014, with 235 (12%) among the Aboriginal and Torres Strait Islander population, 1 588 (79%) among the non-Indigenous population and a further 176 (9%) cases for which Indigenous status was not reported. Accurate and complete systems for the notification of infectious syphilis exist nationally, enabling greater than 91% of all infectious syphilis diagnoses to be notified by Aboriginal and Torres Strait Islander status. In 2014, the infectious syphilis notification rate in the Aboriginal and Torres Strait Islander population was 4 times higher than the non-Indigenous population (32 vs. 8 per 100 000 population) increasing to 300 times higher in remote areas. Notification rates of infectious syphilis among the Aboriginal and Torres Strait Islander population increased in 15 – 19 year olds in 2011 (from 34 per 100 000 population in 2010 to 95 per 100 000 population in 2011), due to an outbreak in the northern areas of Queensland, the Northern Territory and Western Australia, and was 99 per 100 000 population in 2014. In Aboriginal and Torres Strait Islander peoples, the notification rate among males and females is roughly equally, indicating predominantly heterosexual transmission. Notifications of congenital syphilis in Aboriginal and Torres Strait Islander peoples declined from 7 in 2005 to 1 in 2009, and then returned to 5 in 2014. The resurgence of infection in remote communities after years of declining notification rates, bringing with it cases of congenital syphilis, emphasises the need for testing and treatment in this population, particularly in antenatal settings.

Donovanosis:

Since 2007 there have been fewer than 3 notifications of donovanosis per year nationally, with zero in 2011, 1 in 2012, zero in 2013 and 1 in 2014. The National Donovanosis Eradication (Elimination) Project was implemented from 2001 – 2004, following the introduction of improved methods of diagnosis and treatment of donovanosis. There were no notifications of donovanosis in New South Wales, South Australia, Tasmania, Victoria and the Northern Territory in the past 5 years, and no notifications in Queensland in the past 4 years. In Western Australia there were no notifications between 2006 – 2011, with 1 non-Indigenous notification in 2012, none in 2013 and 1 Aboriginal and Torres Strait Islander notification in 2014

Note: Notification rates per 100 000 population only include states/territories with >50% completeness of Aboriginal and Torres Strait Islander status

Indicator status

Knowledge

- In a 2011 – 2013 national survey (GOANNA) 82% of participants correctly identified that STIs can be symptomless in males, and 81% that STIs can be symptomless in females. A lower proportion (60%) correctly identified that chlamydia can cause infertility in women.
- Broadly, females had higher levels of STI knowledge than males (median score 10 versus 9 respectively) and just over a third (35%) of respondents correctly answered 11 or more of the 12 questions.

Incidence and prevalence

- In 2013, chlamydia positivity among 15 – 29 year old Aboriginal and Torres Strait Islander people attending sexual health clinics was 18%, increasing to 20% in 2014, with a similar proportion reported in 2007.
- The notification rate is used here as a surrogate for incidence (see section 5.2 for data considerations).
- In 2013, the chlamydia notification rate for the Aboriginal and Torres Strait Islander population was 1 374.7 per 100 000 population, similar to the 1 341.2 per 100 000 population in 2014. There has been very little change to the rate of notification in the last five years, at 1 342.4 per 100 000 population in 2010.
- In 2013, the gonorrhoea notification rate in the Aboriginal and Torres Strait Islander population was 968.4 per 100 000 population, compared to 858.5 per 100 000 population in 2014, representing an 11% relative decrease. Rates of notification have been relatively stable in the five year period 2010 – 2014, from 886.9 per 100 000 population in 2010.
- In 2013, the rate of infectious syphilis notification among the Aboriginal and Torres Strait Islander population was 20.6 per 100 000 population, compared to 32.0 per 100 000 population in 2014, representing a 52% relative increase. Infectious syphilis notification rates have increased by 46% over the last five years, from 21.9 per 100 000 population in 2010.
- In 2013 the newly acquired hepatitis B notification rate in the Aboriginal and Torres Strait Islander population was 1.9 per 100 000 population, with a 26% relative increase to 2.4 per 100 000 population in 2014. Over the five-year period 2010 – 2014, the notification rate has decreased by 38%, from 3.9 to 2.4 per 100 000 population respectively.
- In 2013 the notification rate of newly acquired hepatitis C infection among the Aboriginal and Torres Strait Islander population was 10.2 per 100 000 population, with a relative 61% increase to 16.4 per 100 000 population in 2014. The increase was even greater over the five-year period 2010 – 2014, with a 166% relative increase from 6 per 100 000 population in 2013.
- In 2013 the rate of Aboriginal and Torres Strait Islander HIV notifications was 4.9 per 100 000 population, with a 20% relative increase in the rate to 5.9 per 100 000 population in 2014. In the ten-year period 2005 – 2014 there was a 64% relative increase in the HIV notification rate, from 3.6 per 100 000 population in 2005.

Uptake of preventative measures

- In 2013, coverage of hepatitis B vaccination at 12 months was 87%, similar to the 88% in 2014, and coverage at 24 months was stable, at 95-96%.
- Receptive syringe sharing was similar in 2013 and 2014, at 21% and 22%, respectively, but higher than observed for non-Indigenous people (15 – 16%).

Testing

- The GOANNA survey found that 49% of participants had been tested for an STI in the previous 12 months.

Morbidity

- The number of cases of congenital syphilis notified as Aboriginal and Torres Strait Islander was 3 in 2013 and 5 in 2014, equating to a notification rate of 28.1 per 100 000 live births in 2014 (compared to 2 per 100 000 in the non-Indigenous population).

Indicator status (cont.)

Summary: The first year of the 4th National Aboriginal and Torres Strait Islander Blood-borne Viruses and Sexually Transmissible Infections Strategy highlights the need for improved coverage of vaccination, health promotion, testing, treatment and other prevention tools in this population. The gap in hepatitis B vaccine coverage between 12 and 24 months suggests issues around timeliness of completion of the course of vaccines. Overall, notifications rates for all STIs (including congenital syphilis) and BBVs in Aboriginal and Torres Strait Islander people were higher than the overall Australian rates and between 2013 and 2014, there were increases in notification rates of infectious syphilis, newly acquired hepatitis C and HIV. Only the notification rates of chlamydia and gonorrhoea have seen small declines since 2013. Data on treatment uptake for HIV, hepatitis B and C among Aboriginal and Torres Strait Islander people were not available at the time of report preparation, but activities are planned to provide this information for future reports. Given the small number of Aboriginal and Torres Strait Islander notifications for a number of infections, particularly newly acquired hepatitis B and C, and HIV, changes from one year to the next should be interpreted with caution. Detailed comparisons between non-Indigenous and Aboriginal and Torres Strait Islander populations are provided in the Bloodborne viral and sexually transmissible infections in Aboriginal and Torres Strait Islander people: Annual Surveillance Report 2015. Completeness of Aboriginal and Torres Strait Islander status is an ongoing issue, with reporting only including states and territories with greater than 50% completeness. In 2014, all jurisdictions reported Aboriginal and Torres Strait Islander status for greater than 50% of notifications for HIV, infectious syphilis and newly acquired hepatitis B. In 2013 the rate of Aboriginal and Torres Strait Islander HIV notifications was 4.9 per 100 000 population, with a 20% relative increase in the rate to 5.9 per 100 000 population in 2014. In the ten-year period 2005 – 2014 there was a 64% relative increase in the HIV notification rate, from 3.6 per 100 000 population in 2005.

Objectives and indicators

The National Aboriginal and Torres Strait Islander Strategy 2014 – 2017 identified five specific objectives, with associated indicators. Progress against these objectives and indicators is outlined in Table 7. Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence. Some *'additional information'* has been included due to data sources becoming available after the Plan was agreed and is marked accordingly.

Main Findings

Table 7 National Aboriginal and Torres Strait Islander Strategy progress

Theme	Objective		Indicator		2013	2014
Knowledge	5.1	Improve the knowledge and awareness of STI and BBV >	5.1	Proportion of Aboriginal and Torres Strait Islander people giving the correct answer to knowledge and behaviour questions on BBV and STI >	35%**	*[i]
Incidence and prevalence	5.2	Reduce the incidence of STI in Aboriginal and Torres Strait Islander people and communities >	5.2a	Proportion of chlamydia tests that yield a positive result in 15 – 29 year age group >	18%	20%
			5.2b	Annual rate of notifications of infectious syphilis in Aboriginal and Torres Strait Islander people (per 100,000 Aboriginal population) >	20.6	32.0[§]
			5.2b	Annual rate of notifications of chlamydia[ii] in Aboriginal and Torres Strait Islander people (per 100,000 Aboriginal population) >	1 374.7	1 341.2[§]
			5.2b	Annual rate of notifications of gonorrhoea[iii] in Aboriginal and Torres Strait Islander people per 100,000 Aboriginal population) >	968.4	858.5[§]
			5.2c	Number of notifications of congenital syphilis annually >	3	5
			5.2c	*Additional information:* Annual rate of notifications of congenital syphilis in Aboriginal people (per 100,000 live births) >	16.3	28.1
Update of preventative measures	5.2.1	Achieve high levels of HPV vaccination >	5.2.1	HPV three-dose vaccination coverage for Aboriginal and Torres Strait Islander males and females turning 15 years of age >	*	*[iv]
	5.2.2	Reduce the risk behaviours associated with transmission >	No indicator available		*	*
Testing	5.2.3	Increase appropriate testing and follow-up among those at elevated risk >	5.2.3	Proportion of Aboriginal 15 – 29 year olds receiving chlamydia testing in the previous 12 months: >		*[i]
				16 – 19 years	29%	
				20 – 24 years	51%	
				25 – 29 years	52%	
Incidence and prevalence	5.3	Reduce the incidence of BBV in Aboriginal and Torres Strait people and communities >	5.3a	Annual rate of notification of newly acquired hepatitis B in Aboriginal and Torres Strait Islander people (per 100,000 Aboriginal population) >	1.9	2.4[§]
			5.3b	Annual rate of notification of newly acquired hepatitis C[v] in Aboriginal and Torres Strait Islander people (per 100,000 Aboriginal population) >	10.2	16.4[§]
			5.3c	Notification rate of newly diagnosed HIV (per 100,000 Aboriginal and Torres Strait Islander population) >	4.9	5.9[§]

Theme	Objective		Indicator	2013	2014
Preventative measures	5.3.1	Achieve high levels of hepatitis B vaccination >	5.3.1a Hepatitis B immunisation in Aboriginal and Torres Strait Islander children >		
			12 months	86%	88%
			24 months	95%	96%
	5.3.2	Reduce the risk behaviours associated with transmission >	5.3.2a Proportion of Aboriginal and Torres Strait Islander people who inject drugs reporting re-using another person's used needle and syringe in the previous month >	21%	22%
			5.3.2b Proportion of Aboriginal and Torres Strait Islander people who are notified as newly diagnosed with HIV who report injecting drug use >	23%	27%
	5.3.3	Decrease the number of Aboriginal people with undiagnosed BBV >		*	20% undiagnosed HIV
	5.4	Increase the number of Aboriginal and Torres Strait Islander people with BBV receiving appropriate management, care and support for BBV >	Indicator unavailable[vi]	*	*
	5.5.1	Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health >	Stigma indicator unavailable[vii]	*	*
	5.5.2	Actively engage community >	Indicator unavailable	*	*
	5.5.3	Improve delivery of appropriate services	Indicator unavailable	*	*

Notification rates are given out of 100,000 population and to 1 decimal place

Percentages (%) are rounded to the nearest whole number

* data not available

** 2011 – 2012 survey data

§ In the absence of appropriate data for incidence, notifications data have been used, and should be interpreted with caution as a range of factors influence notifications

i There is currently no regular periodic survey of young Aboriginal and Torres Strait Islander people

ii Includes the Northern Territory, Queensland, South Australia, and Western Australia

iii Includes the Northern Territory, South Australia, Tasmania, Victoria, the Australian Capital Territory and Western Australia

iv Poor completeness of Indigenous status in the National Human Papillomavirus Register restricts reporting against this indicator

v Includes all jurisdictions except Queensland

vi Work is being done to develop a cascade of care for HIV, hepatitis C and chlamydia for the Aboriginal and Torres Strait Islander population

vii Among people who inject drugs and men who have sex with men and people living with HIV and hepatitis C (which may include Aboriginal and Torres Strait Islander people)

5.1 Improve knowledge and awareness of STI and BBV

5.1 Proportion of Aboriginal and Torres Strait Islander people giving correct answers to knowledge and behaviour questions on BBV and STI.

