Science for Communities

SEXUALLY TRANSMITTED INFECTIONS IN NEW ZEALAND

ANNUAL SURVEILLANCE REPORT 2016

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PREPARED BY:	Jill Sherwood, Ali Borman, Luke Scullion and Rebekah Gray Health Intelligence Team, Health and Environment Group Institute of Environmental Science and Research Limited
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SUMMARY

In New Zealand, at the time this surveillance data was collected, sexually transmitted infections (STIs,) with the exception of AIDS, were not notifiable. Surveillance efforts were based on the voluntary provision of data from sexual health clinics (SHCs), family planning clinics (FPCs) and laboratories. Population and disease surveillance therefore varies with the data source.

This report summarises the surveillance information for STIs in 2016 and examines trends over time. The following STIs are reported: chlamydia, gonorrhoea, genital herpes, genital warts, infectious syphilis, non-specific urethritis (NSU), chancroid, granuloma inguinale (GI) and lymphogranuloma venereum (LGV). The STI burden in New Zealand is considerable, with young people, those of non-European ethnicities and MSM over-represented.

CHLAMYDIA

- Chlamydial infection was the most commonly reported STI in New Zealand (30,552 cases)
- The national chlamydia rate was 651 cases per 100,000 population, a significant increase from 2015 (640 cases per 100,000)
- Between 2012 and 2016, test positivity decreased from 8.6% to 7.6%; during this period the number of specimens tested increased by 47%, with 80% of specimens in females
- Since 2012, Tairawhiti, Lakes and Hawkes Bay DHBs have consistently had the highest chlamydia rates
- There were more than twice the number of cases of chlamydia in females than in males
- The majority of cases (82%) were reported in the 15–29 years age group
- 61 laboratory-diagnosed cases of chlamydia were reported in the <1 year age group; 54 of these cases had the site of infection reported, with the site recoded as the eye for 50 cases
- In those aged 15–29 years the highest estimated chlamydia rates were reported in the Māori and Pacific peoples ethnic groups
- Testing rates across all age groups, were over three times higher in females than males, with the highest annual population testing rates reported in those aged 15–29 years.
- Māori females in the 20–24 years age group had the highest annual population testing rate across the ethnic groups (703 tests per 1000 population) but many of these were repeat tests with only 42.7% of this group receiving at least one test during 2015
- Annual testing coverage rates in the highest risk age groups suggest that <10% of males and 21–34% of females in these had at least one annual test
- 72% of cases were diagnosed outside of a sexual health or family planning clinic, most likely in primary care settings

Commentary: There was a small but significant increase in the national chlamydia rate in 2016 following relatively stable rates from 2013–2015. The much higher rate reported in females is probably due to far lower testing rates in males, suggesting many infections in males remain undiagnosed and untreated, highlighting the need for interventions to increase testing rates in males. Although there was an overall decrease from 2012–2016 in rates for females in the 15–19 and 20–24 years, and males in the 15–19 years, age groups, the highest risk age groups remain those aged 15–29 years. Despite a small increase in testing rates for these age groups, test positivity has remained stable since first reported in 2013. This suggests that the overall increase in incidence may be due to increased diagnosis rather than increasing prevalence. The persisting pattern of infection in babies highlights the need, noted in previous reports, to improve STI screening during pregnancy. Māori and Pacific peoples ethnic groups continue to show a higher burden of disease than other ethnic groups, with higher estimated incidence rates, and test positivity in the 15–29 years age groups compared with national rates. Testing and coverage rates for Māori females in these age groups, and for Pacific females in the 25–29 years age group, are higher than the national average. However, testing and coverage rates for Māori and Pacific males in these age groups are lower than the female rates but with much higher test positivity rates. This may be due to reduced access to healthcare services and under-diagnosis in the males and suggests that they may be a pool for re-infection within their social networks.

GONORRHOEA

- The national rate of gonorrhoea was 82 cases per 100,000 population, a significant increase from the 2015 rate of 75 cases per 100,000
- Between 2012 and 2016, test positivity increased slightly from 1.0% to 1.1% during which time the number of specimens tested increased by 21% with 79% of specimens from females
- Although the highest rate of gonorrhoea was reported in Tairawhiti DHB (211 cases per 100,000 population), this a small, although non-significant, decrease from the 2015 rate (229 per 100,000)
- 50.5% of laboratory-confirmed cases were diagnosed in the Auckland region (1953 cases) and the Auckland rate of 120 per 100,000 was a significant increase from 2015 (109 per 100,000)
- The national rate for males was higher than for females (98 and 66 per 100,000 respectively) with male rates higher than the female rates in all regions with large urban centres
- 69% (2672) of cases diagnosed were aged 15–29 years and four cases were aged <1 year
- In those aged 15–29 years the highest estimated gonorrhoea rates were predominantly reported in the Māori and Pacific peoples ethnic groups
- Estimated national rates for males were higher than female across all ethnicities apart from Māori, and this pattern was also seen in the high risk age groups apart from Pacific peoples and European/Other (15–19 years) ethnicities where female rates were higher than male
- Annual population testing rates across all age groups were more than three times higher for females compared with males, with the highest testing rates in the 15–34 years age group
- Annual testing coverage rates in the highest-risk age groups suggest that <10% of males and 22–35% of females in these age groups had at least one annual test.
- An increasing number of gonorrhoea cases were diagnosed via anorectal and throat specimens in males (>30% of positive tests), and in throat specimens in females
- Four *N. gonorrhoeae* isolates with decreased susceptibility to ceftriaxone were identified in 2016 in Waikato (2 cases) and Canterbury (2 cases) DHBs
- 63% of cases were diagnosed in primary care settings

Commentary There was a significant increase in the national gonorrhoea rate in 2016, largely driven by the increased rate in the Auckland region where the rate is higher for males compared with females. It is unclear whether this reflects a true increase in incidence or is due to increased testing and screening of infected people, particularly males who are now able to be tested on a urine sample rather than a urethral swab. As in recent years a higher rate in males was also reported in other regions with large urban centres (Wellington region, Waikato, Canterbury and Southern DHBs), all regions where there has been an increase in syphilis cases numbers among MSM. The increased proportion of positive tests diagnosed from throat and anorectal swabs suggests there may be increased testing and case finding in MSM. Despite the overall higher rates in males compared with females, the much lower testing and coverage rates in males compared with females suggests that many infections in males remain undiagnosed and untreated, highlighting the need for interventions to increase testing rates in males. There is a difference across ethnic groups with a higher gonorrhoea rate in Māori females, all age groups, and in younger females of Pacific peoples ethnicity, compared with males. These differing patterns among ethnicities and geographic settings suggest that a range of strategies are needed for control of gonorrhoea.

INFECTIOUS SYPHILIS

- 325 infectious syphilis cases were reported in 2016, an increase from 2015 (225 cases)
- The majority of cases were reported from the Auckland region (64.0%, 208 cases) and Canterbury DHB (7.7%, 25 cases)
- 90.2% of cases reported by SHCs and FPCs were male
- 321 cases were reported from SHCs; all these cases had enhanced surveillance data provided:
  - 290 cases were male, 6 transgender and 25 female
  - Highest number of cases in males were in the 20–24, 25–29, 30–35 and 35–39 years age groups; the increasing trend across all age groups for males since 2012 is most notable in those aged 25–29 years
  - Of the 290 cases in males, 81.7% (237/290) were reported to be MSM (21 of these bisexual)
  - 24% of cases were reported to be heterosexual, an increase from the 21% reported in 2015
  - 45.6% of MSM cases reported New Zealand European ethnicity, a decrease from 2015 (57.1%). There was a corresponding increase in the proportion of other ethnic groups: Other (18.0%), followed by Asian and Māori (both 15.9%)
  - The most common country of infection was reported to be New Zealand
  - The most common primary reason for testing for both MSM and heterosexuals was clinical symptoms or suspicion, a similar finding to the previous five years
  - 24.2% of MSM cases had a concurrent STI diagnosis, most commonly chlamydia, and 26.8% were HIV seropositive

Commentary: Infectious syphilis in New Zealand continues to be most commonly reported as an infection in MSM with the majority of cases concentrated in areas with large urban populations. However, the increased proportion of cases reported since 2015 that were heterosexual is of concern, as is the changing pattern of ethnicity among cases. Both suggest wider transmission, possibly into groups that have not been seen as high risk and may therefore not be offered asymptomatic screening. The low numbers of cases initially tested as “screening”, especially for females, supports this concern. Strategies to increase awareness amongst clinicians that the recent increase in infectious syphilis was not confined to MSM and promotion of the New Zealand Sexual Health Society STI Guidelines would be useful to address these concerns. Almost a quarter of cases in MSM also had a concurrent STI diagnosis highlighting the importance of comprehensive STI testing, as recommended in the Guidelines.

GENITAL HERPES

- In 2016, 1035 first presentations of genital herpes were reported; 739 cases were seen in SHCs and 296 cases in FPCs, a decrease in cases in SHCs from 2016 but an increase in FPCs
- Nationally case numbers have decreased in SHCs but shown a small increase in FPCs from 2012 to 2016 but there is variation across DHBs for the trend data for SHCs with an increasing trend seen in several DHBs, most notably Canterbury DHB
- More cases were reported in females than males across both clinic types
- Since 2012 a decrease has occurred in case numbers reported by SHCs in females aged 15–19, 20–24 and 30–34 years but an increase in females in the 25–29 years age group. Case numbers reported for males in SHCs show a decreasing trend in all age groups. This compares with generally stable numbers in males reported by FPCs (note very low numbers), apart from an increase in the 25–29 years age group, and an increasing trend in females reported by FPCs across all age groups between 15 and 34 years.
- 40.2% of cases reported from SHCs were aged <25 years and 59.1% of cases reported from FPCs were aged <25 years
- The majority of cases reported by both SHCs and FPCs were of European ethnicity (74.4% and 79.0% respectively)

Commentary: Although case numbers of genital herpes have shown a decreasing trend over the past five years this must be interpreted with caution as surveillance is sentinel clinic-based and thus rates are not able to be calculated. Differing patterns between years and clinic types may reflect changes in clinic attendance rather than changes in incidence.

GENITAL WARTS

- 1399 first presentations of genital warts were reported in 2016. Of these, 1201 were seen in SHCs
- From 2015 to 2016 case numbers decreased in SHCs by 20.1% and increased in FPCs by 5.3%
- More cases were reported in males in SHCs and in females in FPCs across both clinic types
- Between 2012–2016 case numbers have decreased in all age groups in SHCs and in those aged <25 years in FPCs
- Decreases in case numbers of >50% were seen in the 15–19 years age group for both clinic types and in the 20–24 years age groups for SHCs from 2012–2016
- Case numbers reported from both clinic types decreased or remained stable in the European, Māori and Pacific peoples ethnic groups from 2012 to 2016

Commentary: The decreasing trend in the number of cases of genital warts reported from both clinic types continued in 2016 and remains most notable in both females and males aged 15–24 years. These decreases follow the introduction of HPV vaccine onto the routine immunisation schedule for girls aged 12 years from late 2008, along with a catch up programme targeting girls born on or after 1 January 1990 [1].The decline in genital warts in the clinic data is consistent with findings from Australia [2].

OTHER STIs

- 649 cases of NSU were reported in 2015, the majority in SHCs (623 cases)
- 27.8% of cases in SHCs were aged <25 years
- The number of NSU cases reported by SHCs decreased by 4.4% between 2012 to 2016, whereas case counts increased in FPCs but remained low (26 cases in 2016)
- No cases of lymphogranuloma venereum (LGV), chancroid or granuloma inguinale (GI) were reported in 2016

Commentary: The increasing national trend in NSU cases noted in the 2015 report that was driven by increasing case numbers in Auckland and Wellington regions and Canterbury DHB has not persisted. This contrasts with the ongoing trend of increasing gonorrhoea and infectious syphilis cases in those areas.

INTRODUCTION

ABOUT THIS REPORT

The *Sexually transmitted infections in New Zealand: Annual Surveillance Report* summarises the epidemiology of STIs in 2016, and examines trends since 1998.

Surveillance data are presented by disease rather than by reporting source. For chlamydia and gonorrhoea, laboratory and clinic surveillance provide complementary information and together present an informative picture of the epidemiology of these infections in New Zealand. Genital herpes, genital warts, syphilis, NSU, chancroid, GI and LGV surveillance continue to be solely clinic based.

Laboratory surveillance now covers all 20 DHBs in the country for both chlamydia and gonorrhoea. STI laboratory data is collected via a secure SharePoint portal website, and use of the National Health Index (NHI) number allows retrieval of ethnicity information from the Ministry of Health. Test positivity and population testing rates for chlamydia and gonorrhoea by age and sex have been included in the report since 2013, and by ethnicity since 2014.

The clinic surveillance data reported this year, as for 2012–2015, is restricted to data from sexual health and family planning clinics (SHCs and FPCs). This report also incorporates data from enhanced syphilis surveillance, a project piloted by the AIDS Epidemiology Group (AEG) in 2011. This data is collected from SHCs (by AEG for 2011 and 2012, and by ESR from 2013).

Gonococcal antimicrobial susceptibility testing data has been received directly by ESR from the laboratories since 2013, and collated to provide national estimates of antibiotic resistance.

At the time this surveillance data was collected no STIs were notifiable, with the exception of AIDS, and the surveillance system relies on the ongoing support of clinic and laboratory staff. Our thanks go to all the clinics and diagnostic laboratories that contribute regularly to STI surveillance.

This report is available electronically at http://www.surv.esr.cri.nz/surveillance/annual_sti.php. A set of slides containing selected figures from this year's report is also available from the website.

SURVEILLANCE METHODS

INTERPRETING THE RESULTS

Diagnostic test changes

Nucleic acid amplification tests (NAAT) have been the standard method for testing for chlamydia in New Zealand for many years. However, the longest chlamydia trends, from 1998 onwards, will show influence from the introduction of NAAT testing.

The diagnostic tests used for gonorrhoea were not standardised across New Zealand laboratories until recently (Table 1). Most laboratories have now introduced NAAT in place of, or in addition to, culture.

NAAT and culture have different sensitivities and specificities that may influence the data. Most notably, increases in DHB gonorrhoea rates are evident in the surveillance data after the main or sole DHB testing laboratory changed to using predominantly NAAT.

Table 1. NAAT testing for gonorrhoea in laboratories

Laboratory[a]	DHB	NAAT testing	Year introduced
Northland Pathology	Northland	Yes	2012
Whangarei Hospital	Northland	No	-
North Shore Hospital	Waitemata	Yes	2012
LabPLUS	Auckland	Yes	2011
Labtests	Waitemata, Auckland, Counties Manukau	Yes	2012
Middlemore Hospital	Counties Manukau	Yes	2013
Waikato Hospital	Waikato	Yes	2013
Pathlab	Waikato, Lakes, Bay of Plenty	Yes	2013
Southern Community Laboratories	Waikato, Lakes, Hawke's Bay, Nelson Marlborough, Canterbury, South Canterbury, Southern	Yes	Since 2011
Medlab Central[b]	Tairawhiti, Whanganui, MidCentral and Wairarapa	Yes	2012–2014
Taranaki Base Hospital[c]	Taranaki	No	-
Taranaki Medlab	Taranaki	No	-
Hutt Valley Hospital	Hutt Valley	Yes	2010
Aotea Pathology	Capital & Coast	Yes	2012
Canterbury Health Lab	Canterbury, West Coast	Yes	2009

[a] Some laboratories or hospitals have their testing carried out via other laboratories therefore this is not a complete list of all laboratories as shown in Appendix C.

[b] Only Tairawhiti has performed NAAT testing since 2012 and other areas introduced NAAT in 2014.

[c] Taranaki Base Hospital only performs cultures but has NAAT tests performed by Canterbury Health Labs.

Generalisability of clinic data

Clinics participating in STI surveillance are located in cities and some larger rural towns. Most other rural towns and isolated populations have limited or no access to the services offered by SHCs and FPCs, and rely on other health care providers. While STIs are diagnosed and treated by a range of primary healthcare providers, including general practitioners (GPs), the data from SHCs and FPCs can provide an alert for changes occurring in the wider population.

Comparison with previous years

From 2012 to 2016, the number of clinic data sources has been relatively stable. However, not all of the participating clinics are always able to provide data for all months of the year. Clinic data is included if a clinic met the 10 out of 12 months inclusion criteria. Although caution is advised, year-on-year comparisons for this period are reasonably valid.

For the laboratory data trend analyses, DHBs were only included in the reporting if their data were considered complete according to a series of selection criteria (see Analytical methods). The New Zealand rates reported from 2012 to 2016 were calculated using a set of DHBs who had complete data for 2010 to 2012 and all DHBs (except Northland for gonorrhoea) from 2013–2014. In 2015, all DHBs provided data for both chlamydia and gonorrhoea for the first time. New data processing methods were introduced in 2013. Year-on-year comparisons using the laboratory data are reasonably valid, although caution is advised and the influence of gonococcal NAAT testing introduced during this time period must be considered.