Indicator definition

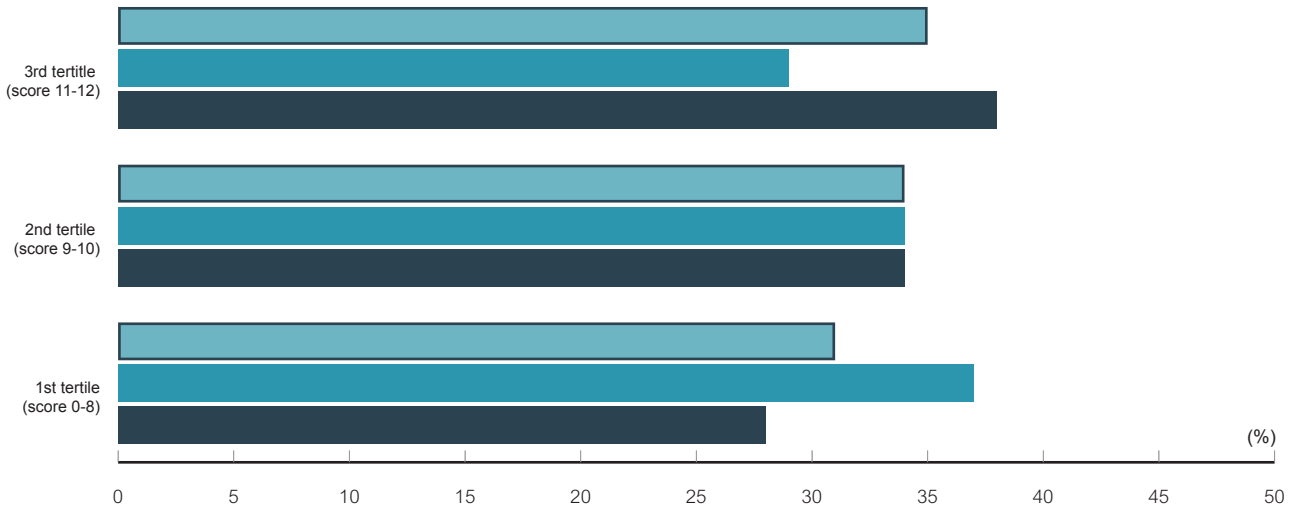
Numerator	Number of Aboriginal and Torres Islander people giving correct answers to questions on BBV and STI in the 'Sexual health and relationships in young Indigenous people study' (GOANNA)
Denominator	Number of Aboriginal and Torres Islander people in the GOANNA study

Background: Improved knowledge about STIs and BBVs in the Aboriginal and Torres Strait Islander community can play an important role in encouraging safer sexual behaviours and seeking regular testing and treatment, therefore reducing the transmission of these infections.

Data source and considerations: The 'Sexual Health and Relationships in young Indigenous people study' (GOANNA) the first national survey of young Aboriginal and Torres Strait Islander people in relation to STIs and BBVs undertaken in Australia was conducted during 2011 – 2013, see Methodological Notes for further detail. While studies of this nature can never claim to be truly representative of the total study population – in this case the total Aboriginal and Torres Strait Islander population aged 16–29 years – the respondent population includes a range of demographic characteristics, such as the ages within the study group aged 16–29 years, representation from urban, regional and remote areas and both heterosexual and homosexual identities similar to the broader population. The GOANNA study findings are currently the only source of data to measure this indicator. Participants' knowledge about the ways in which STIs and BBVs can be transmitted and treated was assessed using 12 questions.

Results: The majority of participants correctly answered that STIs could be symptomless in males (82%) and females (81%). A lower proportion (60%) correctly answered that chlamydia could cause infertility in women. Participants' knowledge is presented in tertiles of the total score by gender (Figure 43). Approximately, one third of the participants (35%) responded correctly to at least 11 questions; females scored higher than males (median knowledge score: 10 vs. 9 respectively).

Figure 43 Proportion of young indigenous people surveyed about sexual health knowledge with 0 – 8, 9 – 10, 11 – 12 correct answers, by sex



	1st tertile (score 0-8)	2nd tertile (score 9-10)	3rd tertitle (score 11-12)
Total	31%	34%	35%
Males	37%	34%	29%
Females	28%	34%	38%

Source: GOANNA survey

5.2 Reduce the incidence of STI in Aboriginal and Torres Strait Islander people and communities

5.2a Proportion of chlamydia tests that yield a positive result in 15 – 29 year age group

Indicator definition

Numerator	Number of positive chlamydia test results in 15 – 29 year old Aboriginal and Torres Strait Islander people
Denominator	Number of chlamydia tests conducted in 15 – 29 year old Aboriginal and Torres Strait Islander people

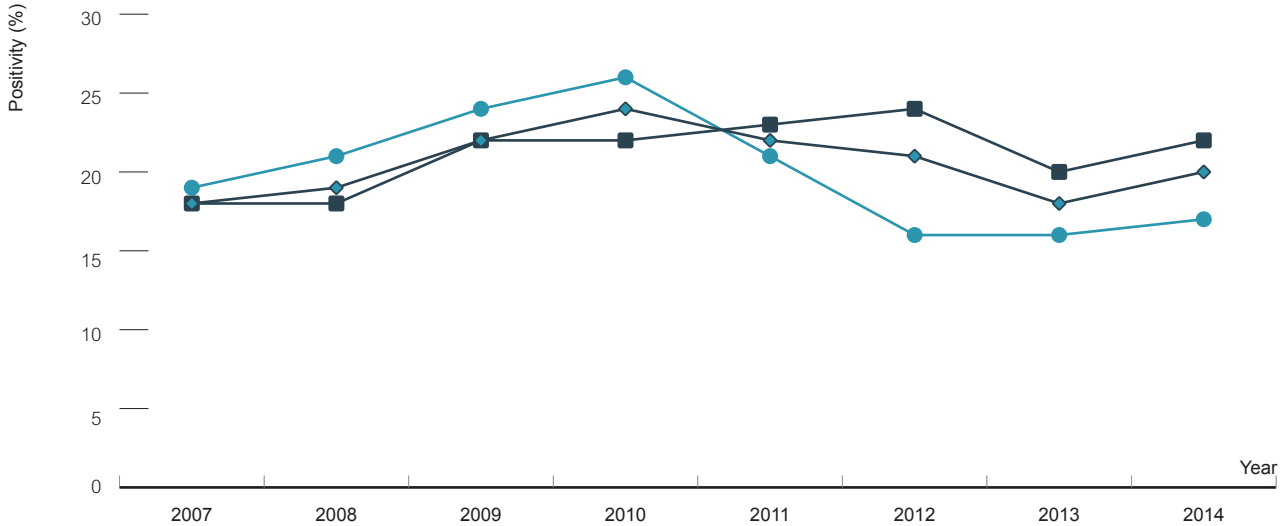
Background: Achieving a high level of testing and treatment of bacterial STIs in sexually active 15 – 29 year olds is an important component of reducing the risk of transmission and morbidity (such as pelvic inflammatory disease) and if high enough levels are achieved in the community, mathematical modelling predicts a decrease in the prevalence of these infections among young Aboriginal and Torres Strait Islander people. In the short-term, successful testing and treatment strategies will increase the notifications of bacterial STIs, however, a reduction will be observed in the long term.[66]

Data source and considerations: Similar mechanisms to measure this indicator as described under objective 3.2 of the STI Strategy, cannot be applied to the Aboriginal and Torres Strait Islander population due to poor completeness of the Voluntary Indigenous Identifier (VII) field collected through Medicare registration forms. VII, introduced in 2002, covers approximately 50% of the Aboriginal and Torres Strait Islander population and is likely to take a number of years before the data are sufficient to use for this purpose.[67]

In the interim, sentinel surveillance within healthcare settings with higher attendance of Aboriginal and Torres Strait Islander people, such as Aboriginal Community Controlled Health Services (ACCHS), Aboriginal Medical Services (AMS) and sexual health clinics, may be a suitable option to measure chlamydia testing uptake and positivity rate. The data presented below comes from the ACCESS network of sexual health clinics. See Methodological Notes for further detail.

Results: Data available from the ACCESS project report chlamydia positivity in 12 538 Aboriginal and Torres Strait Islander 15 – 29 year olds attending sexual health clinics between 2007 and 2014 (Figure 44). Positivity was 18% in 2013, with a 2% increase to 20% in 2014. Results show a peak of positivity in 2010 of 24%, decreasing to 18% in 2013. Positivity in 2014 was higher among females (22%) than males (17%), with increases in both sexes between 2013 and 2014 (Figure 44).

Figure 44 Chlamydia positivity in Aboriginal and Torres Strait Islander 15 – 29 year olds attending sexual health clinics, 2007 – 2014, by sex



	2007	2008	2009	2010	2011	2012	2013	2014
Total	18%	19%	22%	24%	22%	21%	18%	20%
Males	19%	21%	24%	26%	21%	16%	16%	17%
Females	18%	18%	22%	22%	23%	24%	20%	22%

Source: ACCESS

5.2b *Annual rate of notifications of infectious syphilis, chlamydia and gonorrhoea*

Indicator definition

Numerator	Number of infectious syphilis (defined as infection of less than 2 years duration), chlamydia and gonorrhoea notifications reported as Aboriginal and Torres Strait Islander people to NNDSS
Denominator	Aboriginal and Torres Strait Islander population reported by Australian Bureau of Statistics (ABS)

Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence.

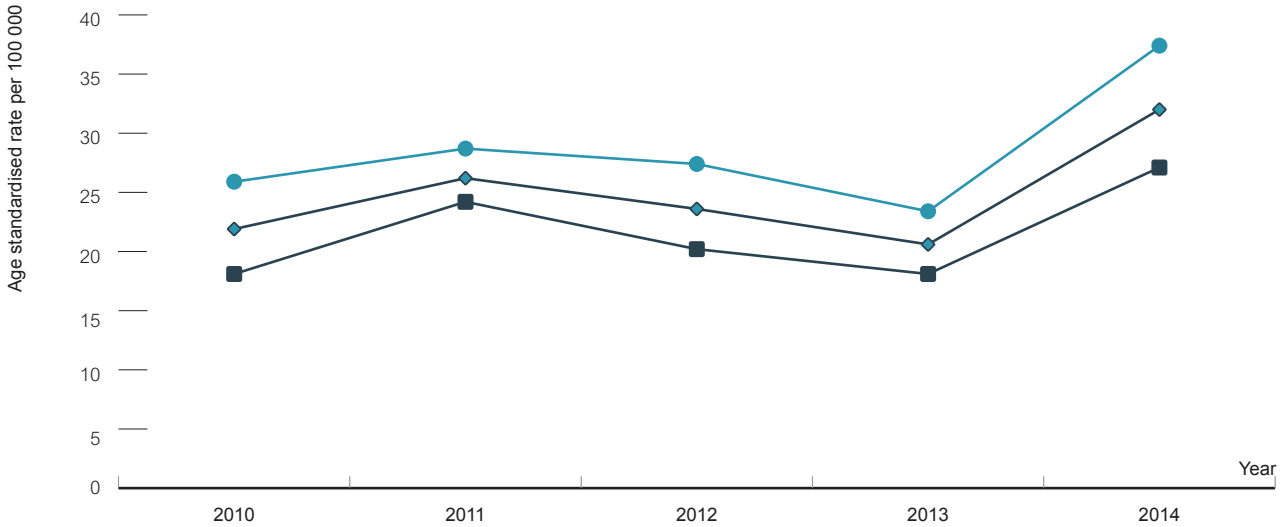
Infectious syphilis

Background: Infectious syphilis is highly transmissible and untreated can lead to serious adverse health outcomes including cardiovascular and neurological disease. See Section 3.2 for further detail.

Data source and considerations: Data on infectious syphilis are collected against nationally agreed data specifications and reported, by all jurisdictions, to NNDSS. See Methodological Notes for further detail. In the period 2010 – 2014, Aboriginal and Torres Strait Islander status was reported for more than 50% of notifications each year in all jurisdictions.