STI SURVEILLANCE IN NEW ZEALAND

Purpose of STI surveillance

Surveillance is the on-going systematic collection, analysis and interpretation of outcome-specific data for use in the planning, implementation and evaluation of public health practice [3]. Surveillance is an important part of the strategy to reduce the short and long term burden of sexually transmitted infections [4]. New Zealand's STI surveillance system has five identified purposes [5]:

- to understand the burden of disease (as an input to planning, policy development, prioritisation and resource allocation),
- to monitor inequalities in the burden of disease between population groups,
- to monitor trends in the burden of disease over time,
- to identify emerging problems, and outbreaks or clusters of disease,
- to evaluate the effectiveness of policies and programmes.

Laboratory-based surveillance

The number of cases of STIs reported through the clinic-based surveillance system underestimates the true burden of disease in New Zealand because a substantial percentage of STIs are diagnosed by other health care providers, particularly primary health care practitioners. Laboratories receive specimens from all health providers, and so provide a very useful source of data for those STIs where all or most diagnoses rely on a positive laboratory test.

Laboratory-based surveillance of gonorrhoea and chlamydia began in the Waikato and Bay of Plenty regions in 1998, the Auckland region in 1998 (gonorrhoea) and 2001 (chlamydia), and gradually extended to all diagnostic laboratories across New Zealand starting in 2004.

Improvements to the reporting of laboratory surveillance data were implemented during 2009. These improvements have enabled the reporting of population-based rates of chlamydia and gonorrhoea for many DHBs and estimates of national rates based on the data from these DHBs. 2013 was the first year in which all DHBs (except Northland for gonorrhoea) provided STI surveillance data for a full year. 2015 was the first year in which all DHBs provided data for a full year for both chlamydia and gonorrhoea (see Appendix D: 2016 participation maps).

Since 2013, ESR has worked with laboratories on further measures to enhance the surveillance of STIs. This extended surveillance to all specimens tested for most laboratories, enabling testing and positivity rates in different population groups to be analysed. ESR also collected NHIs for all laboratory test results, allowing the ethnicity of those having STI tests to be determined. Analysis of this ethnicity data is presented in this report.

Clinic-based surveillance

Sexual health clinics (SHCs) have participated in STI surveillance since 1988, with ESR taking a national co-ordinating role from 1995. Initially SHCs reported the number of cases seen with the following diseases: syphilis, gonorrhoea, chlamydia, warts (1st attack), herpes (1st attack), trichomoniasis, chancroid, lymphogranuloma venereum (LGV) and granuloma inguinale (GI). SHCs also reported the number of new clinic patients (patients who had not visited a clinic in the past three months) and used this to calculate a clinic-based disease rate. Demographic information for cases (age, sex and ethnicity) has been reported since 1996.

Clinic-based surveillance progressed markedly in 1998. The Ministry of Health contracted ESR to implement the expansion of the STI surveillance system. Data collection from family planning clinics (FPCs) and student and youth health clinics (SYHCs) was added to provide a more comprehensive picture of the STI disease burden in New Zealand. An expert committee was convened to advise on

the implementation process. During this time the current case definitions were adopted; trichomoniasis was removed from the list of reported STIs; non-specific urethritis (NSU, males only) was added; and the site of infection began to be specified for cases of chlamydia and gonorrhoea. Denominator data was standardised – all clinics were requested to provide the total number of clinic visits per month, by age, sex and ethnicity. This allowed clinic-specific disease rates to be calculated, though visits could be for any reason, including non-sexual health consultations.

In 2010, the Ministry of Health, the New Zealand Sexual Health Society (NZSHS) and ESR collaborated with other stakeholders to identify priorities for addressing gaps in the current approach to STI surveillance. This led to changes in both clinic- and laboratory-based STI surveillance. Most immediate was the change to how data is reported in the annual and quarterly reports. For clinic-based surveillance, this included stopping the practice of calculating clinic disease rates using visit data as the denominator. Visit data are now provided separately to disease count data (see Appendix A).

Surveillance via SYHCs was discontinued in 2012 as it was recognised this data did not add to the information now provided by the other clinics and laboratories.

Enhanced syphilis surveillance

Historically, surveillance of syphilis in New Zealand has been part of the STI sentinel system, using data provided on a voluntary basis by SHCs, FPCs and SYHCs to ESR. In this surveillance almost all reported cases each year are from SHCs [6]. This sentinel system does not collect information on sexual behaviour or other possible risk factors.

Between 2002 and 2006 several studies from different areas in New Zealand showed an increased risk of disease in MSM and the NZSHS decided a pilot project for national enhanced syphilis surveillance using data from SHCs was needed [7-10]. Subsequently the AIDS Epidemiology Group (AEG) in Dunedin offered to undertake this project and published a report in 2011 [7]. Data was also collected by the AEG in 2012 but a full report was not published. However a cluster of syphilis cases among young MSM in Christchurch was recognised and reported [11].

In 2013 the Ministry of Health asked ESR to take over the reporting of enhanced syphilis surveillance. Decisions on the data collected by ESR are guided by a steering group of NZSHS representatives. In addition to the usual demographic data of age, sex and ethnicity, information on sexual behaviour and a range of other risk factors is collected. Enhanced syphilis surveillance analyses in this report draw on data collected by AEG for 2011 and 2012 and by ESR from 2013.

DATA COLLECTION

Laboratories

The participating laboratories (see Appendix C) previously reported anonymised data on laboratory-confirmed cases of chlamydia and gonorrhoea, by age and sex, as well as the total number of specimens and/or patients tested. The diagnostic tests used by each laboratory may differ. The implementation of improved STI data collection via a SharePoint portal website has allowed laboratories to provide more detailed data in a secure way. Each month, laboratories upload their data to the Sharepoint portal website. Laboratory data are processed and collated into a database by ESR staff.

Data provided includes National Health Index (NHI) numbers, which are stored on the Sharepoint portal website. NHI numbers are used to retrieve Level 2 ethnicity information from the Ministry of Health, to update date of birth and sex where data is missing and to assign a unique identifier before deleting the NHIs from the Sharepoint portal.

Prior to 2013 it was not possible to determine the total number of positive individuals and specimens. Attempts had been made to remove duplicates from the data where one patient may have had multiple positive specimens. If this was not possible, it was assumed that each laboratory-confirmed specimen was equivalent to one laboratory-confirmed patient. As it is possible for one patient to have more than one positive specimen taken for the one STI episode, the true incidence may be less than that reported for years 2009–2012. Use of unique identifiers since January 2013 has allowed for the exclusion of repeat tests for an individual within a defined episode period (as outlined in Table 2).

In previous years, data on ceftriaxone, ciprofloxacin, penicillin and tetracycline resistance among *N. gonorrhoeae* isolates were collected annually from community and hospital diagnostic microbiology laboratories, and collated at ESR to provide national estimates of resistance to these four antibiotics. Since 2013, laboratories uploading data to the Sharepoint portal website have also included this data where the testing has been carried out and is available. LabPLUS (from the Auckland region) did not provide data in the new format for a full year in 2013, and Medlab Taranaki has not yet provided data in the new format.

Table 2. Episode periods

Disease		Episode period
Chlamydia		< 6 weeks after a previous positive test
Gonorrhoea	Culture	< 10 days after previous positive test (it does not matter if previous positive test was a NAAT or culture)
	NAAT	< 3 weeks after the previous positive test (it does not matter if previous positive test was a NAAT or culture)

Clinics

Clinics record anonymised data on the age, sex and ethnicity (Māori, Pacific peoples, European, Other, or Unknown) for all individuals meeting one or more of the STI surveillance case definitions (see Appendix B). Each month, clinics send the demographic data relating to their cases and the total number of clinic visits either directly to ESR or to a regional co-ordinator. Data is either entered directly into the national STI surveillance database by ESR staff or entered into a regional STI surveillance database by a regional co-ordinator. Data from regional STI surveillance databases is sent electronically to ESR each month where it is merged with data on the national STI surveillance database.

As noted in "Surveillance in New Zealand" the list of STIs under clinic-based surveillance and the case definitions for these infections has varied over time. The infections currently under surveillance are listed in Table 3.

For the enhanced syphilis surveillance, all SHCs are asked to complete a questionnaire for each case of infectious syphilis. The original questionnaire (2011) was updated in 2013 (see Appendices E and F for questionnaires). Cases include those initially diagnosed in other settings and referred to SHCs for management. The case data provided is anonymised by use of an AIDS code or SHC patient ID code. The codes are used to check for duplication.

Table 3. STIs under clinic-based surveillance

Infection	Category or criteria	Site (for confirmed infections)
Chlamydia	Confirmed or probable (1st diagnosis per month)	Uncomplicated lower anogenital, PID/epididymitis, other site
Gonorrhoea	Confirmed or probable (1st diagnosis per month)	Uncomplicated urogenital or anorectal, PID/epididymitis, pharynx, other site
Genital warts	1st diagnosis at reporting clinic	
Genital herpes	1st diagnosis at reporting clinic	
Infectious syphilis	Primary, secondary or early latent	
Non-specific urethritis	Males only	
Chancroid	Confirmed or probable	
Granuloma inguinale	Confirmed or probable	
Lymphogranuloma venereum	Confirmed or probable	

ANALYTICAL METHODS

All results and analyses are based on data submitted prior to 30 May 2017 except for the enhanced syphilis surveillance analysis (see Enhanced syphilis surveillance analytical methods). Any data submitted after this date will be reflected in subsequent annual reports.

STI surveillance data from the above-mentioned sources are stored in separate clinic and laboratory databases. Any identifiable information is removed or encrypted before this storage occurs. The data are extracted and analysed using Microsoft Access, SQL, Excel and R [12].

STI case numbers

While, in clinic-based surveillance, data is collected on both probable and confirmed cases for chlamydia, gonorrhoea, chancroid, GI and LGV, case numbers presented in this report relate to confirmed cases of these diseases only. Clinic trends are presented using case numbers.

STI rates

Rates have been generated for laboratory-based STI surveillance data. In previous years (before 2011) clinic-based disease rates were also calculated using the total number of clinic visits as the denominator.

Calculation of rates

Rates have not been calculated where there were fewer than five cases in any category. Calculating rates from fewer than five cases produces rates that are unstable for the purpose of comparison. Care should also be exercised when interpreting and comparing rates based on fewer than 20 cases.

Readers are also advised to consider the absolute number of cases in the categories analysed by rate because categories with the highest rates may sometimes involve a relatively small proportion of the overall disease burden.

Numerator data

Laboratory rates: the total number of laboratory-confirmed cases reported after exclusion of repeat tests for an individual within a defined episode period (Table 2).

Testing rates: the total number of tests for chlamydia and gonorrhoea.

Testing coverage rates (people tested): the number of people tested based on NHI and patient ID numbers, and using the age and location of the individual at the time of the first test of the year. These rates do not include multiple tests within the year for the same individual.

Test positivity: the total number of positive tests including positive repeat tests.

Ethnicity analysis of laboratory data: is based on all DHBs that provided data in the new format. Where an NHI number was not provided or could not be linked to a record the ethnicity was included in the Unknown group.

Denominator data

Laboratory and testing rates: the denominator for the calculation of rates is the 2016 mid-year population estimates published by Statistics New Zealand.

Test positivity: the total number of specimens tested including all repeat tests.

Ethnicity analysis of laboratory data: the denominator data is based on the proportion of people in each ethnic group from the 2013 Census ‘usually resident population’ applied to the 2016 mid-year

population estimates from Statistics New Zealand. Ethnicity is prioritised in the following order: Māori, Pacific peoples, Asian, Middle Eastern/Latin American/African (MELAA), European or Other (including New Zealander) ethnic groups.

Statistical tests

The method used to calculate the confidence intervals for the estimated national rates in the five-year trend analyses adjusts for the fact that we had laboratory data from most, but not all DHBs prior to 2015 [13]. The method also takes into account clustering within DHBs, in other words there are DHB-level factors such as reporting, use of diagnostic tests and opportunities for surveillance that will impact on the data.

Trends

As clinic and laboratory participation vary over time, reporting periods have been selected to provide the longest period of time for a relatively stable set of laboratories or clinics.

A five-year period (2012–2016) has been reported for laboratory surveillance trends and clinic trends, except for the long term trend analyses (limited to three regions) where a 19-year period (1998–2016) has been reported.

DHB reporting criteria: laboratories

For a DHB to be included in the analyses, all laboratories servicing that DHB must have participated in the surveillance programme (unless the non-participating laboratory was a hospital laboratory undertaking a small proportion of the DHB's STI testing).

1. In addition, the following participation criteria had to be met for each analysis type:
2. 2016 analysis: each laboratory in the DHB must have provided data for all 12 months of 2016. Age group and sex analysis for test positivity as well as all ethnicity analyses excluded Taranaki DHB as their data was not collected in the new format.
3. Trend analyses (national, age and sex, and test positivity): from 2011 to 2012 analyses are based on data from 15 DHBs. From 2013 to 2014 analyses are based on data from all DHBs for chlamydia and all DHBs except Northland for gonorrhoea. 2013 data was estimated for three quarters for LabPLUS in the Auckland region as data was only provided in the new format for the last quarter of the year (October to December 2013). The estimation was carried out by multiplying the quarter provided by three. In 2016 all DHBs were included in the analyses for both chlamydia and gonorrhoea.
4. Individual DHB trend analysis: for a DHB to be included in this analysis, all laboratories in the selected DHB must have provided data for the 12 months of each year for at least three of the last five years.
5. Specimen site analysis (in addition to the above criteria): laboratories with greater than 15% of specimen sites recorded as unknown were excluded from the analysis.

The following DHBs have been combined for reporting purposes: Auckland, Waitemata and Counties Manukau DHBs (Labtests), and Hutt Valley and Capital & Coast DHBs (Aotea Pathology). Table 4 summarises which DHBs met the inclusion criteria for the various analyses.

Table 4. Selected/excluded DHBs by analysis type and STI, 2016

District Health Board	Annual analysis 2016		Trend analysis 2012 – 2016		Individual DHB trend analysis	
	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea
Northland	✓	✓	✓	✓[c]	✓	✓[c]
Auckland region[a]	✓	✓	✓	✓	✓	✓
Waikato	✓	✓	✓	✓	✓	✓
Lakes	✓	✓	✓	✓	✓	✓
Bay of Plenty	✓	✓	✓	✓	✓	✓
Tairawhiti	✓	✓	✓	✓	✓	✓
Taranaki	✓	✓	✓	✓	✓	✓
Hawke's Bay	✓	✓	✓	✓	✓	✓
Whanganui	✓	✓	✓	✓	✓	✓
MidCentral	✓	✓	✓	✓	✓	✓
Wellington region[b]	✓	✓	✓[d]	✓	✓	✓
Wairarapa	✓	✓	✓	✓	✓	✓
Nelson Marlborough	✓	✓	✓[d]	✓[d]	✓	✓
West Coast	✓	✓	✓	✓	✓	✓
Canterbury	✓	✓	✓[d]	✓[d]	✓	✓
South Canterbury	✓	✓	✓[d]	✓[d]	✓	✓
Southern	✓	✓	✓	✓	✓	✓

[a] Waitemata, Auckland and Counties Manukau DHBs.
[b] Hutt Valley and Capital & Coast DHBs.
[c] Data incomplete in 2013 and 2014.
[d] Data not available 2011-2012.
✓ = Selected ✕ = Excluded

DHB reporting criteria: clinics

For a DHB to be included in the analyses, all clinics must have provided complete data to ESR for at least 10 out of the 12 months.

Enhanced syphilis surveillance analytical methods

All analyses are based on data submitted prior to 14 July 2017. Any data submitted after this date will be reflected in subsequent annual reports. Data received via email, fax, or post from SHCs are entered via a secure, web-based application called REDCap [14] and are extracted and analysed using Excel. Cases that are diagnosed and followed up by other health care providers are not captured in this report. All SHCs participated in 2016, and all syphilis cases from 2013–2016 were able to be matched and reconciled with syphilis cases reported as part of ESR's sentinel STI surveillance. Readers are advised that syphilis data from 2012 were not reconciled and accordingly the data in the enhanced syphilis surveillance vary from the clinic surveillance for this year.

Basic demographic information such as age or place of diagnosis is reported by sex. Other data presented in this report are categorised by sexual behaviour - men who have sex with men (MSM), females who have sex with males and females (FSMF) and heterosexual.