Results: In 2013 the age-standardised notification rate of infectious syphilis notification among the Aboriginal and Torres Strait Islander population was 21 per 100 000 population, with a relative 52% increase to 32 per 100 000 population in 2014 (Figure 45). In 2014, notification rates were higher among males (37.4 per 100 000 population) than females (27.1 per 100 000 population). Over the five-year period 2010 – 2014 notification rates have increased 46% from 21.9 per 100 000 population in 2005.

Figure 45 Infectious syphilis notification rate per 100 000 population, 2010 – 2014, by sex



	2010	2011	2012	2013	2014
Total	21.9	26.2	23.6	20.6	32.0
Male	25.9	28.7	27.4	23.4	37.4
Female	18.1	24.2	20.2	18.1	27.1

Source: NNDSS

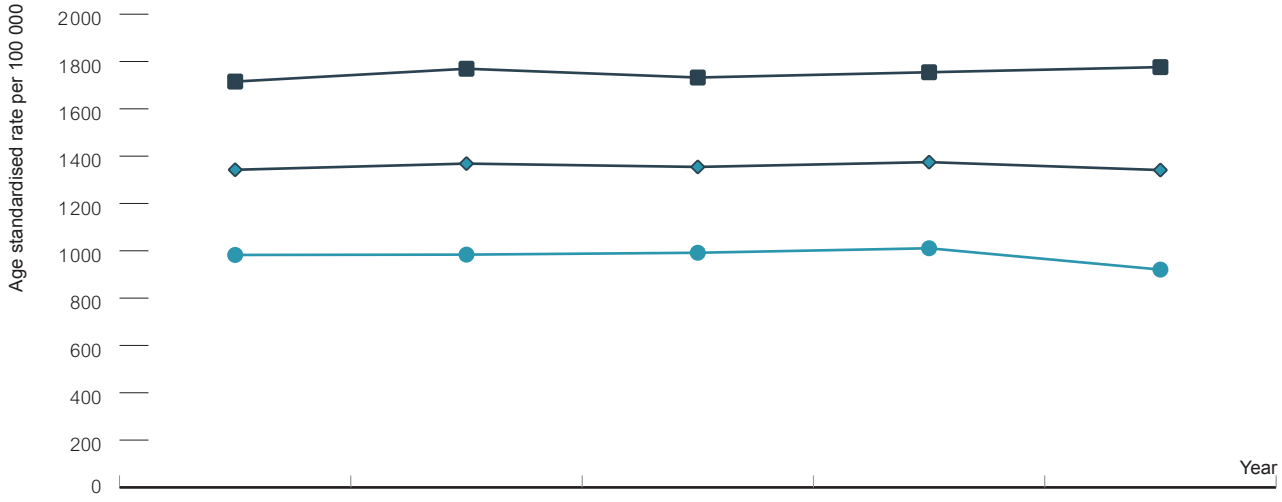
Chlamydia

Background: Untreated chlamydia can lead to pelvic inflammatory disease, infertility and ectopic pregnancy.[68 – 70] See Section 3.2 for further detail. Chlamydia is the most commonly notifiable infection in Australia, and Aboriginal and Torres Strait Islander people continue to experience a disproportionate disease burden.[71]

Data source and considerations: Data on chlamydia are collected against nationally agreed data specifications and reported, by all jurisdictions, to NNDSS. See Methodological Notes for further detail. In the period 2010 – 2014, Aboriginal and Torres Strait Islander status was not reported for more than 50% of notifications each year in the Australian Capital Territory, New South Wales, Tasmania and Victoria and as such notification data for chlamydia excludes these jurisdictions. Hereinafter, notification data for the period 2010-2014 refers to the Northern Territory, Queensland, South Australia, and Western Australia.

Results: In 2013, the chlamydia notification rate for the Aboriginal and Torres Strait Islander population was 1 375 per 100 000 population, compared to 1 341 per 100 000 population in 2014, representing a 2% relative decrease (Figure 46). The notification rates among females were 1 755 per 100 000 population in 2013 and 1 776 per 100 000 population in 2014. In both years notification rates were lower among Aboriginal and Torres Strait Islander males, at 1 011 per 100 000 population in 2013 and 921 per 100 000 population in 2014. Over the five-year period 2010 – 2014, notification rates have remained relatively stable at 1 342 per 100 000 population in 2005.

Figure 46 Chlamydia notification rate per 100 000 population, 2010 – 2014, by sex



	2010	2011	2012	2013	2014
Total	1 342.4	1 368.5	1 354.4	1 374.7	1 341.2
Male	982.4	983.8	991.7	1 010.7	920.5
Female	1 715.2	1 769.4	1 732.3	1 754.6	1 776.3

Source: NNDSS

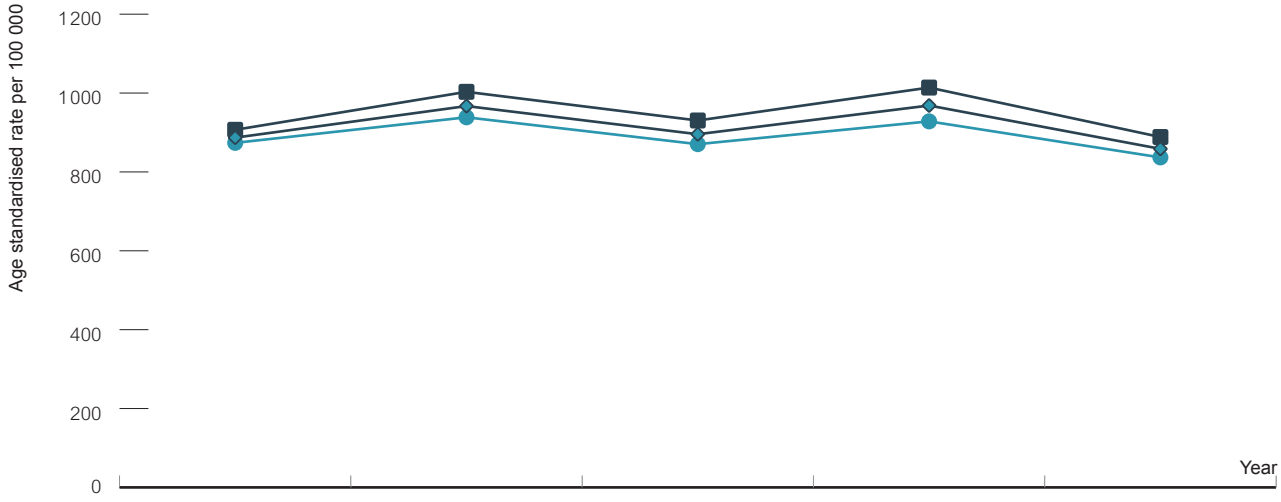
Gonorrhoea

Background: Gonorrhoea has similar symptoms and sequelae to chlamydia (described above), and untreated may also lead to disseminated gonococcal infection.[29, 72] Unlike chlamydia, symptomatic disease is more common, particularly in men.[29]

Data source and considerations: Data on gonorrhoea are collected against nationally agreed data specifications and reported, by all jurisdictions, to NNDSS. See Methodological Notes for further detail. In the period 2010 – 2014, Aboriginal and Torres Strait Islander status was reported for less than 50% of notifications per year in New South Wales and Queensland, and as such, notification data for gonorrhoea excludes these jurisdictions. Hereinafter, notification data for the period 2010 – 2014 refers to the Northern Territory, South Australia, Tasmania, Victoria, the Australian Capital Territory and Western Australia.

Results: In 2013, the gonorrhoea notification rate for the Aboriginal and Torres Strait Islander population was 968 per 100 000 population in 2013 with a relative 11% decrease to 859 per 100 000 population in 2014 (Figure 47). Notification rates among females were 1 014 per 100 000 population in 2013 and 889 per 100 000 population in 2014. In both years notification rates were lower among Aboriginal and Torres Strait Islander males, at 928 per 100 000 population in 2013 and 837 per 100 000 population in 2014. Notification rates have decreased by 3% since 2005, when the rate was 887 per 100 000 population.

Figure 47 Gonorrhoea notification rate per 100 000 population, 2010 – 2014, by sex



	2010	2011	2012	2013	2014
Total	886.9	967.0	895.6	968.4	858.5
Male	873.7	938.5	870.4	928.2	836.8
Female	906.8	1003.1	930.4	1 013.9	888.5

Source: NNDSS

5.2c *Number of notifications of congenital syphilis annually*

Indicator definition

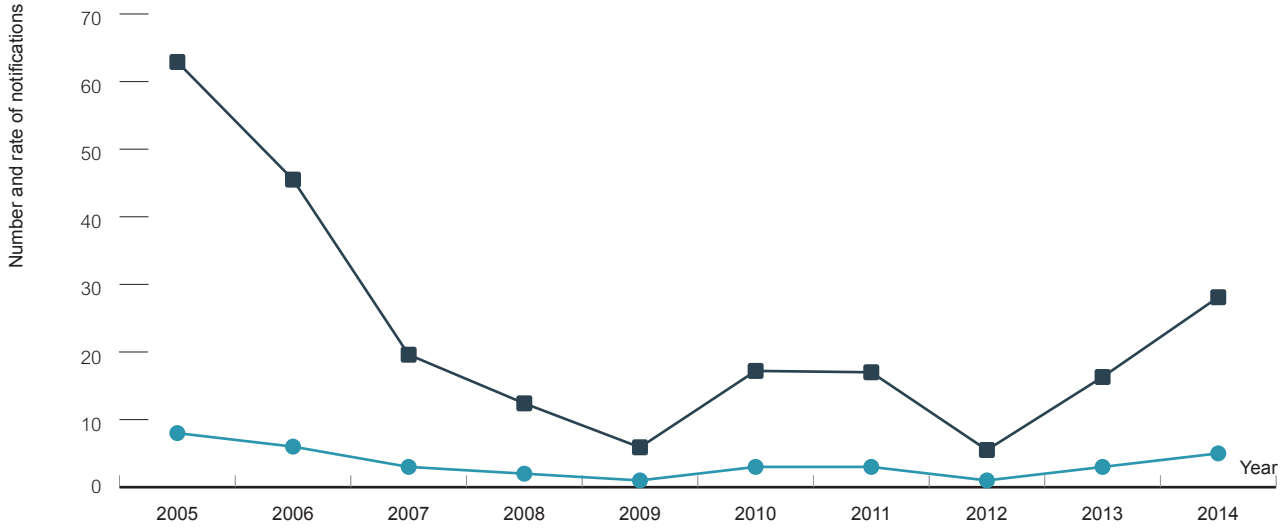
Single measure	Number of congenital syphilis notifications reported as Aboriginal and Torres Strait Islander people to NNDSS

Background: Syphilis can also be passed on to the unborn infant during pregnancy, resulting in miscarriage, stillbirth, neonatal death, and other serious health consequences for the child, including blindness, deafness and intellectual disabilities.[73]

Data source and considerations: Data on congenital syphilis are collected against nationally agreed data specifications and reported by all jurisdictions, to NNDSS. The number of births is sourced from the Australian Bureau of Statistics 3301.0 Births, Australia, 2014. See Methodological Notes for further detail. Current systems do not collect clinical information about the cases.

Results: In 2013 the rate of Aboriginal and Torres Strait Islander congenital syphilis notifications was 16.3 per 100 000 live births, with a 72% relative increase to 28.1 per 100 000 live births in 2014 (Figure 48), though the actual number of cases is small. Notifications of congenital syphilis in the Aboriginal and Torres Strait Islander population declined from 8 in 2005 to 1 in 2009, and then increased to 5 in 2014. All 5 cases in 2014 were from the Aboriginal and Torres Strait Islander population (see section 3.5 for information on all notifications).