QUALITY OF SURVEILLANCE DATA

Laboratory participation

In 2016, 42 laboratories across all DHBs in New Zealand voluntarily participated in the STI surveillance programme. As laboratories began supplying data at different times and some gaps in data supply occurred, rates of chlamydia and gonorrhoea for each analysis type were calculated using data from laboratories that met specific selection criteria (see Analytical methods).

Ethnicity data completeness in laboratory surveillance

The level of completeness of ethnicity data is dependent on whether an NHI number is provided at the time of testing. The level of completeness by DHB for chlamydia and gonorrhoea is shown in Table 5 and Table 6 respectively. Interpretation of the ethnicity analyses should consider the varying levels of data completeness.

Clinic participation

In 2016, 27 SHCs and 32 FPCs across New Zealand voluntarily participated in the STI surveillance programme. Ninety-five percent (19/20) of DHBs contributed to clinic data. Wairarapa is the only DHB that does not provide clinic data due to not having either a SHC or a FPC. Tairawhiti DHB only provides SHC data for chlamydia and gonorrhoea. All clinics provided complete data to ESR for at least 10 of the last 12 months (the required number of months to be included in the analysis). FPCs included some clinics based in schools or tertiary institutions that may have been closed during holiday periods. All SHCs participated in the enhanced surveillance of infectious syphilis.

Table 5. Chlamydia laboratory ethnicity data completeness by DHB, 2016

DHB	Tests without NHI (%)	Positive tests without NHI (%)
Northland	16.1	24.1
Auckland region[a]	2.1	2.6
Waikato	9.4	13.8
Lakes	13.2	18.1
Bay of Plenty	25.2	35.1
Tairawhiti	20.0	22.9
Taranaki	-	-
Hawke's Bay	0.3	0.3
Whanganui	3.6	3.6
MidCentral	10.4	13.2
Wellington region[b]	9.1	8.5
Wairarapa	1.0	1.0
Nelson Marlborough	3.2	4.1
West Coast	21.0	35.5
Canterbury	7.2	6.8
South Canterbury	6.7	11.9
Southern	4.3	7.4
Total[c]	**6.6**	**8.8**

[a] Waitemata, Auckland and Counties Manukau DHBs.
[b] Hutt Valley and Capital & Coast DHBs.
[c] Excludes Taranaki DHB.

Table 6. Gonorrhoea laboratory ethnicity data completeness by DHB, 2016

DHB	Tests without NHI (%)	Positive tests without NHI (%)
Northland	20.3	35.7
Auckland region[a]	1.9	2.1
Waikato	9.5	24.5
Lakes	13.3	36.1
Bay of Plenty	25.3	37.4
Tairawhiti	19.8	17.6
Taranaki	-	-
Hawke's Bay	0.3	0.4
Whanganui	5.0	3.3
MidCentral	10.3	35.4
Wellington region[b]	9.0	22.8
Wairarapa	0.9	0.0
Nelson Marlborough	3.2	7.5
West Coast	21.0	66.7
Canterbury	6.4	11.7
South Canterbury	5.9	25.0
Southern	4.3	22.5
Total[c]	**6.5**	**11.8**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

[c] Excludes Taranaki DHB.

CHLAMYDIA

Chlamydia infection is asymptomatic in approximately 25% of male cases and 70% of female cases [15]. Untreated infection can lead to the development of serious sequelae, including pelvic inflammatory disease (PID), ectopic pregnancy and infertility in females and urethritis, epididymo-orchitis, reactive arthritis and infertility in males. Infants born vaginally to infected mothers can be infected during delivery resulting in neonatal conjunctivitis or pneumonia [16].

KEY FINDINGS: 2016

- Chlamydial infection was the most commonly reported STI in New Zealand (30,552 cases)
- The national chlamydia rate was 651 cases per 100,000 population, a significant increase from 2015 (640 cases per 100,000)
- Between 2012 and 2016, test positivity decreased from 8.6% to 7.6%; during this period the number of specimens tested increased by 47%, with 80% of specimens in females
- Since 2012, Tairawhiti, Lakes and Hawkes Bay DHBs have consistently had the highest chlamydia rates
- There were more than twice the number of cases of chlamydia in females than in males
- The majority of cases (82%) were reported in the 15–29 years age group
- 61 laboratory-diagnosed cases of chlamydia were reported in the <1 year age group; 54 of these cases had the site of infection reported, with the site recoded as the eye for 50 cases
- In those aged 15–29 years the highest estimated chlamydia rates were reported in the Māori and Pacific peoples ethnic groups
- Testing rates across all age groups, were over three times higher in females than males, with the highest annual population testing rates reported in those aged 15–29 years.
- Māori females in the 20–24 years age group had the highest annual population testing rate across the ethnic groups (703 tests per 1000 population) but many of these were repeat tests with only 42.7% of this group receiving at least one test during 2015
- Annual testing coverage rates in the highest risk age groups suggest that <10% of males and 21–34% of females in these had at least one annual test
- 72% of cases were diagnosed outside of a sexual health or family planning clinic, most likely in primary care settings

COMMENTARY

There was a small but significant increase in the national chlamydia rate in 2016 following relatively stable rates from 2013–2015. The much higher rate reported in females is probably due to far lower testing rates in males, suggesting many infections in males remain undiagnosed and untreated, highlighting the need for interventions to increase testing rates in males. Although there was an overall decrease from 2012–2016 in rates for females in the 15–19 and 20–24 years, and males in the 15–19 years, age groups, the highest risk age groups remain those aged 15–29 years. Despite a small increase in testing rates for these age groups, test positivity has remained stable since first reported in 2013. This suggests that the overall increase in incidence may be due to increased diagnosis rather than increasing prevalence. The persisting pattern of infection in babies highlights the need, noted in previous reports, to improve STI screening during pregnancy. Māori and Pacific peoples ethnic groups continue to show a higher burden of disease than other ethnic groups, with higher estimated incidence rates, and test positivity in the 15–29 years age groups compared with national rates. Testing and coverage rates for Māori females in these age groups, and for Pacific females in the 25–29 years age group, are higher than the national average. However, testing and coverage rates for Māori and Pacific males in these age groups are lower than the female rates but with much higher test positivity rates. This may be due to reduced access to healthcare services and under-diagnosis in the males and suggests that they may be a pool for re-infection within their social networks.

LABORATORY SURVEILLANCE OF CHLAMYDIA

NATIONAL AND DHB ANALYSIS

Annual 2016 analysis

In 2016 there were 30,552 laboratory-confirmed cases of chlamydia. The national chlamydia rate was 651 cases per 100,000 population, a significant increase from the 2015 national rate of 640 per 100,000. Case numbers and population rates for each DHB for the past two years are shown in Table 7.

Table 7. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB, 2015–2016

DHB	Number of laboratory-confirmed cases		Rate per 100,000 population		Rate change[c,d]
	2015	2016	2015	2016	
Northland	1221	1272	726	743	↑
Auckland region[a]	9917	10484	625	643	🡅
Waikato	2785	2568	713	643	🡇
Lakes	1100	1159	1049	1089	↑
Bay of Plenty	1600	1433	722	632	🡇
Tairawhiti	544	602	1152	1256	↑
Taranaki	542	524	467	449	↓
Hawke's Bay	1520	1504	950	931	↓
Whanganui	395	391	631	620	↓
MidCentral	1111	1127	646	646	↑
Wellington region[b]	2653	3156	596	697	🡅
Wairarapa	211	193	489	443	↓
Nelson Marlborough	660	580	456	397	🡇
West Coast	130	134	400	412	↑
Canterbury	2747	2926	522	543	↑
South Canterbury	219	197	374	333	↓
Southern	2049	2302	653	722	🡅
Total	**29,404**	**30,552**	**640**	**651**	🡅

[a] Waitemata, Auckland and Counties Manukau DHBs

[b] Hutt Valley and Capital & Coast DHBs.

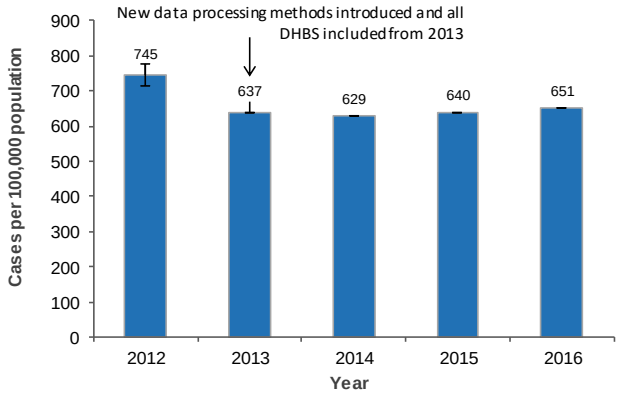
[c] 🡇 = significant decrease, 🡅 = significant increase, NC = no change, ↓ = not significant decrease, ↑ = not significant increase.

[d] Fisher's exact tests were used to determine statistical significance. Results are considered statistically significant when the P value is less than or equal to 0.05.

Trends in laboratory diagnoses

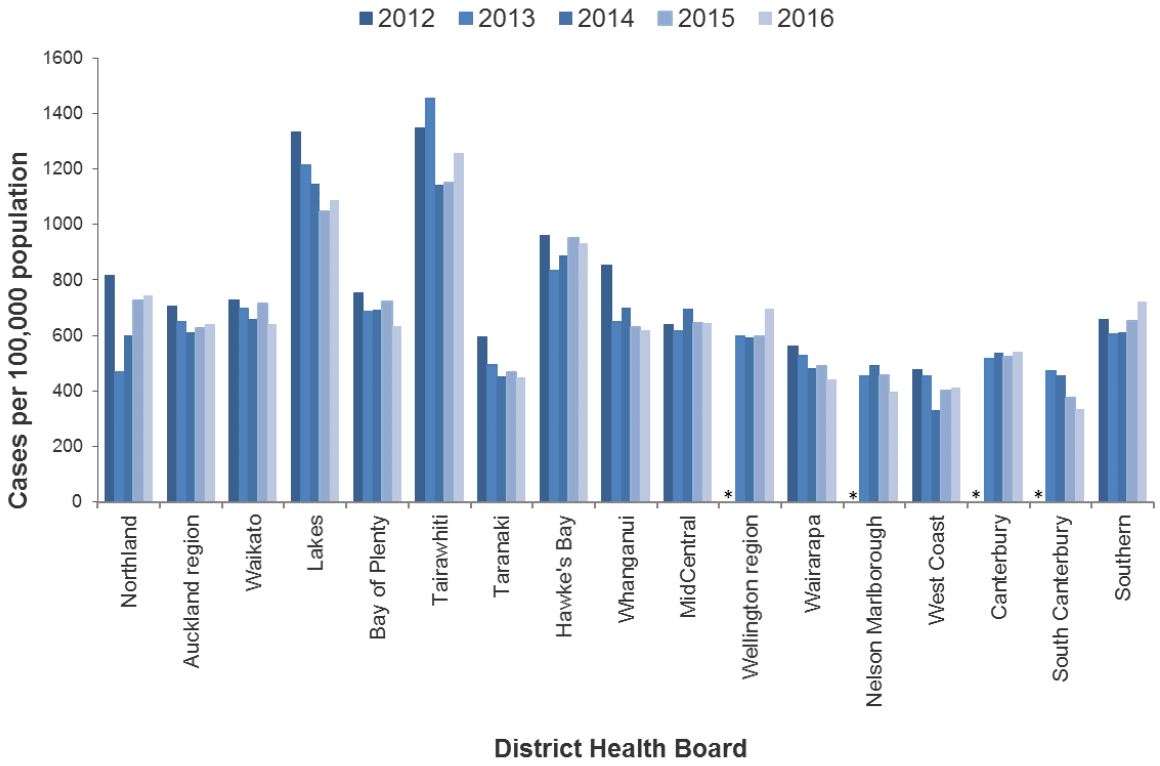
Nationally the population rate of chlamydia significantly decreased between 2012 and 2016, although there was a small but significant increase from 2015 to 2016 (Figure 1). Most DHBs reflected this pattern (Figure 2).

Figure 1. National chlamydia rate, 2012–2016



Note: The estimated rate was calculated for 2012 with 95% CIs based on data from 15 DHBs. All DHBs were included from 2013. New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Data collection).

Figure 2. Chlamydia rates by DHB, 2012–2016

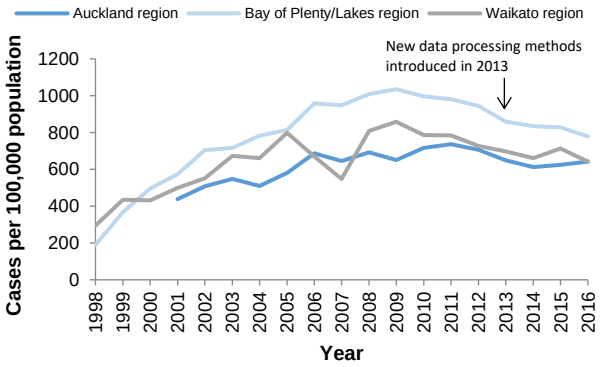


Note: Auckland region includes Waitemata, Auckland and Counties Manukau DHBs. Wellington region includes Hutt Valley and Capital & Coast DHBs. New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Data collection).

* Data incomplete.

Longer term trend analysis based on a limited number of DHBs show that prior to 2011 rates had generally been increasing (Figure 3).

Figure 3. Chlamydia rates in selected regions, 1998–2016



Note: Auckland region is comprised of Waitemata, Auckland and Counties Manukau DHBs.
NAAT testing introduced in Waikato and Bay of Plenty laboratories between 1998 and 2005, in Auckland laboratories by 2010.

AGE AND SEX DISTRIBUTION OF LABORATORY-CONFIRMED CASES

2016 analysis

Age was recorded for 99.6% and sex for 99.8% of laboratory-confirmed chlamydia cases. The national rate for females (899 per 100,000 population, 21,436 cases) was more than twice the national rate for males (393 per 100,000, 9065 cases). The highest rates of chlamydia in both males and females were reported in Tairawhiti, and Lakes DHBs (Table 8).

Table 8. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB and sex, 2016

DHB	Number of laboratory-confirmed cases				Rate per 100,000 population		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	320	952	0	1272	382	1088	743
Auckland region[a]	3144	7328	12	10484	392	884	643
Waikato	761	1807	0	2568	387	890	643
Lakes	286	873	0	1159	551	1600	1089
Bay of Plenty	400	1022	11	1433	365	874	632
Tairawhiti	134	467	1	602	576	1896	1256
Taranaki	137	385	2	524	238	651	449
Hawke's Bay	345	1156	3	1504	442	1384	931
Whanganui	100	291	0	391	326	900	620
MidCentral	356	770	1	1127	419	862	646
Wellington region[b]	1038	2111	7	3156	470	911	697
Wairarapa	47	146	0	193	222	653	443
Nelson Marlborough	175	403	2	580	244	542	397
West Coast	51	81	2	134	311	503	412
Canterbury	1024	1898	4	2926	377	709	543
South Canterbury	55	142	0	197	188	475	333
Southern	692	1604	6	2302	439	995	722
Total	**9065**	**21,436**	**51**	**30,552**	**393**	**899**	**651**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

Table 9 presents the number of laboratory-confirmed chlamydia cases, and chlamydia population rates by DHB and age group for 2016. Eighty-two percent (25,029) of positive cases were aged between 15 and 29 years.