Figure 48 Number of Aboriginal and Torres Strait Islander congenital syphilis notifications, and rate of notification per 100 000 live births, 2005 – 2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of notifications	8	6	3	2	1	3	3	1	3	5
Rate per 100 000 live births	62.9	45.5	19.6	12.4	5.9	17.2	17.0	5.5	16.3	28.1

Source: NNDSS; ABS

5.2.1 Achieve high levels of HPV vaccination

5.2.1 HPV three dose vaccination coverage for males and females turning 15 years of age.

Indicator definition

Numerator	Number of Aboriginal and Torres Strait Islander males and females turning 15 years of age reported to the NHVPR that comply with the recommended vaccine dosage and administration as per the Australian Immunisation Handbook
Denominator	Aboriginal and Torres Strait Islander population reported by Australian Bureau of Statistics (ABS)

Data source and considerations: HPV vaccination coverage data are derived from the National Human Papillomavirus Vaccination Program Register (NHVPR). Indigenous status is a non-mandatory field for reporting to the NHVPR, with completeness of this field varying over time and across jurisdiction. Current Indigenous status completeness estimates are poor and therefore data are not available; however, work is ongoing to improve reporting particularly in the school-based program.

5.2.2 Reduce the risk behaviours associated with transmission of STIs

An indicator to monitor this objective is currently unavailable. Options will be explored to develop an indicator that informs activities and strategies in a meaningful way.

5.2.3 Increase appropriate testing and follow up among those at elevated risk

5.2.3 Proportion of 15 – 29 year olds receiving chlamydia test in the previous 12 months

Indicator definition

Numerator	Number of Aboriginal and Torres Strait Islander people aged 15 – 29 years who report having a chlamydia tests in the previous 12 months reported the GOANNA study
Denominator	Number of Aboriginal and Torres Islander people in the GOANNA study

Background: Chlamydia is the most frequently notified infectious disease in Australia, with highest numbers in the 15 – 29 year age group.[3] Chlamydia notification rates have been consistently higher among the Aboriginal and Torres Strait Islander population compared to the non-Indigenous, and were three times higher in 2014.[3] With the majority of chlamydia infections asymptomatic, regular STI testing is an important prevention strategy to ensure timely detection and treatment.[74] National guidelines recommend annual chlamydia testing for all 15 – 29 year olds.[75]

Data source and considerations: Similar mechanisms to measure this indicator as described under objective 3.2 of the STI Strategy, cannot be applied to the Aboriginal and Torres Strait Islander population due to poor completeness of the Voluntary Indigenous Identifier (VII) field collected through Medicare registration forms. The VII, introduced in 2002, covers approximately 50% of the Aboriginal and Torres Strait Islander population and is likely to take a number of years before the data is sufficient to use for this purpose.

The once-off 'Sexual health and relationships in young Indigenous people study' (GOANNA),[76] collected data on participant demographics, STI and BBV risk knowledge, sexual behaviours and access to health services. See section Methodological Notes for detail.

Results: Results from the GOANNA study found that testing for an STI test in the last year was reported by 29%, 51% and 52% of 16 – 19, 20 – 24 and 25 – 29 year old participants respectively.

5.3 Reduce the incidence of BBV

5.3a Annual rate of notifications of newly acquired hepatitis B

Indicator definition

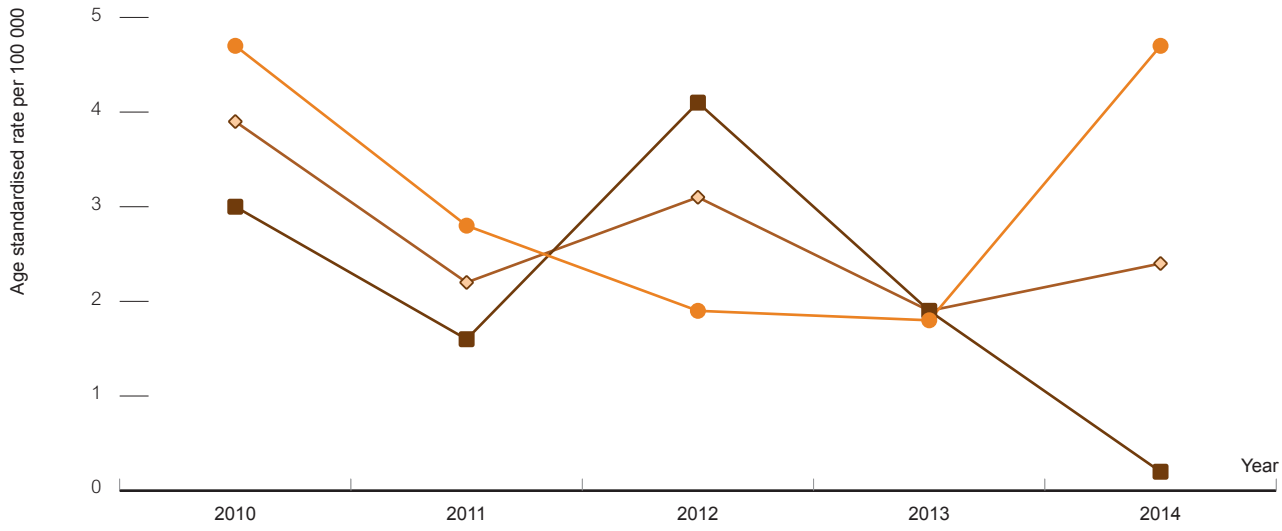
Numerator	Number of newly acquired hepatitis B notifications reported as Aboriginal and Torres Strait Islander people to NNDSS
Denominator	Aboriginal and Torres Strait Islander population reported by Australian Bureau of Statistics (ABS)

Background: While immediate treatment of hepatitis B is not recommended, early identification of hepatitis B infection ensures people receive appropriate care and treatment, and onward transmission can be reduced.[77] Despite the introduction of a universal hepatitis B vaccination program in 1990 in the Northern Territory and 2000 for the rest of Australia, the prevalence of hepatitis B is still higher among the Aboriginal and Torres Strait Islander population than the non-Indigenous population.[71] Newly acquired hepatitis B infection is defined as newly diagnosed hepatitis B infection in a person previously known not to have the infection within the last two years. For some newly diagnosed cases, it is possible to determine that they were acquired in the 2 years prior to diagnosis, on the basis of a prior negative test.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. Data on hepatitis B diagnoses are collected against nationally agreed data specifications and reported by all jurisdictions, to NNDSS. See Methodological Notes for further detail. Also determination of a case as 'newly acquired' is heavily reliant on public health follow-up, with the method and intensity of follow-up varying by jurisdiction and over time. Information on Aboriginal and Torres Strait Islander status was reported for more than 50% of notifications of newly acquired hepatitis B infection in all jurisdictions.

Results: Between 2013 and 2014, there was a 26% relative increase in Aboriginal and Torres Strait Islander newly acquired hepatitis B notifications (from 1.9 to 2.4). Given the small number of notifications, this increase should be interpreted with caution. In the five-year period 2010 – 2014 the notification rate of newly acquired hepatitis B infection in the Aboriginal and Torres Strait Islander population fluctuated between 2 and 4 per 100 000 population (Figure 49).

Figure 49 Newly acquired hepatitis B notification rate per 100 000 population, 2010 – 2014, by sex



	2010	2011	2012	2013	2014
Total	3.9	2.2	3.1	1.9	2.4
Male	4.7	2.8	1.9	1.8	4.7
Female	3.0	1.6	4.1	1.9	0.2

Source: NNDSS

5.3b *Annual rate of notifications of newly acquired hepatitis C*

Indicator definition

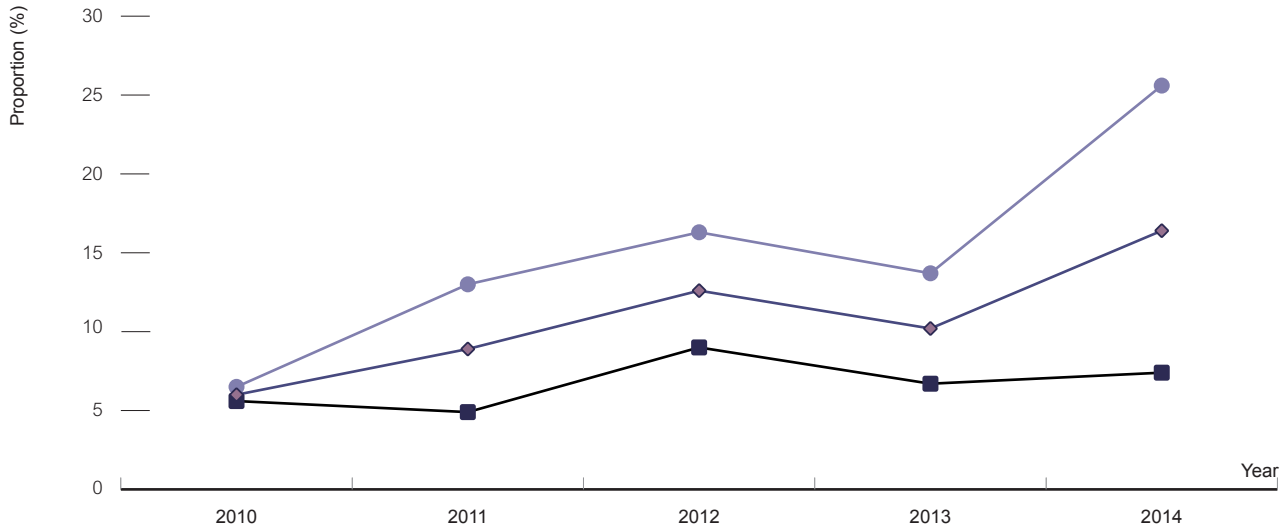
Numerator	Number of newly acquired hepatitis C notifications reported as Aboriginal and Torres Strait Islander people to NNDSS
Denominator	Aboriginal and Torres Strait Islander population reported by ABS

Background: Newly acquired hepatitis C infection means that a person previously known not to have the infection within the last two years has been tested and now found to have the infection. These data on newly acquired infections should be interpreted with caution as they are likely to under-estimate the true number of newly acquired infections in the community for a number of reasons: infections are rarely symptomatic in the early stages and most cases will therefore remain undetected. Also, even if testing is conducted, it may be difficult to distinguish a newly diagnosed case as newly acquired unless there is a history of a recent negative test prior to the positive diagnosis or clinical evidence of newly acquired hepatitis C.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. Data on hepatitis C diagnoses are collected against nationally agreed data specifications and reported by all jurisdictions, to NNDSS. See Methodological Notes for further detail. For some newly diagnosed cases of hepatitis C, it is possible to determine that they were acquired in the two years prior to diagnosis, on the basis of a prior negative test or clinical evidence. This information is only available for states/territories which conduct enhanced surveillance so do not reflect the true number of newly acquired cases. Information on Aboriginal and Torres Strait Islander status was reported for more than 50% of notifications of newly acquired hepatitis C infection in all jurisdictions except Queensland, where all hepatitis C cases are notified as unspecified.

Results: In 2013 the rate of Aboriginal and Torres Strait Islander newly acquired hepatitis C notifications was 10 per 100 000 population, with a 57% relative increase to 16 per 100 000 population in 2014. In the five-year period 2010 – 2014, the notification rate of newly acquired hepatitis C infection in the Aboriginal and Torres Strait Islander population increased from 6 in 2010 to 16 in 2014 (Figure 50). In 2013, notification rates of newly acquired hepatitis B among Aboriginal and Torres Strait Islander males were two times higher than rates in females. The difference increased in 2014, with notification rates among Aboriginal and Torres Strait Islander males 3.5 times higher than rates among females (Figure 50).