Table 9. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB and age group, 2016

DHB	Age group (years)[c]																					
	0–4		5–9		10–14		15–19		20–24		25–29		30–34		35–39		40+		Unknown		Total	
	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000
Northland	5	44	0	-	33	276	478	4385	376	4080	215	2576	90	1136	36	460	39	43	0	-	1272	743
Auckland region[a]	21	19	0	-	139	139	2487	2218	3637	2660	2153	1502	900	732	491	462	654	95	2	-	10,484	643
Waikato	7	25	0	-	30	112	765	2692	957	3212	417	1600	185	797	104	464	103	56	0	-	2568	643
Lakes	2	-	0	-	39	517	486	6676	354	5531	144	2169	61	1036	36	596	36	71	1	-	1159	1089
Bay of Plenty	7	47	0	-	18	117	457	3176	463	3737	244	2063	109	966	62	539	63	53	10	-	1433	632
Tairawhiti	2	-	0	-	10	259	209	6129	207	6993	101	3563	32	1298	20	794	20	91	1	-	602	1256
Taranaki	3	-	0	-	5	65	137	1863	159	2424	71	1016	33	506	15	223	18	31	83	-	524	449
Hawke's Bay	0	-	0	-	44	387	603	5509	440	4825	217	2593	100	1308	45	539	55	67	0	-	1504	931
Whanganui	3	-	0	-	9	216	138	3511	143	3978	51	1491	21	669	8	265	10	30	8	-	391	620
MidCentral	3	-	0	-	11	98	397	3121	408	3103	154	1386	62	659	43	470	47	56	2	-	1127	646
Wellington region[b]	6	61	0	-	37	137	772	2538	1271	3408	520	1496	233	760	132	441	185	90	0	-	3156	697
Wairarapa	1	-	0	-	3	-	72	2662	60	2643	28	1421	12	602	6	278	11	46	0	-	193	443
Nelson Marlborough	0	-	0	-	10	108	186	2184	204	2910	77	1085	39	544	28	371	36	44	0	-	580	397
West Coast	0	-	0	-	2	-	32	1866	53	3072	22	1183	14	805	5	292	6	34	0	-	134	412
Canterbury	5	262	0	-	33	105	855	2308	1074	2614	491	1236	224	645	88	271	152	59	4	-	2926	543
South Canterbury	0	-	0	-	1	-	60	1709	81	2523	35	1120	10	343	7	238	3	9	0	-	197	333
Southern	0	-	0	-	8	43	717	3112	1016	3904	335	1619	111	585	54	293	57	37	4	-	2302	722
Total	**65[d]**	**21**	**0**	**-**	**432**	**147**	**8851**	**2779**	**10,903**	**3128**	**5275**	**1560**	**2236**	**748**	**1180**	**423**	**1495**	**68**	**115**	**-**	**30,552**	**651**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

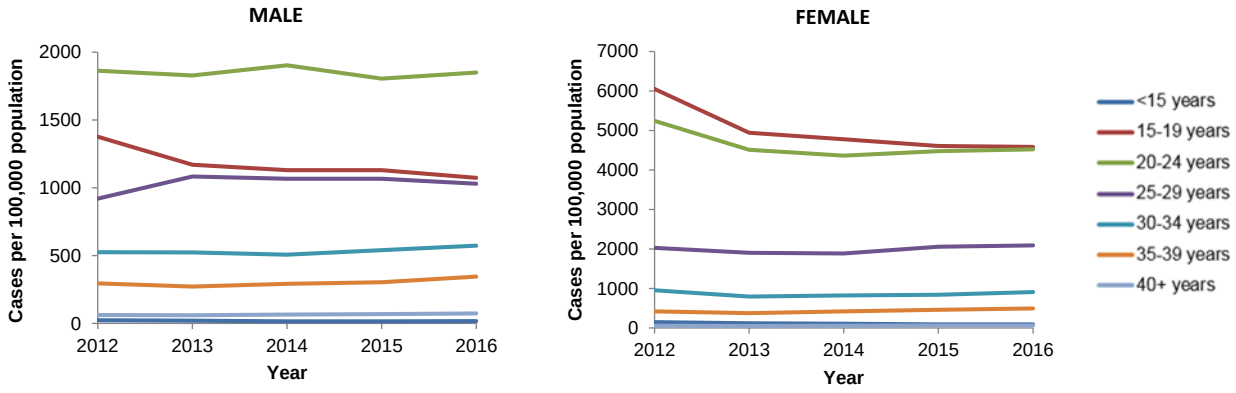
[c] Rates have not been calculated where there were fewer than five cases in any category.

[d] Includes 61 cases aged under one year

Trends in age and sex distribution of chlamydia

Between 2012 and 2016 the trend for chlamydia rates varied by age group and sex (Figure 4). Note the difference in scale. Although the rates for females were highest in the 15–19 years age group throughout this period, there was a non-significant increase in rates from 2014 to 2016 in both the 20–24 and 25–29 years age groups.

Figure 4. Chlamydia rates by age group and sex, 2012–2016



Note: Estimated rates were calculated for 2011 and 2012 based on data from 15 DHBs. All DHBs were included from 2013. New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Data collection).

ETHNICITY DISTRIBUTION OF LABORATORY-CONFIRMED CASES

2016 analysis

Ethnicity information was available for 89.1% of chlamydia cases. The highest estimated national rates were seen in the Māori ethnic group for both males (778 per 100,000, 2115 cases) and females (2622 per 100,000, 7504 cases) (Table 10). Sixty-one chlamydia cases were aged less than one year, and distribution of these cases across the ethnic groups is presented in Table 11.

Table 10. Number of laboratory-confirmed chlamydia cases and chlamydia rates by ethnicity and sex, 2016

Ethnicity	Number of laboratory-confirmed cases[a]				Rate per 100,000 population[a]		
	Male	Female	Unknown	Total	Male	Female	Total
Māori	2115	7504	5	9624	778	2622	1724
Pacific peoples	1035	2929	0	3964	720	2012	1370
Asian	443	927	1	1371	188	378	285
MELAA	136	155	0	291	559	687	621
European or Other	3730	7779	5	11514	256	514	388
Unknown	1469	1757	38	3264	-	-	-
Total	**8928**	**21051**	**49**	**30028**	**397**	**906**	**656**

[a] All counts and rates exclude Taranaki DHB.

Table 11. Specimen site of laboratory-confirmed chlamydia cases in the less than one year age group by ethnicity, 2016

Ethnicity	Specimen site of laboratory-confirmed cases[a]			
	Eye	Other	Unknown	Total
Māori	21	3	3	27
Pacific peoples	13	0	1	14
Asian	3	0	0	3
MELAA	1	0	0	1
European or Other	9	0	2	11
Unknown	3	1	1	5
Total	**50**	**4**	**7**	**61**

[a] All counts exclude Taranaki DHB.

Table 12 presents the number of laboratory-confirmed chlamydia cases, and chlamydia rates by ethnic group and sex for the age groups with the highest chlamydia rates for 2016 (15–19 years, 20–24 years and 25–29 years). Within these age groups the highest rates occurred in the Māori and Pacific peoples ethnic groups for both males and females. Rates amongst females were consistently higher than those of their male counterparts, and rates for female Māori were more than twice the estimated national rate in all three age groups.

Table 12. Number of laboratory-confirmed chlamydia cases and chlamydia rates by ethnicity, age group and sex, 2016

Ethnicity	Age group (years)[a]																	
	15–19						20–24						25–29					
	Cases			Rate per 100,000 population			Cases			Rate per 100,000 population			Cases			Rate per 100,000 population		
	Male	Female	Total[b]	Male	Female	Total[b]	Male	Female	Total[b]	Male	Female	Total[b]	Male	Female	Total[b]	Male	Female	Total[b]
Māori	647	2871	3522	2401	11246	6712	702	2293	2996	2858	9396	6119	351	1194	1545	1831	5532	3791
Pacific peoples	234	709	943	1618	5044	3307	423	1136	1559	3005	8259	5601	191	569	760	1592	4759	3173
Asian	34	110	144	189	674	420	121	273	395	437	1221	789	127	240	367	414	803	606
MELAA	10	28	38	553	1722	1106	39	59	98	1494	2885	2105	35	36	71	1122	1293	1202
European or Other	606	2664	3272	667	3099	1850	1516	3015	4534	1552	3317	2405	686	1130	1816	761	1270	1014
Unknown	200	593	795	-	-	-	538	618	1162	-	-	-	344	299	645	-	-	-
Total	**1731**	**6975**	**8714**	**1082**	**4617**	**2801**	**3339**	**7394**	**10744**	**1870**	**4523**	**3142**	**1734**	**3468**	**5204**	**1042**	**2104**	**1571**

[a] All counts and rates exclude Taranaki DHB.

[b] Includes unknown sex.

TEST POSITIVITY AND POPULATION TESTING RATES

2016 analysis by DHB, age group and sex

The population testing rate was 92 tests per 1000 population, and 7.6% of all tests were positive. However, specimen counts did not exclude repeat samples from the same individual.

Although the highest population testing rates were in Lakes DHB, and the Wellington and Auckland regions, Tairawhiti and Hawke's Bay DHBs had the highest test positivity (percentage of specimens that tested positive) (Table 13).

Table 13. Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by DHB, 2016

DHB	Total specimens	Tests per 1000 population	Test Positivity (%)[a]	Number of laboratory–confirmed cases [b]
Northland	12339	72	10.9	1272
Auckland region[c]	162075	99	7.1	10484
Waikato	34684	87	7.8	2568
Lakes	12068	113	10.0	1159
Bay of Plenty	18920	83	8.0	1433
Tairawhiti	4452	93	14.0	602
Taranaki	8919	76	6.4	524
Hawke's Bay	13151	81	11.9	1504
Whanganui	4609	73	9.1	391
MidCentral	13050	75	9.0	1127
Wellington region[d]	48235	107	6.9	3156
Wairarapa	2579	59	7.9	193
Nelson Marlborough	9107	62	6.7	580
West Coast	2089	64	6.7	134
Canterbury	48890	91	6.6	2926
South Canterbury	3441	58	5.9	197
Southern	30731	96	7.7	2302
Total	**429339**	**92**	**7.6**	**30552**

[a] Calculated using the number of positive specimens (includes repeat tests).

[b] Excludes repeat tests.

[c] Waitemata, Auckland and Counties Manukau DHBs.

[d] Includes Hutt Valley and Capital & Coast DHBs.

The national testing rate for males was 41 tests per 1000 population, whereas the rate for females was 141 per 1000. The highest population testing rates were reported in the 20–24 years age group for both males and females (Table 14).

In general males had higher test positivity compared with females, which needs to be interpreted in the context of their lower testing rates. For males test positivity was highest in the 15–19 years age group (18.3%). For females test positivity was the hightest in the 10–14 years age group (15.0%), however note that the testing rate in this age group was low (Table 14).

Table 14. Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases, by age group and sex, 2016

Age Group (years)	Total specimens[a]			Tests per 1000 population[a]			Test Positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
0–4	616	520	1146	4	4	4	6.7	7.3	6.9	29	33	62
5–9	43	143	186	0	1	1	0.0	0.0	0.0	0	0	0
10–14	405	2605	3012	3	19	11	13.8	15.0	14.9	53	372	427
15–19	9946	51972	61974	62	344	199	18.3	14.4	15.1	1731	6975	8714
20–24	23405	84866	108365	131	519	317	15.2	9.3	10.6	3339	7394	10744
25–29	18892	61025	79973	114	370	241	9.8	6.1	7.0	1734	3468	5204
30–34	11364	42237	53636	80	280	184	7.8	3.5	4.4	822	1379	2203
35–39	7932	29170	37139	61	206	136	6.2	2.6	3.4	459	704	1165
40+	20115	54592	74735	20	49	35	4.1	1.4	2.2	754	721	1477
Unknown	83	77	254	-	-	-	8.4	7.8	15.7	7	5	32
Total	**92801**	**327207**	**420420**	**41**	**141**	**92**	**10.3**	**6.9**	**7.7**	**8928**	**21051**	**30028**

[a] All counts, rates and percentages exclude Taranaki DHB.

[b] Calculated using the number of positive specimens (includes repeat tests).

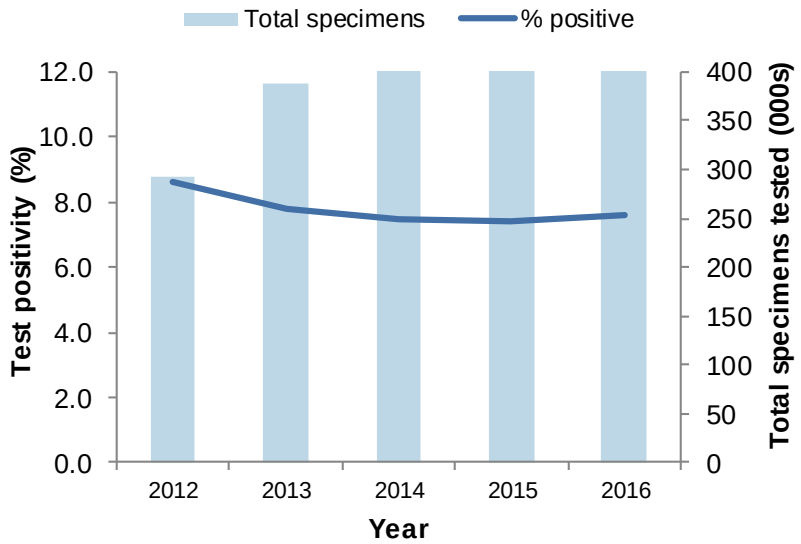
[c] Excludes repeat tests.

[d] Includes unknown sex.

Trends in test positivity

Between 2012 and 2016, test positivity based on all specimens decreased from 8.6% to 7.6% (Figure 5). During the same time period the number of specimens tested increased by 47%.

Figure 5. Test positivity and total specimens tested for chlamydia, 2012–2016



Note: 15 DHBs provided data in 2012. All DHBs provided data from 2013–2016.

Ethnicity analysis of test positivity and population testing rates

For both males and females the highest population testing rate was reported in the MELAA ethnic group (Table 15). However, test positivity was highest in the Pacific peoples ethnic group for both males and females (22.3% and 12.2%, respectively).

Table 15. Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test Positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	12009	66449	78487	44	232	141	18.6	12.1	13.1	2115	7504	9624
Pacific peoples	5104	26372	31481	36	181	109	22.3	12.2	13.8	1035	2929	3964
Asian	7454	33317	40787	32	136	85	6.7	3.0	3.7	443	927	1371
MELAA	2215	5437	7656	91	241	163	6.7	3.0	4.0	136	155	291
European or Other	49903	174756	224719	34	115	76	8.0	4.7	5.5	3730	7779	11514
Unknown	16116	20876	37290	-	-	-	9.5	8.8	9.2	1469	1757	3264
Total	**92801**	**327207**	**420420**	**41**	**141**	**92**	**10.3**	**6.9**	**7.7**	**8928**	**21051**	**30028**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

When further analysed by the highest risk age groups (15–19 years, 20–24 years and 25–29 years) a different pattern of testing rates and test positivity was seen (Table 16 to Table 18). For females, the highest population testing rates occurred in the Māori ethnic group across all three age groups. However for males, highest testing rates were in the Māori (15–19 years), European/Other (20–24 years) or MELAA (25–29 years) ethnic groups. In each of these age groups test positivity was highest for both males and females in the Pacific people's ethnic group.

Table 16. Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex in the 15–19 years age group, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test Positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	2458	14738	17207	91	577	328	27.6	21.0	21.9	647	2871	3522
Pacific peoples	787	3382	4170	54	241	146	32.5	23.4	25.1	234	709	943
Asian	394	1590	1984	22	97	58	9.9	7.4	7.9	34	110	144
MELAA	115	372	489	64	229	142	8.7	7.8	8.0	10	28	38
European or Other	5052	28075	33141	56	327	187	12.5	10.1	10.5	606	2664	3272
Unknown	1140	3815	4983	-	-	-	18.1	16.4	16.8	200	593	795
Total	**9946**	**51972**	**61974**	**62**	**344**	**199**	**18.3**	**14.4**	**15.1**	**1731**	**6975**	**8714**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

Table 17. Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex in the 20–24 years age group, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test Positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	3033	17167	20205	124	703	413	24.5	14.3	15.8	702	2293	2996
Pacific peoples	1497	6936	8434	106	504	303	31.7	17.9	20.4	423	1136	1559
Asian	1578	5013	6597	57	224	132	8.6	5.9	6.6	121	273	395
MELAA	333	1010	1343	128	494	288	12.3	6.2	7.7	39	59	98
European or Other	12952	48404	61381	133	533	326	12.4	6.6	7.8	1516	3015	4534
Unknown	4012	6336	10405	-	-	-	13.9	10.2	11.6	538	618	1162
Total	**23405**	**84866**	**108365**	**131**	**519**	**317**	**15.2**	**9.3**	**10.6**	**3339**	**7394**	**10744**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

Table 18. Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex in the 25–29 years age group, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test Positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	2275	12307	14587	119	570	358	16.1	10.5	11.4	351	1194	1545
Pacific peoples	1009	5329	6340	84	446	265	20.7	11.8	13.2	191	569	760
Asian	2095	7390	9490	68	247	157	7.0	3.5	4.3	127	240	367
MELAA	562	1161	1724	180	417	292	6.8	3.2	4.4	35	36	71
European or Other	9420	30535	39962	105	343	223	7.8	3.9	4.8	686	1130	1816
Unknown	3531	4303	7870	-	-	-	10.0	7.3	8.5	344	299	645
Total	**18892**	**61025**	**79973**	**114**	**370**	**241**	**9.8**	**6.1**	**7.0**	**1734**	**3468**	**5204**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

Analysis of testing coverage rates (percentage of people tested annually)

Coverage rates were lower than population testing rates for both males and females across the three highest risk age groups. Annual coverage rates for these age groups were between 4.6% and 8.9% for males and between 21.8% and 34.4% for females (Table 19).