Figure 50 Newly acquired hepatitis C notification rate per 100 000 population, 2010 – 2014, by sex



	2010	2011	2012	2013	2014
Total	6.0	8.9	12.6	10.2	16.4
Male	6.5	13.0	16.3	13.7	25.6
Female	5.6	4.9	9.0	6.7	7.4

Source: NNDSS

5.3c *Estimated incidence of recent HIV infection*

Indicator definition

Numerator	Number of newly diagnosed HIV infection notifications reported as Aboriginal and Torres Strait Islander people to the National HIV Registry
Denominator	Aboriginal and Torres Strait Islander population reported by ABS

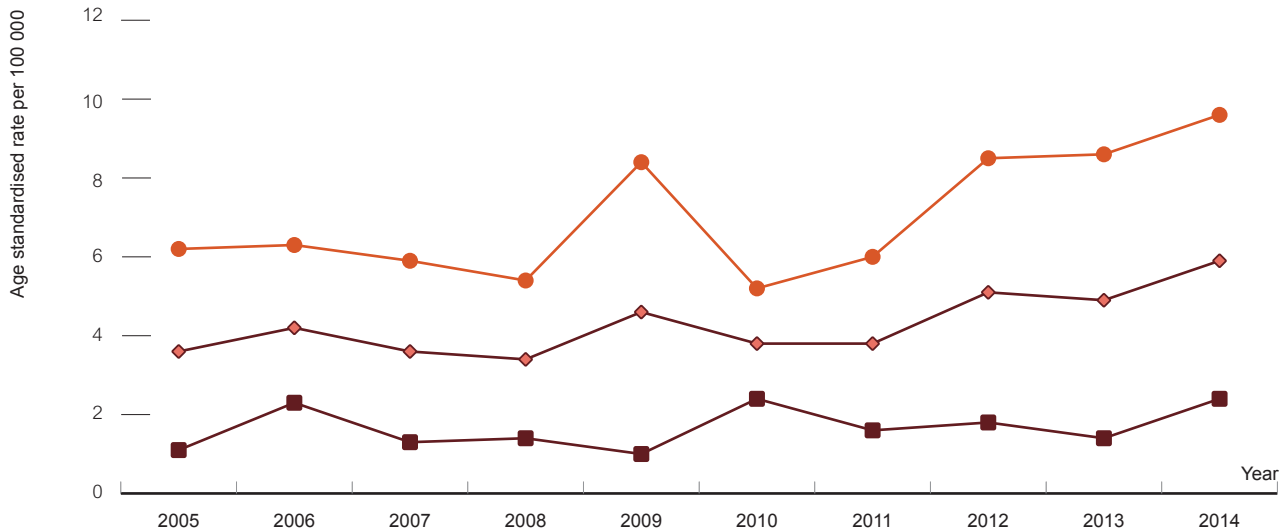
Background: HIV incidence is defined as the number of new HIV infections in a population during a specified time period. Understanding HIV incidence in a population is important to monitor the epidemic, improve the development and implementation of interventions and to evaluate the impact of prevention and treatment programs.[48] Reported numbers of diagnoses of HIV can be used to monitor the trends of transmission in Australia. However, trends in diagnoses may only reflect trends in incidence if testing is relatively frequent and rates of testing are relatively constant among people at risk of HIV infection.

Data source and considerations: Incidence is a difficult indicator to measure, and notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases and may be influenced by changes to testing patterns. HIV infection is a notifiable disease in each State/Territory health jurisdiction in Australia. All new HIV diagnoses are reported by doctors and laboratories to State/Territory health authorities. See Methodological Notes for further detail. All jurisdictions have >95% completeness rates for Aboriginal and Torres Strait Islander status in HIV notifications and thus data from all jurisdictions are included.

Results: The notification rate of newly diagnosed HIV in the Aboriginal and Torres Strait Islander population was 4.9 per 100 000 population in 2013, with a 20% relative increase to 5.9 per 100 000 population in 2014. In the past ten years, the notification rate of newly diagnosed HIV infection in the Aboriginal and Torres Strait Islander population was 3.6 per 100 000 population in 2005, remained fairly stable between 2006 and 2011 and then increased in 2012 – 2014, reaching 5.9 per 100 000 population in 2014 (Figure 51).

The notification rate of newly diagnosed HIV infection in Aboriginal and Torres Strait Islander males fluctuated over the ten year period, with an increase in 2009, a decline in 2010 and an increase in 2012 – 2014 (6.2 in 2005, 8.4 in 2009, 5.2 in 2010 and 9.6 per 100 000 population in 2014). The notification rates of newly diagnosed HIV infection among Aboriginal and Torres Strait Islander females fluctuated between 1.1 per 100 000 population in 2005 to 2.4 per 100 000 population in 2014 (Figure 51).

Figure 51 Newly diagnosed HIV notification rate in the Aboriginal and Torres Strait Islander population per 100 000 population, 2005 – 2014, by sex



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	3.6	4.2	3.6	3.4	4.6	3.8	3.8	5.1	4.9	5.9
Males	6.2	6.3	5.9	5.4	8.4	5.2	6.0	8.5	8.6	9.6
Females	1.1	2.3	1.3	1.4	1.0	2.4	1.6	1.8	1.4	2.4

Source: State and territory health authorities

5.3.1 Achieve high levels of hepatitis B vaccination

5.3.1a Hepatitis B immunisation coverage in children at 12 and 24 months.

Indicator definition

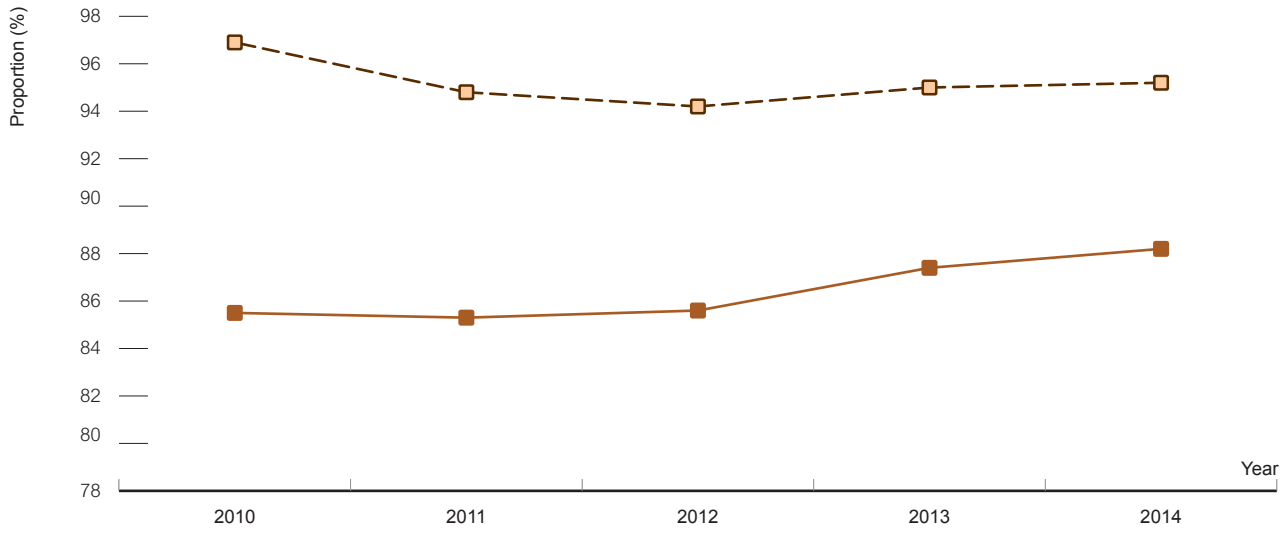
Numerator	Number of Aboriginal and Torres Strait Islander children in the relevant birth cohort who have been administered dose three of hepatitis B vaccine by 12 months of age recorded on the ACIR
Denominator	Number of Aboriginal and Torres Strait Islander children turning 12 months of age in the measurement year on the ACIR
Numerator	Number of Aboriginal and Torres Strait Islander children in the relevant birth cohort who have been administered dose three of hepatitis B vaccine by 24 months of age recorded on the ACIR
Denominator	Number of Aboriginal and Torres Strait Islander children turning 24 months of age in the measurement year on the ACIR

Background: Hepatitis B vaccination, including universal infant vaccination, is the most effective prevention measure for hepatitis B. Hepatitis B vaccination for Aboriginal and Torres Strait Islander infants was introduced in the Northern Territory in 1988, expanding to all newborns in 1990.[5] Australia wide universal vaccination was introduced in 2000[78]. Rates of hepatitis B are disproportionately higher in the Aboriginal and Torres Strait Islander population than the non-Indigenous[3], highlighting the importance of high vaccination coverage in this population.

Data source and considerations: Hepatitis B vaccine coverage was estimated using data from the National Centre for Immunisation Research of Vaccine Preventable Diseases (NCIRS) surveillance of immunisation coverage and the Australian Childhood Immunisation Register (ACIR). See Methodological Notes for further detail. Data are only included from 2010 onwards, as the definition of 'fully vaccinated' changed in late 2009.[6]

Results: Hepatitis B vaccination coverage at 12 months was 86% in 2013, and 88% in 2014 and at 24 months was stable between both years, at 95-96%. The lower rates at 12 months suggest issues around timeliness of completion of the course of vaccinations in Aboriginal and Torres Strait Islander children, which may lead to increased risk of disease acquisition. Over the five-year period 2010 – 2014, hepatitis B immunisation coverage rates at 12 months for Aboriginal and Torres Strait Islander children ranged from 85% to 88%, and at 24 months from 94% to 96% (Figure 52).

Figure 52 Hepatitis B vaccination coverage estimates at 12 and 24 months in Aboriginal and Torres Strait Islander children, 2010 – 2014



	2010	2011	2012	2013	2014
12 months	85.5%	85.3%	85.6%	86.4%	88.2%
24 months	96.9%	94.1%	94.2%	94.3%	96.0%

Source: NCIRS

5.3.2 Reduce the risk behaviours associated with the transmission of BBV

5.3.2a Proportion of people who inject drugs reporting re-using another person's used needle and syringe in the previous month.

Indicator definition

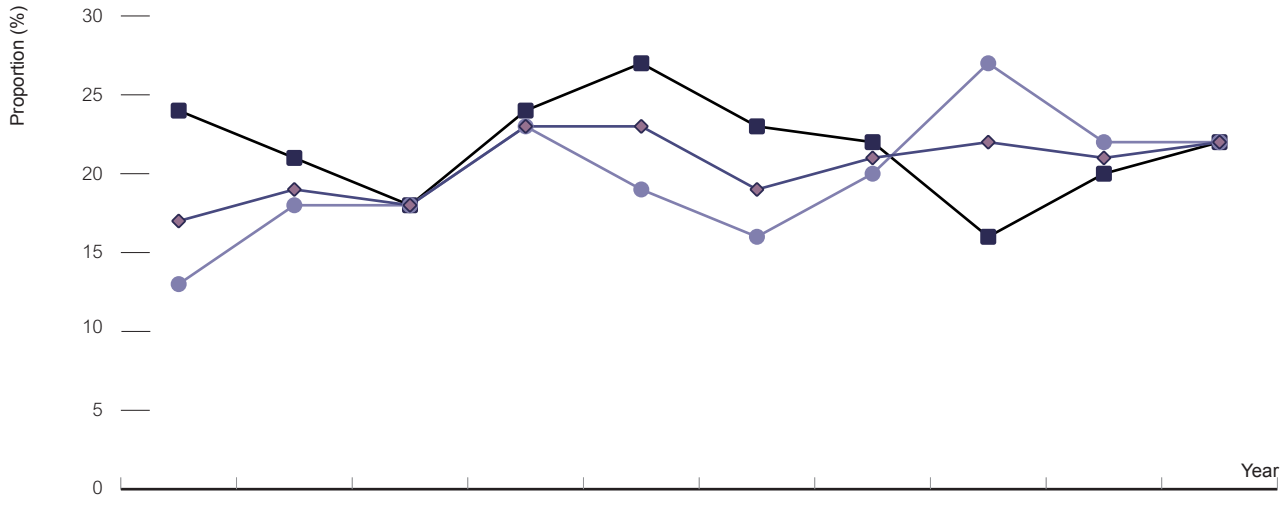
Numerator	Number of Aboriginal and Torres Strait Islander participants in the ANSPS who report re-using another person's used needle and syringe in the previous month (receptive syringe sharing)
Denominator	Total number of Aboriginal and Torres Strait Islander participants in the ANSPS

Background: Receptive syringe sharing is a major risk factor for the transmission of HIV, hepatitis and other blood borne viruses. Aboriginal and Torres Strait Islander people are overrepresented in surveys of people who inject drugs, suggested a higher prevalence of injecting drug use in this population.[79] Combined with information from research suggesting higher rates of risk behaviour,[80] this population is at increased risk of transmission of HIV and BBVs through injecting drug use. Monitoring of injecting behaviours is essential to better understand the ongoing risk of transmission.