The percentage decrease between population testing rates and coverage rates varied by ethnic group. For males, the Asian and MELAA ethnic groups showed the greatest percentage decrease, especially in the 25–29 years age group (over 45%). For females, the Māori and Pacific peoples ethnic groups showed the greatest percentage decreases across the age groups, ranging from 31% to 43%. This suggests many cases have been retested at least once.

Table 19. Percentage of chlamydia specimens tested that were positive, number of tests per 1000 population, coverage by ethnicity, age group and sex, 2016

Ethnicity	Age group (years)[a]																	
	15–19						20–24						25–29					
	Specimens tested positive (%)[b]		Total tests per 1000 population		Coverage (%)[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		Coverage (%)[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		Coverage (%)[c]	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Māori	27.6	21.0	91	577	7.0	33.2	24.5	14.3	124	703	9.0	42.7	16.1	10.5	119	570	8.3	37.0
Pacific peoples	32.5	23.4	54	241	3.9	15.4	31.7	17.9	106	504	7.3	32.4	20.7	11.8	84	446	5.9	30.6
Asian	9.9	7.4	22	97	1.4	6.9	8.6	5.9	57	224	3.3	16.5	7.0	3.5	68	247	3.6	19.6
MELAA	8.7	7.8	64	229	3.8	14.7	12.3	6.2	128	494	8.6	33.6	6.8	3.2	180	417	9.4	30.6
European or Other	12.5	10.1	56	327	4.2	20.9	12.4	6.6	133	533	8.9	35.2	7.8	3.9	105	343	6.9	25.0
Unknown	18.1	16.4	0	0	-	-	13.9	10.2	0	0	-	-	10.0	7.3	0	0	-	-
Total	**18.3**	**14.4**	**62**	**344**	**4.6**	**21.8**	**15.2**	**9.3**	**131**	**519**	**8.9**	**34.4**	**9.8**	**6.1**	**114**	**370**	**7.4**	**26.7**

[a] All percentages and rates exclude Taranaki DHB.

[b] Calculated using the number of positive specimens (includes repeat tests).

[c] Unique tests based on NHI and patient ID numbers.

SPECIMEN SITE

2016 analysis

The site from which the specimen was taken was recorded for 98.4% (32,142/32,672 specimens) of positive specimens. The most common site recorded for males was urine (84.1%) and for females was the vagina (39.6%) (Table 20). A total of 135 positive specimens were from the eye, of which 46.7% were from the 61 reported cases aged less than one year.

Table 20. Percentage of positive chlamydia tests by specimen site and sex, 2016

Specimen site	Sex[a]	
	Male (%)	Female (%)
Urethra	2.2	0.4
Vagina	-	39.6
Cervix	-	17.1
Penis	0.1	-
Anorectal	6.4	0.8
Eye	0.7	0.3
Urine	84.1	6.6
Urogenital[b]	3.7	30.0
Throat	1.1	0.2
Other	0.5	3.3

[a] Excludes specimens with unknown sex.

[b] Pooled specimens from more than one site.

Trends in specimen site

Figure 6 and Figure 7 present the percentage of positive chlamydia tests by specimen site for males and females from 2012 to 2016. The trend of increasing urine/decreasing urethral sites in males and increasing vaginal/decreasing cervical sites in females has continued, but this is expected due to changes in sampling techniques. There has been a further increase in urogenital sites in females in 2016 due to the way specimen sites are now being reported by some laboratories. In contrast, the increase in the proportion of positive tests from the anorectal site and throat in males since 2012 suggests possible changes in risk behaviours.

Figure 6. Specimen site, as a percentage of all positive chlamydia tests in males, 2012–2016

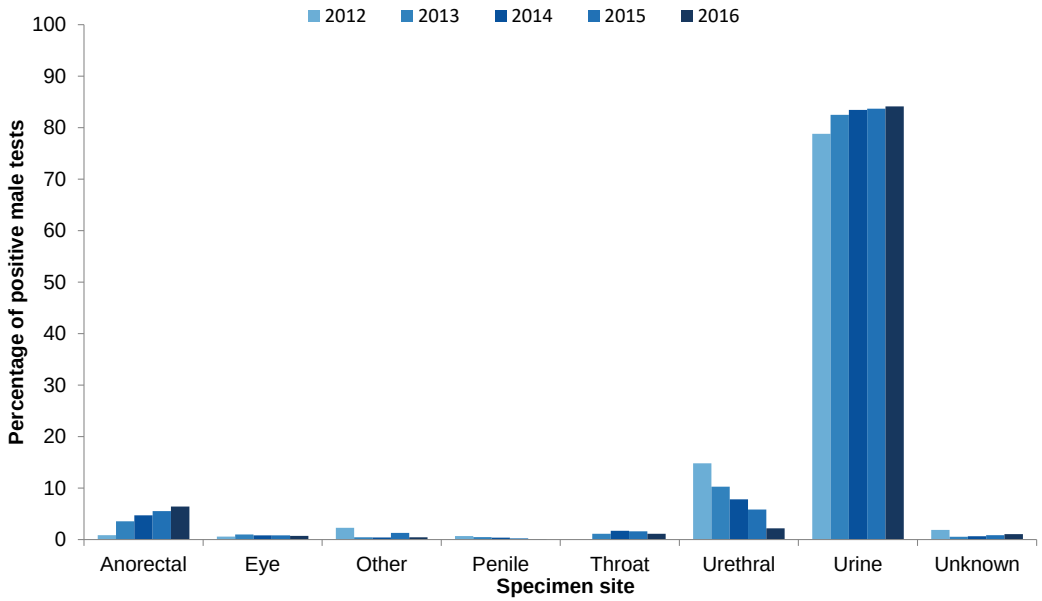
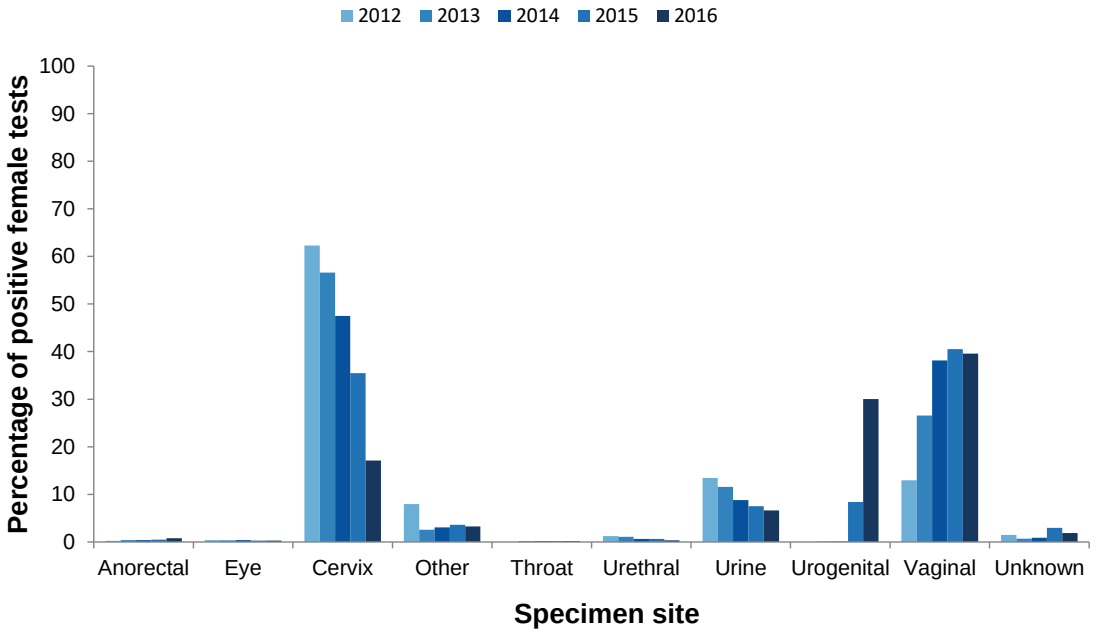


Figure 7. Specimen site, as a percentage of all positive chlamydia tests in females, 2012–2016



CLINIC SURVEILLANCE OF CHLAMYDIA

NATIONAL ANALYSIS

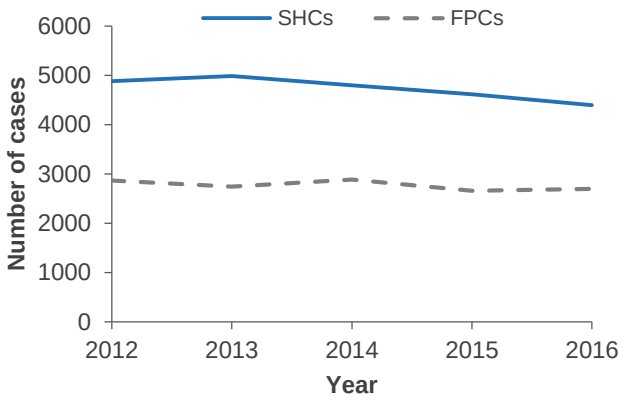
Chlamydia case numbers reported in 2016 (Table 21) decreased in SHCs by 4.9% and increased in FPCs by 1.5%, compared with 2015. However, there continues to be an overall decreasing trend since 2012 (Figure 8).

Between 2015 and 2016, the number of clinic visits reported by SHCs increased by 2.1% and clinic visits reported by FPCs increased by 0.4%. This suggests that there has been a decrease in prevalence of chlamydia among those attending SHCs but, a possible increase in prevalence among those attending FPCs. These findings should be viewed in the context of the overall national increase in incidence based on laboratory surveillance data (see Laboratory Surveillance of Chlamydia, National and DHB Analysis) and the uncertainty regarding the population demographics of those attending these clinics.

Table 21. Chlamydia case numbers by clinic type, 2016

Clinic type	Total number of cases
SHC	4393
FPC	2700
Total	**7093**

Figure 8. Chlamydia cases numbers by clinic type, 2012–2016



DHB COUNTS

Table 22. Chlamydia case numbers by clinic type and DHB, 2016

DHB[a]	Clinic type		Total
	SHC	FPC	
Northland	322	54	376
Auckland region[b]	1107	833	1940
Waikato	505	399	904
Lakes	255	0	255
Bay of Plenty	510	100	610
Tairawhiti	122	152	274
Taranaki	74	84	158
Hawke's Bay	83	0	83
Whanganui	29	51	80
MidCentral	190	0	190
Wellington region[c]	366	326	692
Nelson Marlborough	68	199	267
West Coast	39	13	52
Canterbury	440	254	694
South Canterbury	21	32	53
Southern	262	203	465

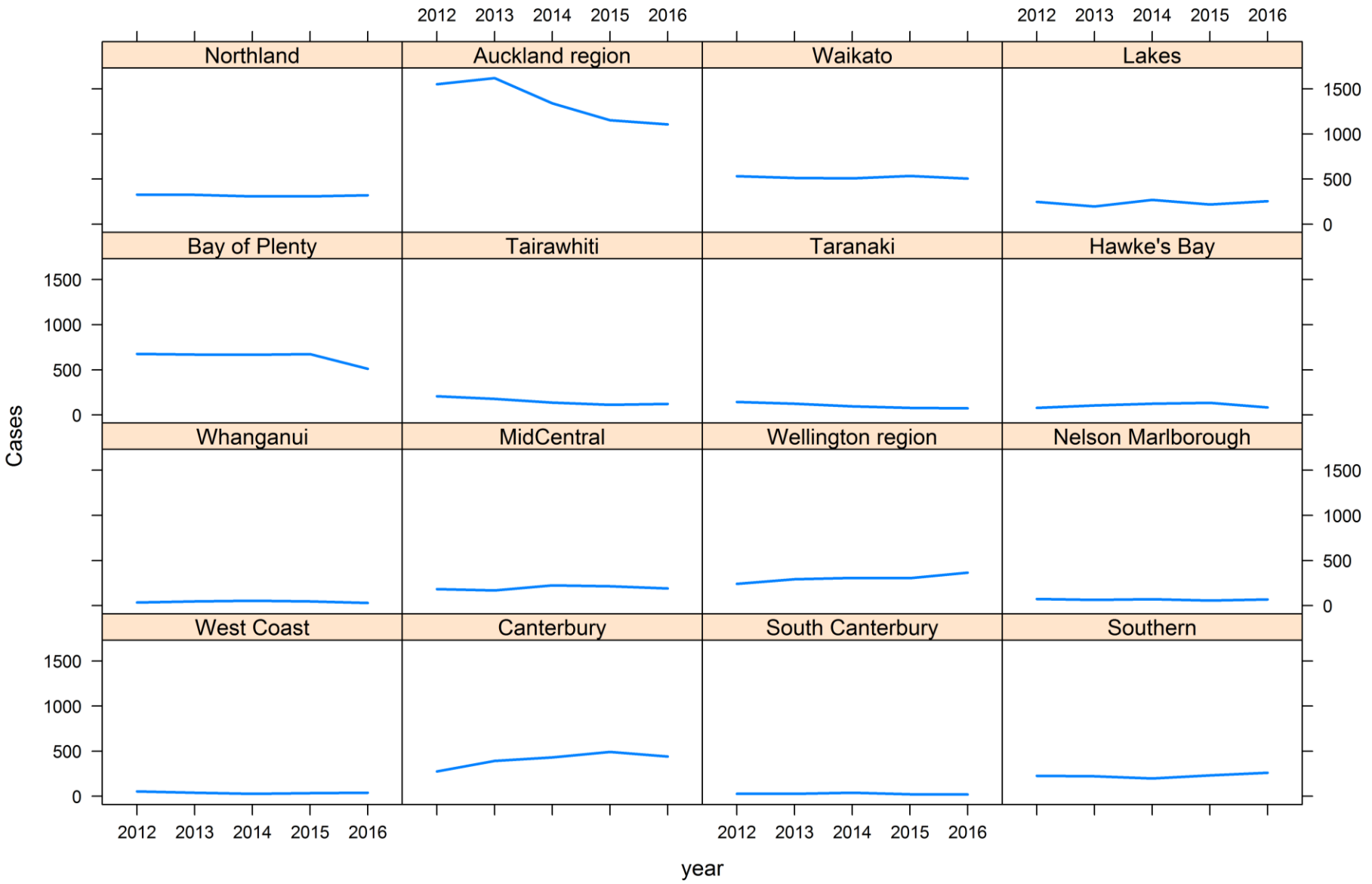
[a] Excludes Wairarapa DHB as no clinic.

[b] Waitemata, Auckland and Counties Manukau DHBs.

[c] Hutt Valley and Capital & Coast DHBs.

Variations in trends of cases reported to SHCs by DHB were seen from 2012 to 2016 (Figure 9). These may reflect patterns in clinic attendance.

Figure 9. Chlamydia case numbers in SHCs by DHB, 2012–2016



SEX, AGE AND ETHNICITY DISTRIBUTION OF CHLAMYDIA CASES

2016 analysis

Sex was recorded for 99.9% (7089/7093) of chlamydia cases in 2016. In SHCs, similar case numbers were reported for males and females, however, in FPCs more cases of chlamydia were reported in females (Table 23). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2016, the male to female ratio of visits at FPCs was 1:21) (also see Appendix A).

Table 23. Number of cases of chlamydia by sex and clinic type, 2016

Sex	Clinic type	
	SHC	FPC
Male	2335	429
Female	2056	2269
Total[a]	**4393**	**2700**

[a] Includes unknown sex.

Age was recorded for all chlamydia cases in 2016. A large proportion of the reported cases of chlamydia were aged less than 25 years: 56.3% in SHCs and 80.2% in FPCs (Figure 10 and Figure 11).

Figure 10. Confirmed chlamydia cases reported by SHCs by age group and sex, 2016

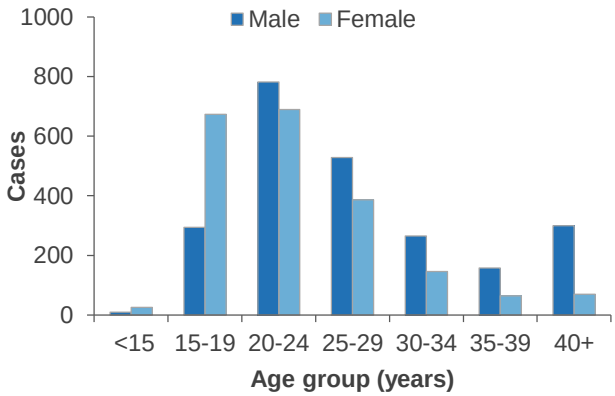
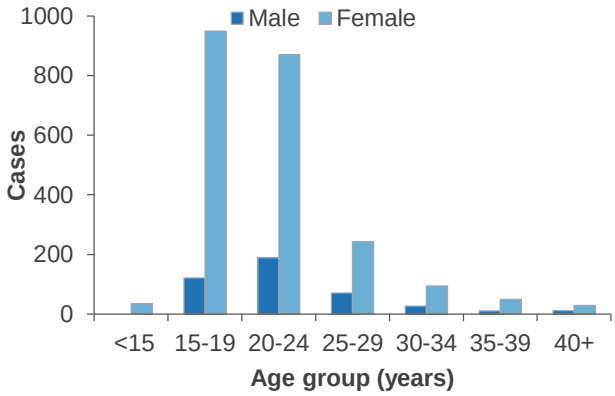


Figure 11. Confirmed chlamydia cases reported by FPCs by age group and sex, 2016



Ethnicity was recorded by SHCs and FPCs for over 98% of chlamydia cases. For males, the highest percentage of cases for both SHCs and FPCs reported European males (53.3% and 55.2%, respectively). For females, the highest percentage of cases for SHCs reported Māori ethnicity (46.4%) and for FPCs reported European ethnicity (52.2%) (Table 24).

Table 24. Confirmed chlamydia cases by ethnicity, sex and clinic setting, 2016

Ethnicity	SHC		FPC	
	Male	Female	Male	Female
European	1227	821	232	1168
Māori	642	940	128	720
Pacific peoples	158	145	37	233
Other	274	122	23	116
Unknown	34	28	9	32
Total[a]	**2335**	**2056**	**429**	**2269**

[a] Excludes unknown sex and transgender.

Trends in sex, age and ethnicity

Between 2012 and 2016, the number of confirmed chlamydia cases diagnosed in both SHCs and FPCs decreased in the 15–19 years age group. A decrease was also seen in the 20–24 years age group across both clinic types, except for females in FPCs which had a small increase. Small increases were seen in the number of confirmed cases diagnosed in both clinic types in the 25–29 years age group. The increasing trend for males diagnosed in SHCs in all age groups >30 years first noted in 2015 has continued (Figure 12 and Figure 13).

Figure 12. Chlamydia case numbers in SHCs by sex and age group, 2012–2016

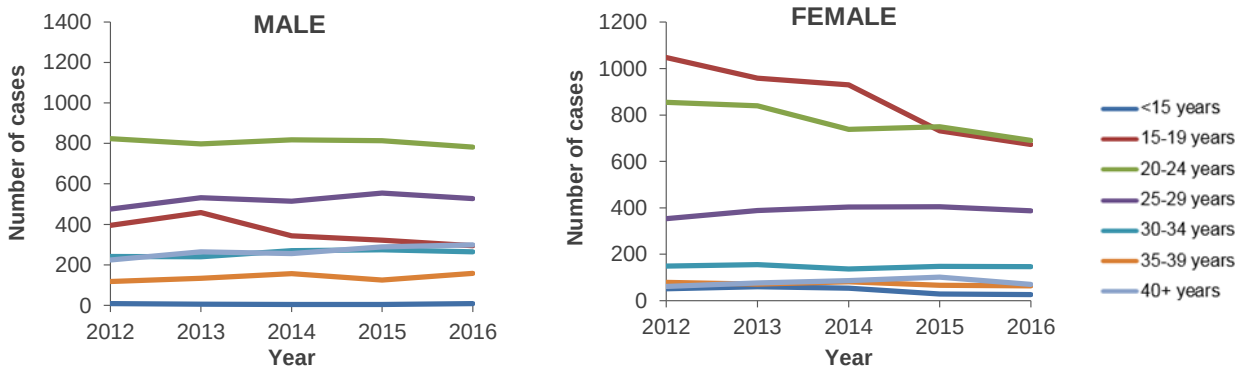
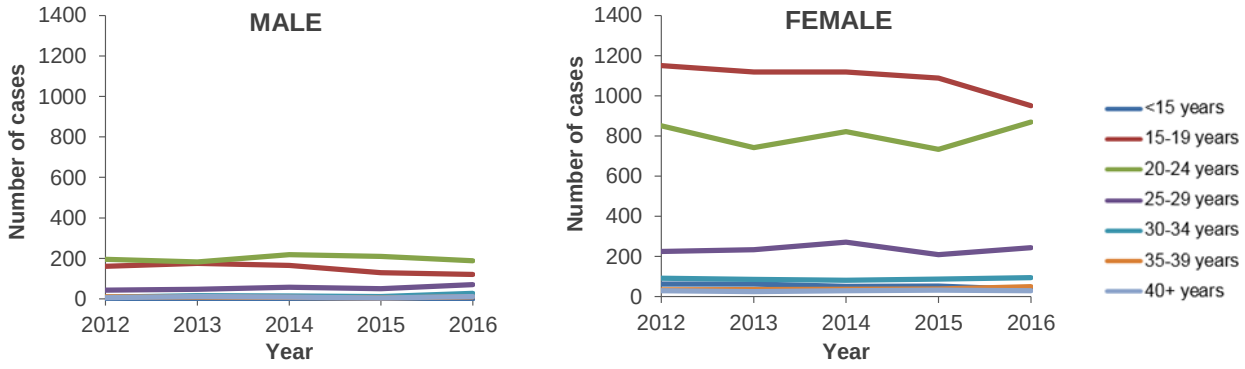


Figure 13. Chlamydia case numbers in FPCs by sex and age group, 2012–2016



In SHCs, there was a decrease in case numbers diagnosed in the European, Māori and Pacific peoples ethnic groups from 2012 to 2016 (Figure 14). This contrasts with pattern seen in FPCs where case numbers decreased in Māori and Pacific peoples ethnic groups, but were relatively stable in the European ethnic group (

Figure 14. Chlamydia case numbers reported from SHCs by ethnicity, 2012–2016

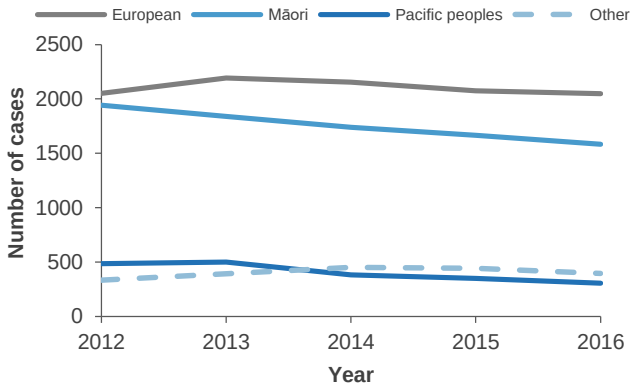
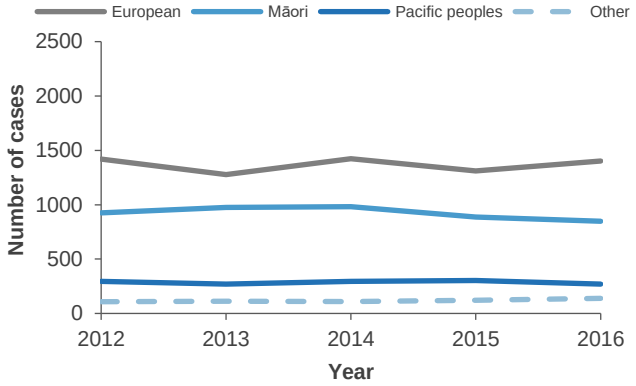


Figure 15. Chlamydia case numbers reported from FPCs by ethnicity, 2012–2016



SITE OF INFECTION

2016 analysis

In 2016, chlamydia cases were most commonly confirmed from a sample taken at a urogenital site in both clinic types: 97.9% of SHC cases and 97.0% of FPC cases (Table 25).

Table 25. Chlamydia case numbers by site of infection and clinic setting, 2016

Site	Clinic type	
	SHC	FPC
Urogenital	4302	2620
Pelvic inflammatory disease/epididymitis	45	74
Other site	77	11
Total[a]	**4393**	**2700**

[a] Cases where the infection was confirmed at more than one site are included in the tally for each site but are only counted once in the total.

COMPLICATED INFECTIONS

2016 analysis

Complicated infections (epididymitis in males and pelvic inflammatory disease (PID) in females) were reported for a small number of cases (1.0% in SHCs and 2.7% in FPCs) (Table 25). More than half of the 31 cases of epididymitis (61.3%) were in the < 25 years age group and were of European ethnicity (58.1%) (Table 26). The pattern was similar for PID, with the majority of the 88 cases in the < 25 years age group (72.7%) and of European ethnicity (47.7%) (Table 27).

Table 26. Epididymitis cases reported in males by age group, ethnicity and clinic type, 2016

Ethnicity	SHC			FPC		
	<25 years	25+ years	Total	<25 years	25+ years	Total
European	5	5	10	4	4	8
Māori	6	2	8	4	0	4
Pacific peoples	0	0	0	0	1	1
Other	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	**11**	**7**	**18**	**8**	**5**	**13**

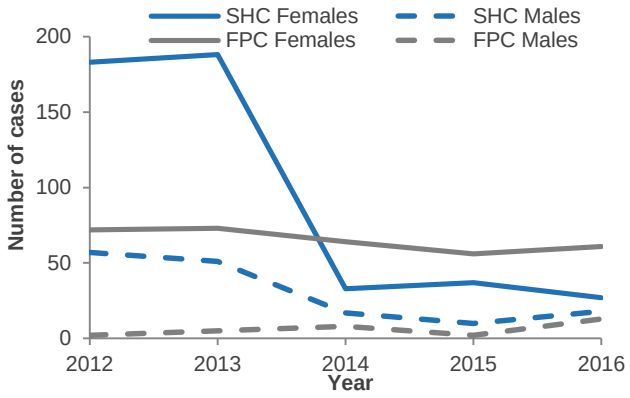
Table 27. PID cases reported in females by age group, ethnicity and clinic type, 2016

Ethnicity	SHC			FPC		
	<25 years	25+ years	Total	<25 years	25+ years	Total
European	4	2	6	29	7	36
Māori	14	6	20	13	3	16
Pacific peoples	0	0	0	3	4	7
Other	0	1	1	1	1	2
Unknown	0	0	0	0	0	0
Total	**18**	**9**	**27**	**46**	**15**	**61**

Trends in complicated infections

Figure 16 presents the number of epididymitis cases in males and PID cases in females reported by SHCs and FPCs from 2012 to 2016. Notably, the numbers of complicated infections seen in SHCs have decreased by more than two thirds in both males and females (57 to 18 cases and 183 to 27 cases, respectively). There was an increase in the numbers of complicated infections for males seen in FPCs (2 to 13 cases).

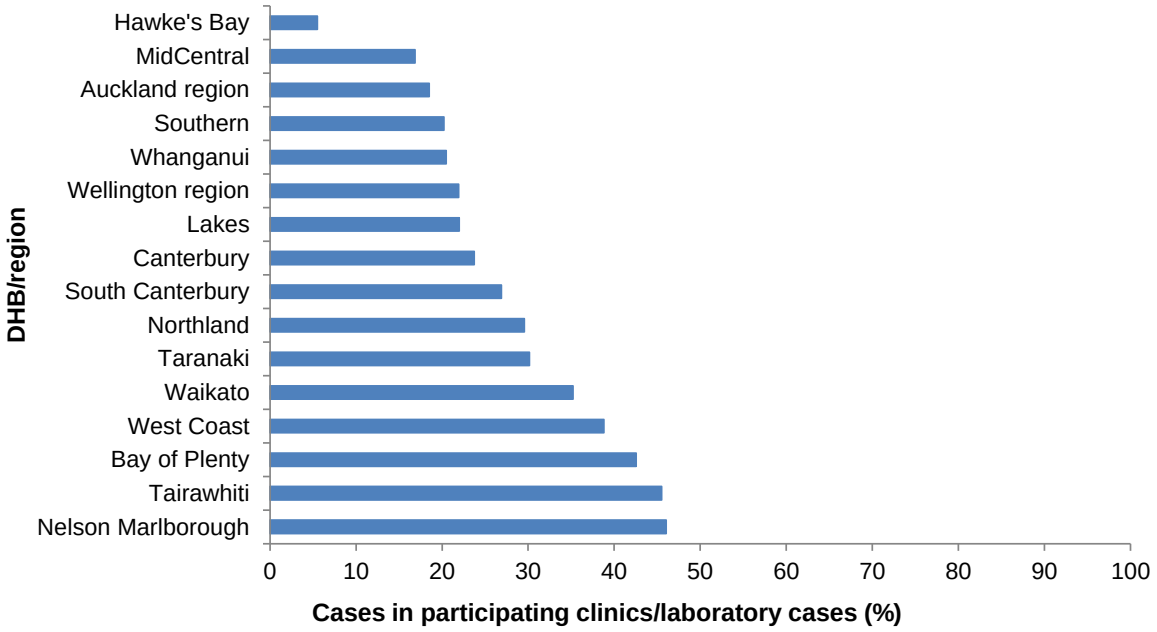
Figure 16. Numbers of epididymitis cases in males and PID cases in females by clinic type, 2012–2016



COMPARISON OF LABORATORY AND CLINIC SURVEILLANCE

The number of cases seen in participating clinics (all SHCs and FPCs) as a proportion of laboratory cases by DHB/region are presented in Figure 17. The proportion of cases diagnosed in settings other than a participating clinic ranged from 54% to 95% with an average of 72% nationally. Chlamydia cases that were not reported from a SHC or FPC are likely to have been diagnosed in a primary care facility.

Figure 17. Cases of chlamydia seen in participating clinics* as a proportion (%) of all positive laboratory tests by DHB, 2016



* All public sexual health and family planning clinics in New Zealand participate in clinic-based STI surveillance.

GONORRHOEA

Infections due to *Neisseria gonorrhoeae* can cause dysuria and urethral discharge in males and vaginal discharge in females. Asymptomatic infection can occur in up to 5% of males and 50% of females [17]. Untreated gonococcal infection may be associated with long-term serious sequelae, including PID in females, epididymo-orchitis in males and severe conjunctivitis in neonates [16].

KEY FINDINGS: 2016

- The national rate of gonorrhoea was 82 cases per 100,000 population, a significant increase from the 2015 rate of 75 cases per 100,000
- Between 2012 and 2016, test positivity increased slightly from 1.0% to 1.1% during which time the number of specimens tested increased by 21% with 79% of specimens from females
- The highest rate of gonorrhoea was reported in Tairawhiti DHB (211 cases per 100,000 population), a small, but non-significant, decrease from the 2015 rate (229 per 100,000)
- 50.5% of laboratory-confirmed cases were diagnosed in the Auckland region (1953 cases) and the Auckland rate of 120 per 100,000 was a significant increase from 2015 (109 per 100,000)
- The national rate for males was higher than for females (98 and 66 per 100,000 respectively) with male rates higher than the female rates in all regions with large urban centres
- 69% (2672) of cases diagnosed were aged 15–29 years and four cases were aged <1 year
- In those aged 15–29 years the highest estimated gonorrhoea rates were predominantly reported in the Māori and Pacific peoples ethnic groups
- Estimated national rates for males were higher than female across all ethnicities apart from Māori, and this pattern was also seen in the high risk age groups apart from Pacific peoples and European/Other (15–19 years) ethnicities where female rates were higher than male
- Annual population testing rates across all age groups were more than three times higher for females compared with males, with the highest testing rates in the 15–34 years age group
- Annual testing coverage rates in the highest-risk age groups suggest that <10% of males and 22–35% of females in these age groups had at least one annual test.
- An increasing number of gonorrhoea cases were diagnosed via anorectal and throat specimens in males (>30% of positive tests), and in throat specimens in females
- Four *N. gonorrhoeae* isolates with decreased susceptibility to ceftriaxone were identified in 2016 in Waikato (2 cases) and Canterbury (2 cases) DHBs
- 63% of cases were diagnosed in primary care settings

COMMENTARY

There was a significant increase in the national gonorrhoea rate in 2016, largely driven by the increased rate in the Auckland region where the rate is higher for males compared with females. It is unclear whether this reflects a true increase in incidence or is due to increased testing and screening of infected people, particularly males who are now able to be tested on a urine sample rather than a urethral swab. As in recent years a higher rate in males was also reported in other regions with large urban centres (Wellington region, Waikato, Canterbury and Southern DHBs), all regions where there has been an increase in syphilis cases numbers among MSM. The increased proportion of positive tests diagnosed from throat and anorectal swabs suggests there may be increased testing and case finding in MSM. Despite the overall higher rates in males compared with females, the much lower testing and coverage rates in males compared with females suggests that many infections in males remain undiagnosed and untreated, highlighting the need for interventions to increase testing rates in males. There is a difference across ethnic groups with a higher gonorrhoea rate in Māori females, all age groups, and in younger females of Pacific peoples ethnicity, compared with males. These differing patterns among ethnicities and geographic settings suggest that a range of strategies are needed for control of gonorrhoea.