Data source and considerations: Each year, the Australian Needle and Syringe Program Survey (ANSPS) documents the proportion of participants who report re-using another person's used syringe in the month preceding the survey.[81] Although the representativeness of Aboriginal and Torres Strait Islander people participating in the ANSPS is unknown, this group have comprised more than 10% of the ANSPS sample since 2004, with representation from all states and territories. In 2014 there were 312 (14%) Aboriginal and Torres Strait Islander respondents. See Methodological Notes for further detail.

Results: The proportion of Aboriginal and Torres Strait Islander respondents reporting receptive syringe sharing was 21% in 2013, similar to the 22% in 2014. Among all respondents, the proportion reporting receptive syringe sharing has increased between 2005 and 2014 (from 17% to 22%). Among male respondents the increase has been greater from 13% to 22%, while among females the proportion has decreased (from 24% to 22%) (Figure 53).

Figure 53 Proportion of Aboriginal and Torres Strait Islander people who inject drugs reporting receptive syringe sharing in the previous month



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	17%	19%	18%	23%	23%	19%	21%	22%	21%	22%
Males	13%	18%	18%	23%	19%	16%	20%	27%	22%	22%
Females	24%	21%	18%	24%	27%	23%	22%	16%	20%	22%

Source: ANSPS

5.3.2b *Number of Aboriginal and Torres Strait Islander people who are notified as newly diagnosed with HIV who report injecting drug use*

Indicator definition

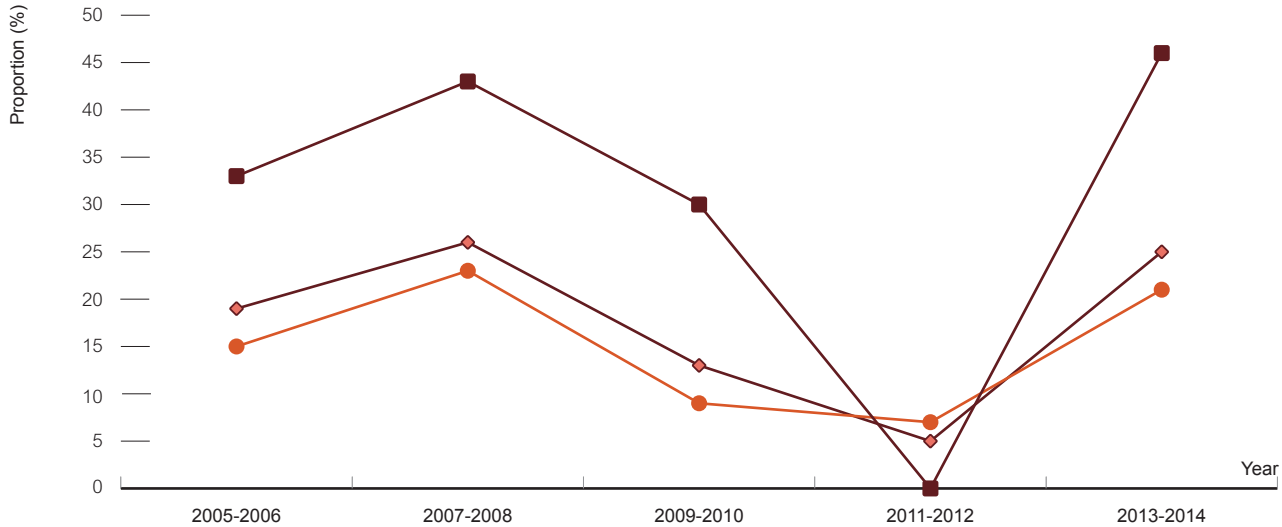
Numerator	Number of Aboriginal and Torres Strait Islander people who are newly diagnosed with HIV who report injecting drug use reported by National HIV Registry
Denominator	Number of Aboriginal and Torres Strait Islander people who are newly diagnosed with HIV reported by National HIV Registry

Background: Injecting drug use is a major risk factor for HIV transmission.[82] Aboriginal and Torres Strait Islander people are consistently over-represented in surveys of people who inject drugs, suggesting higher injecting use among the Aboriginal and Torres Strait Islander population.[83] See Section 5.3.2 for further detail.

Data source and considerations: HIV infection is a notifiable disease in each State/Territory health jurisdiction in Australia. All new HIV diagnoses are reported by doctors and laboratories to State/Territory health authorities. See Methodological Notes for further detail. Self-reported exposure category is allocated according to a hierarchy of risk. Due to the small number of Aboriginal and Torres Strait Islander notifications per exposure category, caution should be taken in interpretation of these data. Due to the small number of notifications, the data presented in the Figure below are aggregated into two year periods.

Results: In 2013 the proportion of Aboriginal and Torres Strait Islander HIV notifications attributed to injecting drug use was 23%, increasing by 4% to 27% in 2014. For the longer term trend, data are aggregated into two year periods due to the small number of notifications. Between 2005 and 2014, the total proportion in two year time blocks of Aboriginal and Torres Strait Islander notifications attributed to injecting drug use ranged from 5 – 26% (Figure 54).

Figure 54 Proportion of Aboriginal and Torres Strait Islander HIV notifications attributed to injecting drug use, 2005 – 2014, by sex



	2005-2006	2007-2008	2009-2010	2011-2012	2013-2014
Total*	19%	26%	13%	5%	25%
Male	15%	23%	9%	7%	21%
Female	33%	43%	30%	0%	46%

Note: Due to the small number of notifications, the data presented are aggregated into two year periods.
Source: State and Territory health authorities

5.3.3 Decrease the number with undiagnosed BBV

An indicator to monitor this objective is currently unavailable. Options will be explored to develop an indicator that informs activities and strategies in a meaningful way. While no specific indicator is currently available for this target, it is estimated that in 2014 20% of Aboriginal and Torres Strait Islander people living with HIV were undiagnosed.[3]

5.4 Increase the number receiving treatment and appropriate management, care and support for BBV

An indicator to monitor this objective is currently unavailable. Options will be explored to develop an indicator that informs activities and strategies in a meaningful way. Data on treatment uptake for HIV, hepatitis B and C among Aboriginal and Torres Strait Islander people were not available at the time of report preparation, but activities are planned to provide this information for future reports.

5.5 Eliminate the negative impact of stigma, discrimination and human rights issues on Aboriginal and Torres Strait Islander health

An indicator to monitor this objective is currently unavailable. Options will be explored to develop an indicator that informs activities and strategies in a meaningful way, see Section 1.6

5.5.1 Actively engage with the Aboriginal and Torres Strait Islander community

An indicator to monitor this objective is currently unavailable. Options will be explored to develop an indicator that informs activities and strategies in a meaningful way.

5.5.2 Improve delivery of and access to appropriate services

An indicator to monitor this objective is currently unavailable. Options will be explored to develop an indicator that informs activities and strategies in a meaningful way.

Methodological notes

It is recognised that there are a number of gaps in reporting in the first year of the National Strategies. A number of targets and objectives do not yet have associated indicators identified, as detailed below.

HIV target 7:
Maintain effective prevention programs targeting sex workers and for people who inject drugs

An indicator is not yet identified for HIV target 7 however, it is recognised that HIV prevention among sex workers has been highly successful in Australia and has resulted in HIV incidence rates among the lowest in the world. There is international documentation of the best measures of effective prevention programs,[1] and discussions are ongoing as to the most relevant data to report on this target in Australia.

Objectives 1.6, 2.5, 3.6, 4.6:
Eliminate the negative impact of stigma, discrimination, and legal and human rights issues on people's health

The Centre for Social Research in Health, UNSW has received funding from the Australian Government Department of Health to develop an indicator of stigma among priority groups identified by the five national strategies addressing blood borne viruses (BBVs) and sexually transmissible infections. However, at this stage, the project has been resourced for the indicator to be implemented with some priority groups including in existing routine surveys of people who inject drugs and men who have sex with men and in new surveys of people living with HIV and hepatitis C. The indicator will monitor experiences of stigma within these samples in relation to BBV status, injection drug use, sexual orientation and sex work. A mirrored indicator will also be included in a new survey of health care providers to monitor the expression of stigma. Data will be collected between April and October 2016, and a final report produced by December 2016.

Equally, enabling social and legal environments are essential to evidence-based prevention, treatment, care and support. At this stage there has been no work on an indicator for legal or human rights issues.

Objective 5.2.2:
Reduce the risk behaviours associated with transmission (in the Aboriginal and Torres Strait Islander population)

There is no indicator identified for this objective. There is currently no regular periodic survey of young Aboriginal and Torres Strait Islander people, but discussions are ongoing as to available data to inform this objective.

Objective 5.4:
Increase the number of Aboriginal and Torres Strait Islander people with BBV receiving appropriate management, case and support for BBV.

Work is being undertaken to develop a cascade of care for HIV, hepatitis C and chlamydia for the Aboriginal and Torres Strait Islander population, which will inform this objective. It is expected that data will be available for the next reporting period.

It is also acknowledged that a number of targets and indicators do not have appropriate or recent data available.

Indicator 1.2b
Additional information: Proportion of population attending STI clinics vaccinated or with past infection for hepatitis B

Data are not available for specific priority populations which may mask any differences between populations, and further work is being done to present these data by specific priority population in future reports. This will provide valuable information to inform targeted vaccination programs for priority populations.

The hepatitis B diagnosis and care cascade (Indicators 1.3a, 1.4a, 1.4b)

The hepatitis B diagnosis and care cascade (see below for further detail) is only available for 2013, as such, reporting on hepatitis B targets 3 and 4 and indicators 1.3a, 1.4a and 1.4b is not possible for 2014. The hepatitis B diagnosis and care cascade will be updated to the most recent year in subsequent reports.

Incidence

Incidence is a difficult indicator to measure, and for a number of indicators notifications have been used as a surrogate, recognising that for most infections, they represent only a proportion of the total cases (e.g. only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities). Also annual changes in notifications may represent responses to testing policies and programs, different diagnostic tests and awareness campaigns rather than true changes in incidence.

Objective 3.3:
Improve knowledge and reduce risk behaviours associated with the transmission of STI

The National Survey of Australian Secondary School Students and Sexual Health is only conducted every five years, and as such, the most recent data available is for 2013. As new data become available they will be included in subsequent reports.

Objective 4.5:
Improve quality of life of people living with HIV

Data for 2013 and 2014 are not available for this Objective. The HIV Futures Study is conducted every 2-3 years (see below for further detail), with the most recent survey carried out over 6 months from October 2011 to March 2012. As new data become available they will be added to subsequent reports.

Objective 5.1:
Improve the knowledge and awareness of STI and BBV and Objective 5.2.3: Increase appropriate testing and follow-up among those at elevated risk

The 'Sexual Health and Relationships in young Indigenous people study' (GOANNA – see below for further detail) the first national survey of young Aboriginal and Torres Strait Islander people in relation to STIs and BBVs undertaken in Australia was undertaken during 2011 – 2013. As such, no data are available for this indicator for 2014. There is currently no regular periodic survey of young Aboriginal and Torres Strait Islander people.

Objective 5.3.3:
Decrease the number of Aboriginal people with undiagnosed BBV

Work is being undertaken to develop a cascade of care for HIV, hepatitis C and chlamydia for the Aboriginal and Torres Strait Islander population. It is expected that data will be available for the next reporting period.

The below information provides further detail on the different data sources used to calculate progress against the various objectives and indicators. The data sources and indicators were selected to provide as complete as possible national data, and no state/territory level breakdowns are given. However it is important to note that individual state-based reporting may use different data sources to track progress. For all: notification rates are calculated based on the annual number of newly notified cases per 100 000 population; incidence rates are calculated based on the number of new cases out of a person-time denominator.

Australian National Notifiable Diseases Surveillance System

The National Notifiable Diseases Surveillance System (NNDSS) (http://www.health.gov.au/internet/main/publishing.nsf/content/cda-surveil-nndssndssintro.htm) was established in 1990 under the auspices of the Communicable Diseases Network Australia. NNDSS co-ordinates the national surveillance of more than 50 communicable diseases or disease groups. Under this scheme, notifications are made to the State or Territory health authority under the provisions of the

public health legislation in their jurisdiction. Computerised, de-identified unit records of notifications are supplied to the Australian Government Department of Health on a daily basis, for collation, analysis and publication on the Internet, and in the quarterly journal Communicable Diseases Intelligence.

Notification data provided include a unique record reference number, state or territory identifier, disease code, date of onset, date of notification to the relevant health authority, sex, age, Aboriginal and Torres Strait Islander status and postcode of residence.

Notified cases over time do not solely reflect changes in disease prevalence. Changes in testing policies; screening programs, including preferential testing of high-risk populations; the use of less invasive and more sensitive diagnostic tests; and periodic awareness campaigns, may influence the number of notifications that are received over time.[84] Another major limitation of the notification data is that they represent only a proportion of the total cases occurring in the community, that is, only those cases for which health care was sought, a test conducted and a diagnosis made, followed by a notification to health authorities. The degree of under-representation of all cases is unknown but is most likely variable by jurisdiction.

Viral hepatitis

New diagnoses of hepatitis B and C were notifiable conditions in all State/Territories in Australia. Diagnosis of newly acquired hepatitis B infection was notifiable in all health jurisdictions. Diagnoses of newly acquired hepatitis C infection were recorded in all health jurisdictions other than Queensland. Cases were notified by the diagnosing laboratory, medical practitioner, hospital or a combination of these sources, through State/Territory health authorities, to the National Notifiable Diseases Surveillance System (NNDSS). Population rates of diagnosis of viral hepatitis were calculated for each State/Territory using yearly population estimates, provided by the Australian Bureau of Statistics. Hepatitis B infection and hepatitis C infection was classified as newly acquired if evidence was available of acquisition in the 24 months prior to diagnosis (Communicable Diseases Network Australia 2004).

Sexually transmissible infections

Diagnoses of specific sexually transmissible infections were notified by State/Territory health authorities to the National Notifiable Disease Surveillance System (NNDSS), maintained by the Australian Government Department of Health. Chlamydia has been notifiable in all health jurisdictions since 1998, Gonorrhoea since 1991 and infectious syphilis became notifiable in all jurisdictions in 2004. In most health jurisdictions, diagnoses of sexually transmissible infections were notified by the diagnosing laboratory, the medical practitioner, hospital or a combination of these sources (see Table below).

	Australian Capital Territory	New South Wales	Northern Territory	Queensland	South Australia	Tasmania	Victoria	Western Australia
Diagnosis								
Gonorrhoea	Doctor Laboratory Hospital	Laboratory	Doctor Laboratory	Doctor Laboratory Hospital	Doctor Laboratory	Doctor Laboratory Hospital	Doctor Laboratory	Doctor
Infectious Syphilis	Doctor Laboratory Hospital	Doctor Laboratory Hospital	Doctor Laboratory	Doctor Laboratory Hospital	Doctor Laboratory	Doctor Laboratory Hospital	Doctor Laboratory	Doctor
Chlamydia	Doctor Laboratory Hospital	Laboratory	Doctor Laboratory	Doctor Laboratory Hospital	Doctor Laboratory	Laboratory	Doctor Laboratory	Doctor
Donovanosis	Not notifiable	Laboratory	Doctor Laboratory	Doctor Laboratory Hospital	Doctor Laboratory	Laboratory	Doctor Laboratory	Doctor Laboratory

Respective rates of notification for chlamydia, gonorrhoea and infectious syphilis were calculated using analogous procedures to those described below for HIV notifications (see HIV new diagnoses methodology). The number of notifications of congenital syphilis were obtained from the NNDSS.

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

Briefly, the ACCESS Project is a sexual health surveillance network which uses routinely collected de-identified demographic, testing, diagnosis and treatment data from health services and laboratories across Australia to monitor the sexual health of high risk population groups. Groups include gay and bisexual men, injecting drug users, Aboriginal and Torres Strait Islander people, sex workers, and young people. The ACCESS project has been described in more detail elsewhere.[85] The project is managed collaboratively between the Kirby Institute, Burnet Institute and the National Reference Laboratory. In total, ACCESS collects data from over 110 health services, pharmacies and laboratories. The ACCESS Sexual Health Clinic network comprises a total of 52 clinics in all Australian jurisdictions. Only clinics that could provide complete data for the entire reporting period were included in this report, resulting in the exclusion of eight clinics. In total, 44 sexual health clinics from four Australian jurisdictions provided data for this report: 19 located in major cities, 14 inner regional, 8 outer regional, and 4 in remote or very remote areas. There are 6 high case load general practice clinics in New South Wales and Victoria in ACCESS, and data from 4 were included in this report.

The hepatitis B diagnosis and care cascade

Cascade estimates were developed by the Epidemiology Unit, Victorian Infectious Diseases Reference Laboratory, Doherty Institute.

Diagnosis

The proportion of people living with chronic hepatitis B who have been diagnosed was estimated using model-derived estimates of the total number of people who have ever had chronic hepatitis B in Australia as the denominator and the cumulative number of notifications of hepatitis B from 1971 – 2013 as the numerator. Mortality is not included in this aspect of the analysis, and therefore the proportion derived represents those ever having lived with chronic hepatitis B who have ever been diagnosed.

Monitoring

The number of people who received monitoring for chronic hepatitis B in 2013 was determined using Department of Human Services data regarding rebate for an annual hepatitis B viral load test, which is recommended for all people living with chronic hepatitis B. This item is specific to people living with chronic hepatitis B who are not receiving treatment, and is limited to one test per year.

Treatment

The number of people receiving treatment for chronic hepatitis B in 2013 was derived using pharmaceutical dispensing data from the Department of Human Services Australia regarding the number of individuals receiving a treatment indicated for hepatitis B virus infection (adefovir, entecavir, lamivudine, telbivudine, tenofovir, and pegylated interferon). Patient-level estimates were provided, allowing removal of those receiving tenofovir for the treatment of HIV and to avoid duplication of people receiving combination therapy.

Detailed methodology and source references can be found in the published paper which described the derivation of these estimates[86] and in the 2nd National Report of the Hepatitis B Mapping Project (www.ashm.org.au/hbvmapping).

A combined estimate of people in care for chronic hepatitis B was derived by combining the number who received monitoring while not on treatment and those on treatment. Each of these estimates are expressed as a proportion of the total number living with chronic hepatitis B as derived using the prevalence methodology outlined.

Number of people living with hepatitis B

Estimates of the number of people living with hepatitis B virus infection in Australia were developed by the Epidemiology Unit, Victorian Infectious Diseases Reference Laboratory, Doherty Institute. These estimates were derived from two sources:

The overall prevalence of chronic hepatitis B was determined using a deterministic compartmental mathematical model of hepatitis B virus infection in the Australian population from 1951 – 2050. The model was parameterised using a wide range of data sources including the Australian Bureau of Statistics, existing mathematical models, surveillance notifications, epidemiological research and clinical studies. Important factors such as migration, attributable and all-cause mortality, the ageing of the population, the variable natural history of chronic hepatitis B infection and the impact of vaccination were all incorporated. Model construction included sensitivity analyses around critical

parameters such as the force of infection (FoI) and migration estimates. Model outcomes have been validated using a range of external data, particularly national and Victorian serosurvey results. These were not used to parameterise the model to allow independent comparison with modelled outcomes. The plausible range around estimates of hepatitis B prevalence was generated using the range of uncertainty inherent in original prevalence estimates applied in the Census-based methodology described above, with the range in estimated attributable deaths derived by adopting low and high mortality estimates directly in the model.

The proportion of people living with chronic hepatitis B in each population group and the relative prevalence in each was determined using the Census method, attributing prevalence of chronic hepatitis B by country of birth, Aboriginal and Torres Strait Islander status, and other risk status applied to Australian population data provided in the 2011 Census. The estimated prevalence in these groups was derived as a proportion of the total Census population as estimated in 2011, and then applied of the estimated number of people living with chronic hepatitis B in 2014 derived using the mathematical model as outlined above. Detailed methodology and sources, including individual seroprevalence estimates and population figures, can be obtained from the published paper.[87]

HBV prevalence

The estimated prevalence of chronic hepatitis B according to country of birth was derived from combining multiple published sources into an average point estimate. The estimates used comprised two Australian antenatal seroprevalence studies[88, 89]; a study of hepatitis B prevalence in migrants to the United States[90]; and the most recent global seroprevalence study conducted as part of the Global Burden of Disease Project.[91] The Australian prevalence figure was obtained from local modeled estimates.[86]

Hepatitis C diagnosis and care cascade

Number of people living with hepatitis C

This estimate was derived using a difference equation mathematical model produced collaboratively between the Center for Disease Analysis and the Kirby Institute. The model uses estimates of the number of people who had injected drugs in Australia over the last three decades, the pattern of injecting drug use and estimates of hepatitis C incidence among people who inject drugs derived from cohort studies, to determine hepatitis C incidence as a result of injecting drug use. These estimates of HCV incidence due to injecting drug use were then adjusted in accordance with epidemiological data to allow for hepatitis C infections through other transmission routes, including nosocomial infection in migrants. Estimates of the number of people experiencing long term sequelae of chronic hepatitis C infection were then obtained from the estimated pattern of hepatitis C incidence using rates of progression derived from cohort studies. Estimates of the numbers of people living with chronic hepatitis C infection in 2014 were adjusted to allow for mortality related to hepatitis C infection, injecting drug use and unrelated to hepatitis C infection or injecting. Further information about the methods can be obtained by contacting the Center for Disease Analysis http://www.centerforda.com/

Number of people diagnosed and living with chronic hepatitis C infection

All hepatitis C notifications from 1991 to 2014 were totalled. The total hepatitis C notification numbers was adjusted for spontaneous hepatitis C clearance, mortality and hepatitis C cure. The proportion with spontaneous hepatitis C clearance was estimated at 20%. The proportion with mortality among people with a hepatitis C notification in NSW (1993 – 2012) was extrapolated to the total number of hepatitis C notifications in Australia. The estimated number of individuals with cure of hepatitis was deducted from the number of total hepatitis C notifications.

Number of people who have ever received HCV treatment

The numbers of hepatitis C treatment prescriptions dispensed to public patients, reported by the Pharmaceutical Benefits Scheme (PBS) were used for this estimate. The numbers of hepatitis C treatment dispensed were adjusted for multiple counting considering the duration of treatment for each regimen, and treatment compliance rate. For genotype-specific regimens, a distribution of 50% genotype 1 and 50% genotypes 2/3 was assumed. For estimates in 2013 and 2014, data from longitudinal tracking of a 10% random sample of PBS prescriptions were used.

Number of people who have ever achieved treatment-induced hepatitis C cure

The estimated number of people receiving hepatitis C treatment in each year was multiplied by the proportion with sustained virological response (SVR) reported in the literature (regimen-specific). Australian data on the proportion with SVR were prioritized, if available. A distribution of 50% genotype 1 and 50% genotypes 2/3 among people receiving hepatitis C treatment was assumed.

National surveillance for newly diagnosed HIV infection

HIV infection is a notifiable disease in each State/Territory health jurisdiction in Australia. All new HIV diagnoses are reported by doctors and laboratories to State/Territory health authorities. Information sought on the notification form includes; name code (based on the first two letters of the family name and the first two letters of the given name), sex, date of birth, post code, country of birth, Aboriginal and Torres Strait Islander status, date of HIV diagnosis, CD4+ cell count at diagnosis, source of exposure to HIV and evidence of newly acquired HIV infection (see below). If the person is born overseas, language spoken at home and date of arrival in Australia are also collected. These data are then forwarded to the Kirby Institute for collation and analysis. The database where HIV diagnoses are stored is referred to as the 'National HIV registry.'

Information on country of birth has been reported by all jurisdictions since 2002 and language spoken at home has been reported by New South Wales, Victoria and Queensland since 2004 and by all jurisdictions since 2008.

In New South Wales, information on cases of newly diagnosed HIV infection was sought only from the diagnosing doctor prior to 2008. From 2008, information was also sought from the doctors to whom the person with HIV infection was referred, and follow-up was carried out for cases for which the information sought at HIV notification was incomplete. These new procedures resulted in more complete information on new HIV diagnoses and reassignment of cases found to have been newly diagnosed in earlier years.

The procedures used for national HIV surveillance of newly diagnosed HIV infection are available at: http://kirby.unsw.edu.au/.