LABORATORY SURVEILLANCE OF GONORRHOEA

NATIONAL AND DHB ANALYSIS

2016 analysis

In 2016 there were 3865 laboratory-confirmed cases of gonorrhoea. The national gonorrhoea rate was 82 per 100,000 population, a significant increase from the 2015 rate of 75 per 100,000 population. Case numbers and population rates for each DHB for the past two years are shown in Table 28.

Table 28. Number of gonorrhoea laboratory-confirmed cases and gonorrhoea rates by DHB, 2015–2016

DHB	Number of laboratory-confirmed cases		Rate per 100,000 population		Rate change[c,e]
	2015	2016	2015	2016	
Northland	124	173	74	101	↑
Auckland region[a]	1733	1953	109	120	↑
Waikato	362	305	93	76	↓
Lakes	163	128	155	120	↓
Bay of Plenty	133	189	60	83	↑
Tairawhiti	108	101	229	211	↓
Taranaki	10	22	9	19	↑
Hawke's Bay	149	197	93	122	↑
Whanganui	31	25	50	40	↓
MidCentral	75	44	44	25	↓
Wellington region[b]	238	349	53	77	↑
Wairarapa	4	2	-	-	-
Nelson Marlborough	39	34	27	23	↓
West Coast	3	6	-	18	-
Canterbury	161	219	31	41	↑
South Canterbury	6	23	10	39	↑
Southern	85	95	27	30	↑
Total	**3424**	**3865**	**75**	**82**	↑

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

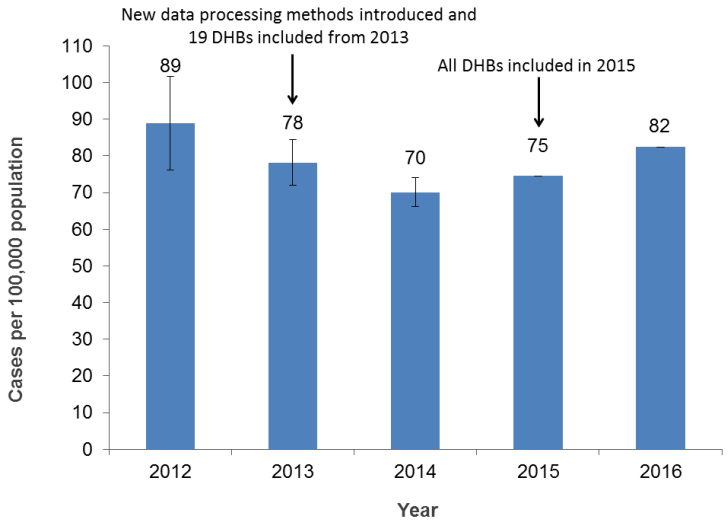
[c] ↓ = significant decrease, ↑ = significant increase, NC = no change, ↓ = not significant decrease, ↑ = not significant increase.

[d] Fisher's exact tests were used to determine statistical significance. Results are considered statistically significant when the *P* value is less than or equal to 0.05.

Trends in laboratory diagnoses

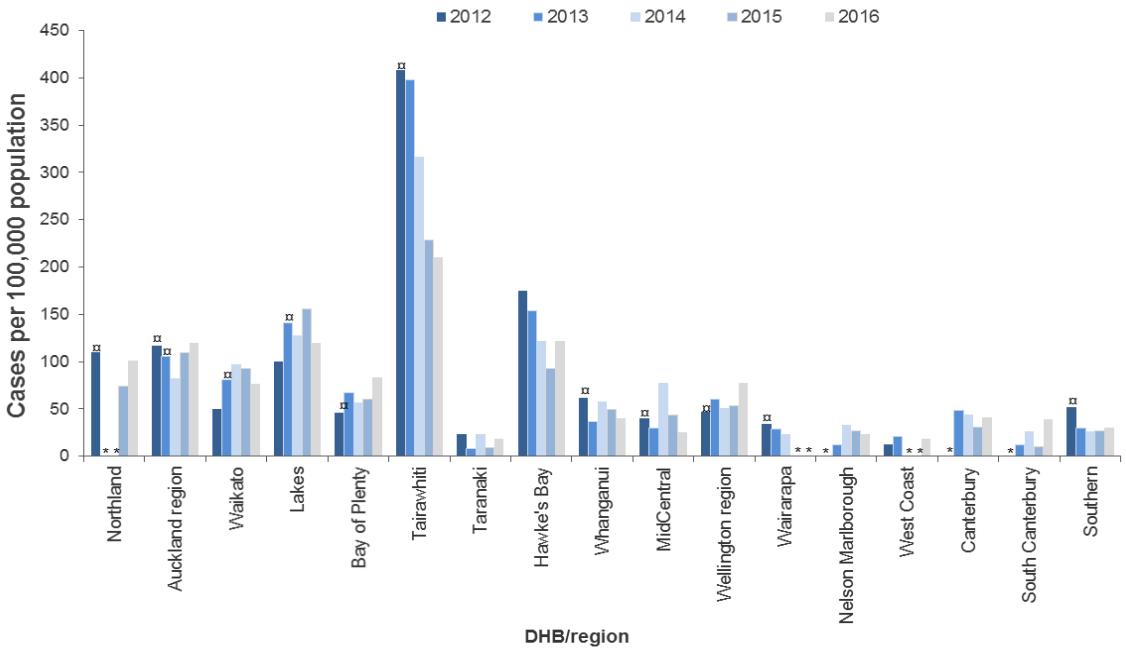
From 2012 to 2016, there was a decrease in the national gonorrhoea rate (Figure 18). The gonorrhoea rate varied among DHBs and across years (Figure 19).

Figure 18. National gonorrhoea rate*, 2012–2016



* Note: Estimated rates with 95% CIs were calculated for 2012 based on data from 17 DHBs and for 2013 and 2014 on data from 19 DHBs. From 2015 the rate is no longer an estimate as all DHBs were included. New data processing methods allow for exclusion of repeat tests within a defined period (see Data collection). Introduction of NAAT testing began in 2011, with most labs using this method by 2013.

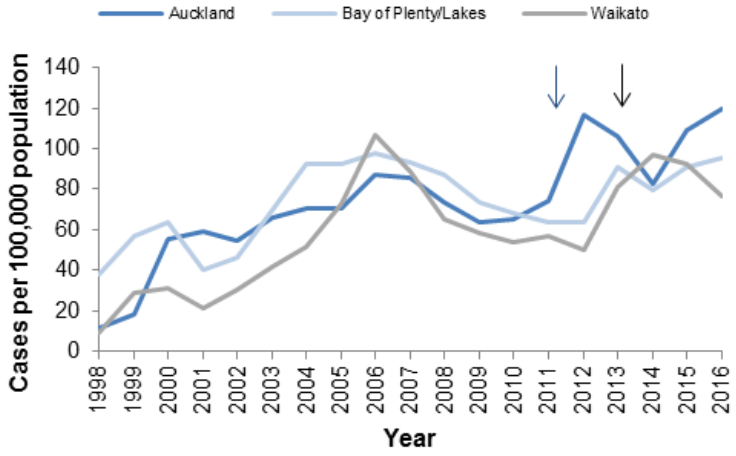
Figure 19. Gonorrhoea rates by DHB, 2012–2016



Note: Auckland region includes Waitemata, Auckland and Counties Manukau DHBs.
Wellington region includes Hutt Valley and Capital & Coast DHBs.
* Data incomplete or rate not calculated as fewer than five cases.
¤ Introduction of NAAT testing (see Surveillance methods).

Longer term trend analysis based on a limited number of DHBs show that since 1998 rates have generally been increasing (Figure 20).

Figure 20. Gonorrhoea rates in selected regions, 1998–2016



Note: Auckland region includes Waitemata, Auckland and Counties Manukau DHBs. New data processing methods introduced in 2013.

↓ NAAT testing was introduced in the Auckland region in 2011 (Labplus) and 2012 (Labtests).

↓ NAAT testing was introduced in the Bay of Plenty/Lakes region and the Waikato region (Pathlab) in 2013.

AGE AND SEX DISTRIBUTION OF LABORATORY-CONFIRMED CASES

2016 analysis

Age and sex information was recorded for 99.2% of laboratory-confirmed gonorrhoea cases. The national rate for males (98 per 100,000 population, 2270 cases) was higher than the national rate for females (66 per 100,000 population, 1565 cases). Both of these rates were higher than the respective 2015 rates for males (86 per 100,000) and females (63 per 100,000).

For both males and females, gonorrhoea rates higher than the national average were reported in the Auckland region and in Tairawhiti, Hawke's Bay and Lakes DHBs. Rates higher than the national average were also reported for females in Northland and Bay of Plenty DHBs, and for males in the Wellington region (Table 29).

Table 29. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and sex, 2016

DHB	Number of laboratory-confirmed cases				Rate per 100,000 population[c]		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	74	99	0	173	88	113	101
Auckland region[a]	1233	719	1	1953	154	87	120
Waikato	153	152	0	305	78	75	76
Lakes	51	77	0	128	98	141	120
Bay of Plenty	71	108	10	189	65	92	83
Tairawhiti	33	67	1	101	142	272	211
Taranaki	18	4	0	22	31	7	19
Hawke's Bay	82	114	1	197	105	137	122
Whanganui	16	9	0	25	52	28	40
MidCentral	23	20	1	44	27	22	25
Wellington region[b]	292	55	2	349	132	24	77
Wairarapa	1	1	0	2	-	-	-
Nelson Marlborough	19	15	0	34	26	20	23
West Coast	3	3	0	6	-	-	18
Canterbury	139	75	5	219	51	28	41
South Canterbury	11	10	2	23	38	33	39
Southern	51	37	7	95	32	23	30
Total	**2270**	**1565**	**30**	**3865**	**98**	**66**	**82**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

[c] Rates have not been calculated where there were fewer than five cases in any category.

Table 30 presents the number of laboratory-confirmed gonorrhoea cases, and gonorrhoea population rates by DHB and age group for 2016. Sixty-nine percent (2672) of positive cases were aged between 15 and 29 years.

Table 30. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and age group, 2016

DHB	Age group (years)[c]																					
	0–4		5–9		10–14		15–19		20–24		25–29		30–34		35–39		40+		Unknown		Total	
	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000
Northland	0	-	0	-	4	-	32	294	52	564	41	491	24	303	4	-	16	18	0	-	173	101
Auckland region[a]	2	-	0	-	21	21	393	350	557	407	379	264	213	173	131	123	257	37	0	-	1953	120
Waikato	0	-	0	-	5	19	106	373	97	326	31	119	26	112	18	80	22	12	0	-	305	76
Lakes	0	-	0	-	4	-	43	591	16	250	28	422	16	272	8	132	13	26	0	-	128	120
Bay of Plenty	1	-	0	-	2	-	61	424	36	291	27	228	22	195	11	96	19	16	10	-	189	83
Tairawhiti	0	-	0	-	3	-	32	938	35	1182	18	635	6	243	3	-	4	-	0	-	101	211
Taranaki	0	-	0	-	0	-	1	-	6	91	2	-	2	-	0	-	4	-	7	-	22	19
Hawke's Bay	1	-	0	-	6	53	83	758	59	647	28	335	13	170	0	-	6	7	1	-	197	122
Whanganui	0	-	0	-	0	-	2	-	9	250	8	234	3	-	1	-	2	-	0	-	25	40
MidCentral	1	-	0	-	1	-	7	55	11	84	6	54	4	-	7	77	5	6	2	-	44	25
Wellington region[b]	0	-	0	-	2	-	41	135	86	231	74	213	49	160	33	110	64	31	0	-	349	77
Wairarapa	0	-	0	-	0	-	0	-	1	-	1	-	0	-	0	-	0	-	0	-	2	-
Nelson Marlborough	0	-	1	-	0	-	4	-	9	128	7	99	0	-	2	-	11	13	0	-	34	23
West Coast	0	-	0	-	0	-	2	-	2	-	0	-	1	-	0	-	1	-	0	-	6	18
Canterbury	0	-	0	-	4	-	57	154	56	136	41	103	15	43	9	28	32	12	5	-	219	41
South Canterbury	0	-	0	-	0	-	6	171	8	249	4	-	1	-	0	-	2	-	2	-	23	39
Southern	0	-	0	-	0	-	13	56	37	142	17	82	10	53	4	-	7	5	7	-	95	30
Total	**5**	**2**	**1**	**-**	**52**	**18**	**883**	**277**	**1077**	**309**	**712**	**211**	**405**	**136**	**231**	**83**	**465**	**21**	**34**	**-**	**3865**	**82**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

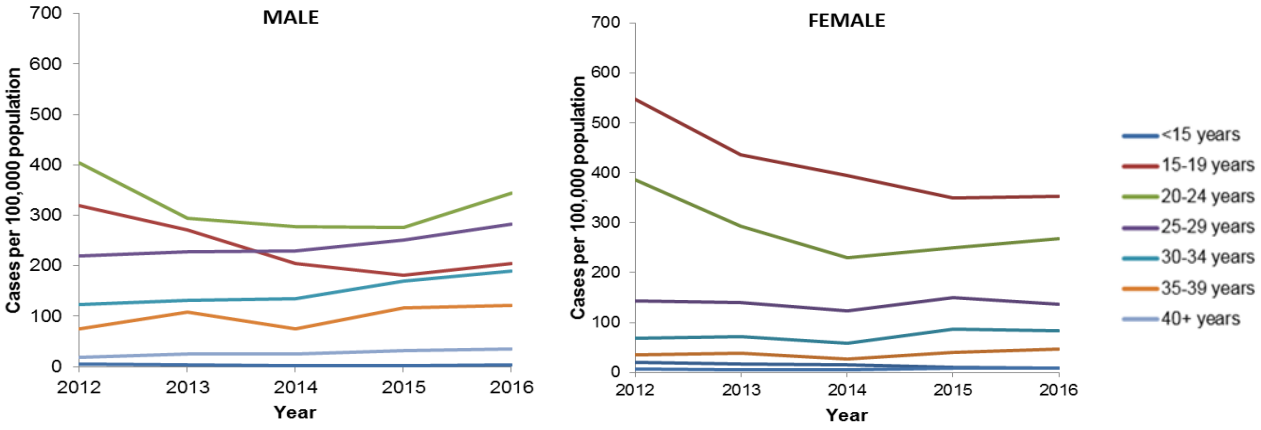
[c] Rates have not been calculated where there were fewer than five cases in any category.

[d] Includes four cases under one year of age.

Trends in age and sex distribution of gonorrhoea cases

Between 2012 and 2016 the trend for gonorrhoea rates varied by age group and sex (Figure 21).

Figure 21. Gonorrhoea rates by sex and age group, 2012–2016



Note: Estimated rates were calculated for 2012 based on data from 17 DHBs, and for 2013 and 2014 on data from 19 DHBs. All DHBs were included from 2015. New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Data collection).

ETHNICITY DISTRIBUTION OF LABORATORY-CONFIRMED CASES

2016 analysis

Ethnicity information was recorded for 85.5% of gonorrhoea cases based on data from 19/20 DHBs. The highest estimated national rates were seen in the Pacific peoples ethnic group for males (231 per 100,000, 332 cases) and the Māori ethnic group for females (256 per 100,000, 733 cases) (Table 31). Ethnicity was reported for three of the four laboratory-confirmed gonorrhoea cases reported in the less than one year age group, one case each in the Māori, European and Other and Pacific peoples ethnic groups. Specimen sites were reported for these four cases as eye (2 cases) and throat (1 case) and unknown (1 case).

Table 31. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by ethnicity and sex, 2016

Ethnicity	Number of laboratory-confirmed cases[a]				Rate per 100,000 population[a]		
	Male	Female	Unknown	Total	Male	Female	Total[b]
Māori	469	733	1	1203	172	256	216
Pacific peoples	332	243	0	575	231	167	199
Asian	159	47	0	206	67	19	43
MELAA	55	9	0	64	226	40	136
European or Other	876	362	0	1238	60	24	42
Unknown	361	167	29	557	-	-	-
Total	**2252**	**1561**	**30**	**3843**	**100**	**67**	**84**

[a] All counts and rates exclude Taranaki DHB.

[b] Includes unknown sex.

Table 32 presents the number of gonorrhoea cases, and gonorrhoea rates by ethnic group and sex for the age groups with the highest gonorrhoea rates for 2016 (15–19 years, 20–24 years and 25–29 years). Within these age groups the highest rates predominantly occurred in the Māori and Pacific peoples ethnic groups for both sexes, and in the MELAA ethnic group for males aged 20-24 years and 25–29 years. Rates amongst females were consistently higher than those of their male counterparts, and in each age group the Māori female rate was more than three times greater than the estimated national rate for that age group and sex.