Newly acquired HIV infection

Newly acquired HIV infection is defined as newly diagnosed infection with evidence of a negative or indeterminate HIV antibody test or a diagnosis of primary HIV infection (seroconversion illness) within 12 months of HIV diagnosis. Information on the date of the last negative or indeterminate test or date of onset of primary HIV infection has been routinely sought from each State/Territory health jurisdiction since 1991.

Late and advanced HIV diagnosis

Advanced HIV diagnosis is defined as newly diagnosed HIV infection with a CD4+ cell count of less than 200 cells/μl, and late HIV diagnosis was defined as newly diagnosed HIV infection with a CD4+ cell count of less than 350 cells/μl.

Rates of HIV diagnosis

Notification rates were calculated using population denominators obtained from the ABS by state, year, sex and age (ABS series 3101051 – 3101058) and were standardised using ABS Standard Population Catalogue 3100DO003_201212. Population denominators by country/region of birth were based on the standard Australian Classification of Countries (ABS series 1269.0) with proportion of population by region of birth and year ascertained from ABS SuperTable data. Population denominators by year, sex, age and state for Aboriginal and Torres Strait Islanders were obtained from ABS catalogue 32380do001_2011. ABS regional population denominators by age, sex, indigenous status and state were obtained from ABS 2011 census data using remoteness according to postcode as assigned by ABS catalogue 1270055006_CG_POSTCODE_2012_RA_2011. The proportion of the population by remoteness was held constant over the range of data presented and used to evaluated remoteness populations by year using ABS population data matched by state, age, sex and Aboriginal and Torres Strait Islander status.

HIV diagnosis and care cascade

Estimating the number of people with diagnosed infection

The number of people living with diagnosed HIV infection (PLDHIV) was estimated using annual notifications, removal of duplicates, estimated mortality rates, and overseas migration rates.

HIV notifications data were provided from the National HIV registry. Potential duplicate records were removed using methods previously used by Nakhaee F, Black D, Wand et al.[92] The number of deaths up to 2003 was estimated based on results from a linkage study conducted between Australia's National Death Index and the National HIV Registry for cases to the end of 2003[92]. The number of deaths after 2003 was estimated using annual mortality rates from the Australian HIV Observational Database (AHOD).[93] Between 2004 and 2014, similar annual mortality rates were estimated for the AHOD cohort regardless of whether people were retained, lost or returned to follow up. We used the annual overall mortality rate from AHOD as the best estimate and the 95% confidence interval as a range in our calculations for the number of PLDHIV.

We estimated overall overseas migration rate for PLDHIV using data from the Australian Bureau of Statistics (ABS) data on the annual number of people in the overall population who permanently leave Australia (provided by the ABS series 340102) and the estimated resident population (ABS series 310104). Due to the requirement for ongoing care and treatment (which is not subsidised in many countries) we assumed a range in the annual overseas migration rate between zero and the overall rate of permanent departure with a best estimate in the middle.

The overall estimate of the number of PLDHIV in Australia each year was obtained by adding the number of unique notifications to the previous year's estimate and subtracting the number of deaths and permanent overseas migrants using the mortality and migration rates.

Estimating the number of people living with HIV

To estimate the overall number of people living with HIV (PLHIV), both diagnosed and undiagnosed, we used a back projection method to estimate the proportion of men who have sex with men (MSM) and non-MSM PLHIV who are undiagnosed [94].

A weighted average for the overall population of PLHIV who are undiagnosed was calculated by multiplying the proportion of MSM and non-MSM undiagnosed by the proportion of all diagnoses attributed to male homosexual contact and other exposure. The overall prevalence of HIV in Australia was then estimated by inflating the calculated number of people living with diagnosed infection by the estimated level of undiagnosed infection.

Estimating antiretroviral treatment coverage

The number of people receiving antiretroviral treatment (ART) was estimated using a 10% sample of the Pharmaceutical Benefits Scheme (PBS) patient level script claims data provided by the company Prospection. This is a randomised patient level, de-identified PBS script claims data set from 2006-present. Currently the data set has 170 million script claims and 3 million patients. It includes all PBS listed drugs with HIV indications. The overall total number of people receiving ART was taken as the number of unique patients in the PBS data set who filled in at least one script in the 12 months prior to the end of December 2014 multiplied by 10. Given the size of the sample we assumed a negligible range in this estimate.

Estimating levels of virological suppression

We define virological suppression as less than 400 viral copies per ml. The proportion of people on ART with viral suppression was taken to be the proportion of people recorded in the Australian HIV Observational Database (AHOD) who had less than 400 copies per ml at their last viral load test. Uncertainty bounds were taken to be the proportion of people recorded in AHOD who had less than 1000 copies per ml and 50 copies per ml at their last viral load test. We estimate the number of PLHIV on ART with viral suppression by multiplying this proportion and range by estimated the number of people receiving ART.

The Australian HIV Observational Database (AHOD)

The Australian HIV Observational Database (AHOD) is a collaborative study, recording observational data on the natural history of HIV infection and its treatment. The primary objective of AHOD is to monitor the pattern of antiretroviral treatment use by demographic factors and markers of HIV infection stage. Other objectives are to monitor how often people with HIV infection change antiretroviral treatments and the reasons for treatment change. Methodology associated with AHOD has been described in detail elsewhere.[95]

Information is collected from hospitals, general practitioner sites and sexual health centres throughout Australia. Participating sites contribute data biannually from established computerised patient management systems. Core variables from these patient management systems are transferred electronically to the Kirby Institute, where the data are collated and analysed. By March 2014, 31 participating clinical sites enrolled over 3 900 people into AHOD.

The Australian Needle and Syringe Program Survey

Briefly, the ANSPS is conducted annually over a 1 – 2 week in October at more than 50 needle and syringe programs (NSP) to provide serial point prevalence estimates of HIV and hepatitis C and to monitor injecting behaviour among people who inject drugs (PWID). All clients attending needle and syringe program (NSP) sites during one week in 2009 (51 sites), 2010 (53 sites), 2011 (53 sites), 2012 (52 sites) and 2013 (50 sites) were asked to complete a brief, self-administered questionnaire and to provide a finger prick blood spot sample for HIV and hepatitis C antibody testing. The ANSPS methodology has been described in detail elsewhere.[96]

Inferences derived from the Australian Needle and Syringe Program Survey can reasonably be extrapolated to the broader population of needle and syringe program attendees in Australia. However, while consistent with other sources of surveillance data, the extent to which the Survey results can be generalised to the broader Australian population of people who inject drugs cannot be ascertained.

The Australian and New Zealand Liver Transplant Registry (ANZLTR)

ANZLTR is a network of liver transplant centres in Australia and New Zealand which has collected information on the characteristics of people undergoing liver transplantation. People undergoing liver transplantation have been routinely tested for hepatitis B infection and for hepatitis C infection since antibody testing became available in 1990. Information was sought on the primary and secondary causes of liver disease including the results of tests for hepatitis B virus and hepatitis C virus. The information was forwarded to the Liver Transplant Registry located at Princess Alexandra Hospital in Brisbane. The number of liver transplants by primary cause of liver disease and hepatitis status where the primary diagnosis was hepatocellular carcinoma was obtained from the ANZLTR.

HIV Futures

HIV Futures is an anonymous survey of people living with HIV (PLHIV). It asks people about a range of issues including their health, treatments, work and financial situation. HIV Futures surveys have been conducted every two to three years since 1997, attracting responses from around 1000 PLHIV each time. The HIV Futures Study is conducted every 23 years and is a national crosssectional survey of people living with HIV. The HIV Futures 5 study was conducted in 2005 – 2006, HIV Futures 6 during 2008 – 2009, and HIV Futures 7 in 2011 – 2012. HIV Futures 7, the latest of these anonymous selfadministered surveys to be completed, sampled 1 058 people living with HIV infection in Australia.[65] The survey was carried out over 6 months from October 2011 to March 2012.

The Gay Community Periodic Survey (GCPS)

The Gay Community Periodic Surveys are conducted annually using time and location convenience samples of men at gay community venues and events in capital cities (Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra). The report is prepared Centre for Social Research in Health, UNSW Australia. The methodology associated with the Gay Community Periodic Surveys has been described in detail elsewhere.[97]

Medicare

Medicare is delivered by the Australian Government Department of Human Services and provides high quality national health programs and services. Publicly available Medicare online data on number of tests for *Chlamydia trachomatis* as identified by item numbers 69316, 69317 and 69319 were obtained by sex, age, state and quarter (http://medicarestatistics.humanservices.gov.au/statistics/mbs_item.jsp#info).

Publicly available Medicare data are only available in five year age groupings, meaning the data presented below are for 15 – 24 year olds and do not match the indicator specifications. From 2016, data by year of age will likely be available.

National Centre for Immunisation Research of Vaccine Preventable Diseases (NCIRS)

NCIRS' primary function is to perform research aimed at reducing the incidence of vaccine preventable diseases and improving vaccine uptake, in children and adults, including surveillance. Hepatitis B vaccine coverage was estimated using data from the NCIRS surveillance of immunisation coverage and the Australian Childhood Immunisation Register.

National Human Papillomavirus Vaccination Program Register (NHVPR)

The NHPVR was established in early 2008 to support the National HPV Vaccination Program, and is fully funded by the Australian Government. The NHVPR monitors and evaluates the HPV vaccination program through the registration of immunisation providers, the creation of individual consumer immunisation records, mailing of completion statements and reminder letters, and the generation of statistical reports on the National HPV Vaccination Program (http://www.hpvregister.org.au/). Percentage of HPV vaccine coverage in males and females turning 15 years of age was obtained from the NHVPR.

The National Survey of Australian Secondary Students and Sexual Health (SASSH)

The SASSH provides a picture of sexual attitudes, knowledge and experiences of young Australian people and has been carried out approximately every five years since 1992. The survey uses convenience sampling for school-based and online recruitment rather than random sampling, which may affect the generalizability of the results; however this method enables easier recruitment of participants to maintain adequate numbers of participants. The last survey was carried out in 2013, and involved more than 2 000 students in years 10, 11 and 12, at Government, Catholic and Independent schools.[36]

Registered births

The number of live births is sourced from the Australian Bureau of Statistics 3301.0 *Births, Australia*, 2014. Live birth refers to the number of births registered within each calendar year and excludes still births/foetal deaths. The National Perinatal Epidemiology and Statistics Unit of the Australian Institute of Health and Welfare (AIHW) also collects birth data from midwives and other health professionals who attend births. As information from these two collections are from different sources, the statistics obtained may vary. Differences in numbers reported may reflect processes of data collection, and that parent(s) delay or fail to register the birth of a child. For a full list of caveats refer to the explanatory notes of the ABS *Births Australia* releases (catalogue number 3301.0).

Sexual Health and Relationships in young Indigenous people study' (GOANNA)

The 'Sexual Health and Relationships in young Indigenous people study' (GOANNA) is the first national survey of young Aboriginal and Torres Strait Islander people in relation to STIs and BBVs undertaken in Australia. During 2011 – 2013, 2 877 Aboriginal and Torres Strait Islander people aged 16 – 29 years from every jurisdiction were surveyed and data were collected on participant demographics, STI and BBV risk knowledge, sexual behaviours and access to health services.[98] While studies of this nature can never claim to be truly representative of the total study population – in this case the total Aboriginal and Torres Strait Islander population aged 16–29 years – the study population includes a range of demographic characteristics, such as the ages within the study group aged 16–29 years, representation from urban, regional and remote areas and both heterosexual and homosexual identities similar to the broader population.. Within the sample, there was a modest over-representation of women in our study population, which is typical of a voluntary survey of this type. Despite representation from residents in urban, regional and remote areas, a lower proportion of remote community residents made up the study population relative to the proportion of Aboriginal and Torres Strait Islander people living in remote areas. Despite these limitations, the GOANNA study findings are currently the only source of data to measure this indicator.

Pharmdash

Data on dispensed prescriptions for a Pharmaceutical Benefits Scheme (PBS) 10% sample is updated every quarter and supplied to a number of approved users or clients including Prospection which provides a dashboard interface (Pharmdash) for querying the PBS 10% sample (see http://www.pbs.gov.au/info/industry/useful-resources/sources/). The 10% sample of the PBS is a randomised patient level, de-identified PBS script claims data set from 2006-present. Currently the data set has 170 million script claims and 3 million patients. It includes all PBS listed drugs with HIV indications.

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