Table 32. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by ethnicity, age group and sex, 2016

Ethnicity	Age group (years)[a,b]																	
	15–19						20–24						25–29					
	Cases			Rate per 100,000 population			Cases			Rate per 100,000 population			Cases			Rate per 100,000 population		
	Male	Female	Total[c]	Male	Female	Total[c]	Male	Female	Total[c]	Male	Female	Total[c]	Male	Female	Total[c]	Male	Female	Total[c]
Māori	131	306	437	486	1199	833	137	203	341	558	832	696	93	93	186	485	431	456
Pacific peoples	89	90	179	615	640	628	119	68	187	845	494	672	60	41	101	500	343	422
Asian	9	7	16	50	43	47	44	10	54	159	45	108	51	9	60	166	30	99
MELAA	3	0	3	-	-	-	13	3	16	498	-	344	16	2	18	513	-	305
European or Other	76	90	166	84	105	94	215	110	325	220	121	172	179	59	238	199	66	133
Unknown	28	53	81	-	-	-	97	51	148	-	-	-	80	27	107	-	-	-
Total	**336**	**546**	**882**	**210**	**361**	**284**	**625**	**445**	**1071**	**350**	**272**	**313**	**479**	**231**	**710**	**288**	**140**	**214**

[a] Rates have not been calculated where there were fewer than five cases in any category.

[b] All counts and rates exclude Taranaki DHB.

[c] Includes unknown sex.

TEST POSITIVITY AND POPULATION TESTING RATES

2016 analysis by DHB, age group and sex

The estimated population testing rate was 99 gonorrhoea tests per 1000 population, and 1.1% of all tests were positive. However, specimen counts did not exclude repeat samples from the same individual.

The highest population testing rates were in the Lakes and Canterbury DHBs and the Auckland and Wellington regions. However, Tairawhiti DHB had the highest test positivity (percentage of specimens that tested positive) (Table 33).

Table 33. Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by DHB, 2016

DHB	Total specimens	Tests per 1000 population	Test positivity (%)[a]	Number of laboratory-confirmed cases[b]
Northland	16567	97	1.2	173
Auckland region[c]	174212	107	1.6	1953
Waikato	36813	92	1.0	305
Lakes	12097	114	1.2	128
Bay of Plenty	18936	84	1.1	189
Tairawhiti	4513	94	2.3	101
Taranaki[d]	11394	98	0.2	22
Hawke's Bay	14020	87	1.8	197
Whanganui	5189	82	0.6	25
MidCentral	13327	76	0.4	44
Wellington region[e]	48509	107	1.0	349
Wairarapa	2736	63	0.1	2
Nelson Marlborough[f]	9132	62	0.4	34
West Coast	2089	64	0.3	6
Canterbury	61605	114	0.6	219
South Canterbury	4339	73	0.7	23
Southern	30959	97	0.5	95
Total	**466437**	**99**	**1.1**	**3865**

[a] Calculated using the number of positive specimens (includes repeat tests).
[b] Excludes repeat tests.
[c] Waitemata, Auckland and Counties Manukau DHBs.
[d] All testing by culture.
[e] Hutt Valley and Capital & Coast DHBs.
[f] Two tests for most patients (culture and NAAT).

The estimated national testing rate for males was 45 tests per 1000 population, whereas for females was 152 per 1000. The highest population testing rates were reported in the 20–24 years age group for both males and females (Table 34). Males had higher test positivity across all age groups compared to females apart from the 5–9 years age group. For males test positivity was highest in the 15–19 years age group (4.6%), whereas for females it was in the 10–14 years age group (1.7%).

Table 34. Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory–confirmed cases, by age group and sex, 2016

Age group (years)	Total specimens[a]			Tests per 1000 population[a]			Test positivity (%)[a,b]			Number of laboratory–confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
0–4	789	679	1480	5	5	5	0.4	0.1	0.3	3	1	5
5–9	67	211	278	0	1	1	0.0	1.4	1.1	0	1	1
10–14	441	2802	3245	3	20	11	3.9	1.7	2.0	13	39	52
15–19	10513	54523	65092	66	361	209	4.6	1.2	1.8	336	546	882
20–24	24960	89943	114998	140	550	336	3.8	0.6	1.3	625	445	1071
25–29	20467	65930	86451	123	400	261	3.6	0.4	1.2	479	231	710
30–34	12260	46326	58621	87	308	201	3.3	0.3	1.0	274	129	403
35–39	8622	31941	40603	66	225	149	3.0	0.3	0.8	163	67	231
40+	22297	61653	83980	22	55	39	2.3	0.2	0.8	358	101	461
Unknown	111	83	295	-	-	-	0.9	1.2	10.8	1	1	27
Total	**100527**	**354091**	**455043**	**45**	**152**	**99**	**3.4**	**0.5**	**1.2**	**2252**	**1561**	**3843**

[a] All counts, rates and percentages exclude Taranaki DHB.

[b] Calculated using the number of positive specimens (includes repeat tests).

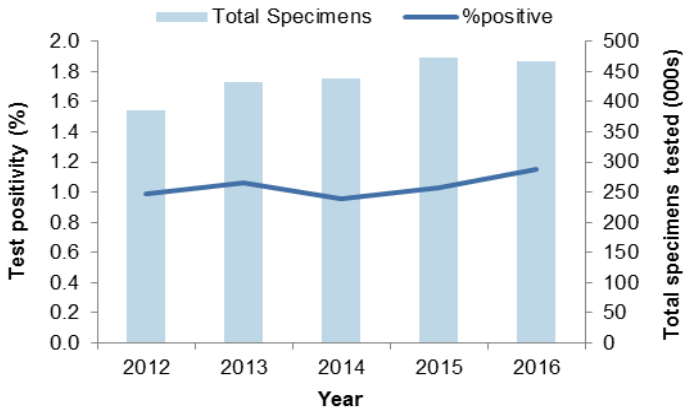
[c] Excludes repeat tests.

[d] Includes unknown sex.

Trends in test positivity

Between 2012 and 2016 test positivity increased slightly from 1.0% to 1.1% (Figure 22). During the same time period the number of specimens tested increased. The test type was recorded for 98.1% of specimens tested in 2016, of which 91.0% were NAATs and the remainder were cultures. There has been an increasing trend in the proportion of NAATs since this information was first available in 2013, increasing from 78% NAAT tests in 2013 to 88.7% in 2015.

Figure 22. Test positivity and total specimens tested for gonorrhoea, 2012–2016



Note: based on data from 17 DHBs in 2012, 19 DHBs in 2013 and 2014, and all DHBs from 2015 onwards.

Ethnicity analysis of test positivity and population testing rates

For both males and females the highest population testing rate was reported in the MELAA ethnic group (Table 35). However, test positivity was highest in the Pacific peoples ethnic group (8.9%) for males and in the Māori ethnic group (1.2%) for females.

Table 35. Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	12865	72199	85093	47	252	152	5.3	1.2	1.8	469	733	1203
Pacific peoples	5633	29390	35029	39	202	121	8.9	1.1	2.3	332	243	575
Asian	8265	36011	44294	35	147	92	3.0	0.2	0.7	159	47	206
MELAA	2412	5890	8305	99	261	177	3.3	0.2	1.1	55	9	64
European or Other	54259	187952	242276	37	124	82	2.5	0.3	0.8	876	362	1238
Unknown	17093	22649	40046	-	-	-	2.9	0.8	1.8	361	167	557
Total	**100527**	**354091**	**455043**	**45**	**152**	**99**	**3.4**	**0.5**	**1.2**	**2252**	**1561**	**3843**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

When further analysed by the highest risk age groups (15–19 years, 20–24 years and 25–29 years) a different pattern of testing rates and test positivity was seen (Table 36 to Table 38). The highest population testing rates occurred in the Māori ethnic group for females in all three age groups and in the Māori (15–19 years), European or Other (20–24 years) and MELAA (25–29 years) ethnic groups for males. In each of these age groups test positivity was highest in the Pacific peoples or Māori ethnic groups for females and in the Pacific peoples ethnic group for males.

Table 36. Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex in the 15–19 years age group, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	2578	15667	18256	96	614	348	6.8	2.4	3.0	131	306	437
Pacific peoples	848	3597	4446	59	256	156	14.9	3.1	5.3	89	90	179
Asian	430	1638	2068	24	100	60	3.0	0.4	1.0	9	7	16
MELAA	129	385	515	71	237	150	5.4	0.0	1.4	3	0	3
European or Other	5326	29040	34381	59	338	194	2.2	0.4	0.7	76	90	166
Unknown	1202	4196	5426	-	-	-	3.6	1.3	1.8	28	53	81
Total	**10513**	**54523**	**65092**	**66**	**361**	**209**	**4.6**	**1.2**	**1.8**	**336**	**546**	**882**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

Table 37. Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex in the 20–24 years' age group, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test positivity (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	3227	18476	21708	131	757	443	6.2	1.3	2.0	137	203	341
Pacific peoples	1650	7692	9343	117	559	336	11.2	1.2	2.9	119	68	187
Asian	1729	5270	7005	62	236	140	4.0	0.2	1.2	44	10	54
MELAA	356	1074	1430	136	525	307	5.3	0.3	1.5	13	3	16
European or Other	13779	50646	64451	141	557	342	2.4	0.3	0.7	215	110	325
Unknown	4219	6785	11061	-	-	-	3.4	0.9	1.8	97	51	148
Total	**24960**	**89943**	**114998**	**140**	**550**	**336**	**3.8**	**0.6**	**1.3**	**625**	**445**	**1071**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

Table 38. Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases by ethnicity and sex in the 25–29 years' age group, 2016

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Test positivity (%)[a,c]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
Māori	2435	13478	15917	127	642	391	5.3	0.8	1.5	93	93	186
Pacific peoples	1113	5946	7062	93	497	295	8.4	0.9	2.1	60	41	101
Asian	2315	8038	10358	75	269	171	3.4	0.1	0.8	51	9	60
MELAA	621	1266	1888	199	455	320	3.7	0.2	1.3	16	2	18
European or Other	10236	32572	42815	114	366	239	3.0	0.2	0.9	179	59	238
Unknown	3747	4630	8411	-	-	-	3.1	0.7	1.8	80	27	107
Total	**20467**	**65930**	**86451**	**123**	**400**	**261**	**3.6**	**0.4**	**1.2**	**479**	**231**	**710**

[a] All counts, rates and percentages exclude Taranaki DHB. [b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests. [d] Includes unknown sex.

Analysis of testing coverage rates (percentage of people tested annually)

Coverage rates were lower than population testing rates for both males and females across the three highest risk age groups. Annual coverage rates for these three high risk age groups were between 4.6 and 8.8% for males and between 21.8 and 34.2% for females (Table 39).

The percentage decrease between population testing rates and coverage rates varied by ethnic group. For males, the Asian and MELAA ethnic groups showed the greatest decrease, especially in the 25–29 years age group with decreases of 52% and 54% respectively. For females, the Māori and Pacific peoples ethnic groups showed the greatest decrease across the age groups, ranging from 40% to 45%. This suggests many cases have been retested at least once.

Table 39. Percentage of gonorrhoea specimens tested that were positive, number of tests per 1000 population, and coverage by ethnicity, age group and sex, 2016

Ethnicity	Age group (years)[a]																	
	15–19						20–24						25–29					
	Specimens tested positive (%)[b]		Total tests per 1000 population		Coverage (%)[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		Coverage (%)[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		Coverage (%)[c]	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Māori	6.8	2.4	96	614	6.9	33.5	6.2	1.3	131	757	8.9	42.9	5.3	0.8	127	624	8.2	37.3
Pacific peoples	14.9	3.1	59	256	3.9	14.8	11.2	1.2	117	559	6.9	31.4	8.4	0.9	93	497	5.7	29.5
Asian	3.0	0.4	24	100	1.4	6.6	4.0	0.2	62	236	3.2	16.0	3.4	0.1	75	269	3.6	19.0
MELAA	5.4	0.0	71	237	3.8	14.1	5.3	0.3	136	525	8.4	33.5	3.7	0.2	199	455	9.1	30.0
European or Other	2.2	0.4	59	338	4.1	20.8	2.4	0.3	141	557	8.9	34.9	3.0	0.2	114	366	6.8	24.9
Unknown	3.6	1.3	-	-	-	-	3.4	0.9	-	-	-	-	3.1	0.7	-	-	-	-
Total	**4.6**	**1.2**	**66**	**361**	**4.6**	**21.8**	**3.8**	**0.6**	**140**	**550**	**8.8**	**34.2**	**3.6**	**0.4**	**123**	**400**	**7.3**	**26.6**

[a] All percentages and rates exclude Taranaki DHB.

[b] Calculated using the number of positive specimens (includes repeat tests).

[c] Unique tests based on NHI and patient ID numbers.

SPECIMEN SITE

2016 analysis

The site from which a specimen was taken was recorded for 97.5% (5230/5362) of positive specimens. The most common site recorded for males was urine (38.7%) and for females was the vagina (35.1%) (Table 40). A total of 5 positive specimens were from the eye, of which 2 specimens were from the 4 reported cases aged less than one year.

Table 40. Percentage of positive gonorrhoea tests by specimen site and sex, 2016

Specimen site	Sex[a]	
	Male	Female
Urethral	17.0	0.3
Vaginal	-	35.1
Cervix	-	16.2
Penile	1.9	-
Anorectal	15.2	1.1
Eye	0.1	0.1
Urine	38.7	6.8
Urogenital[b]	6.0	31.0
Throat	19.1	3.2
Other	0.9	3.6
Unknown	1.1	2.4

[a] Excludes specimens with unknown sex. [b] Pooled specimens from more than one site.

Trends in specimen site

Figure 23 and Figure 24 present the percentage of positive gonorrhoea tests by specimen site for males and females from 2012 to 2016. The trend of increasing urine/decreasing urethral sites in males and increasing urogenital/decreasing cervical and vaginal sites in females has continued, but this is expected due to changes in sampling techniques. In contrast, the observed increase in the proportion of positive tests from the anorectal site and throat in males suggests possible changes in risk behaviours.

Figure 23. Specimen site, as a percentage of all positive gonorrhoea tests in males, 2012–2016

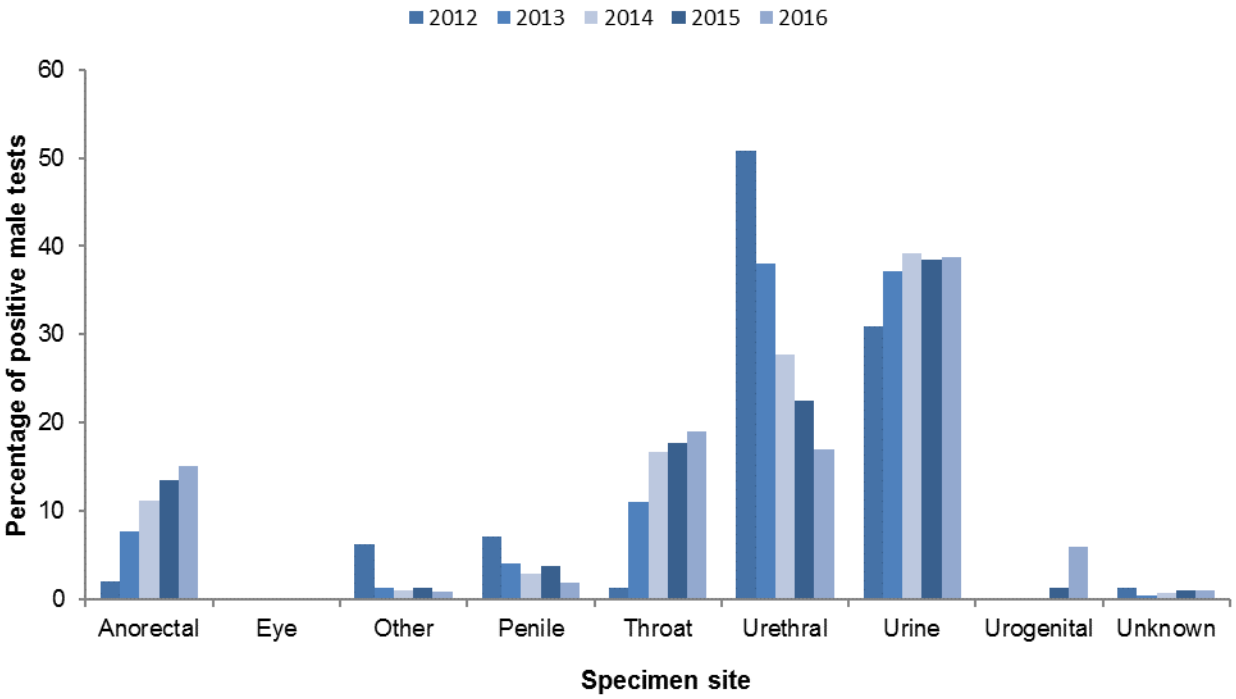
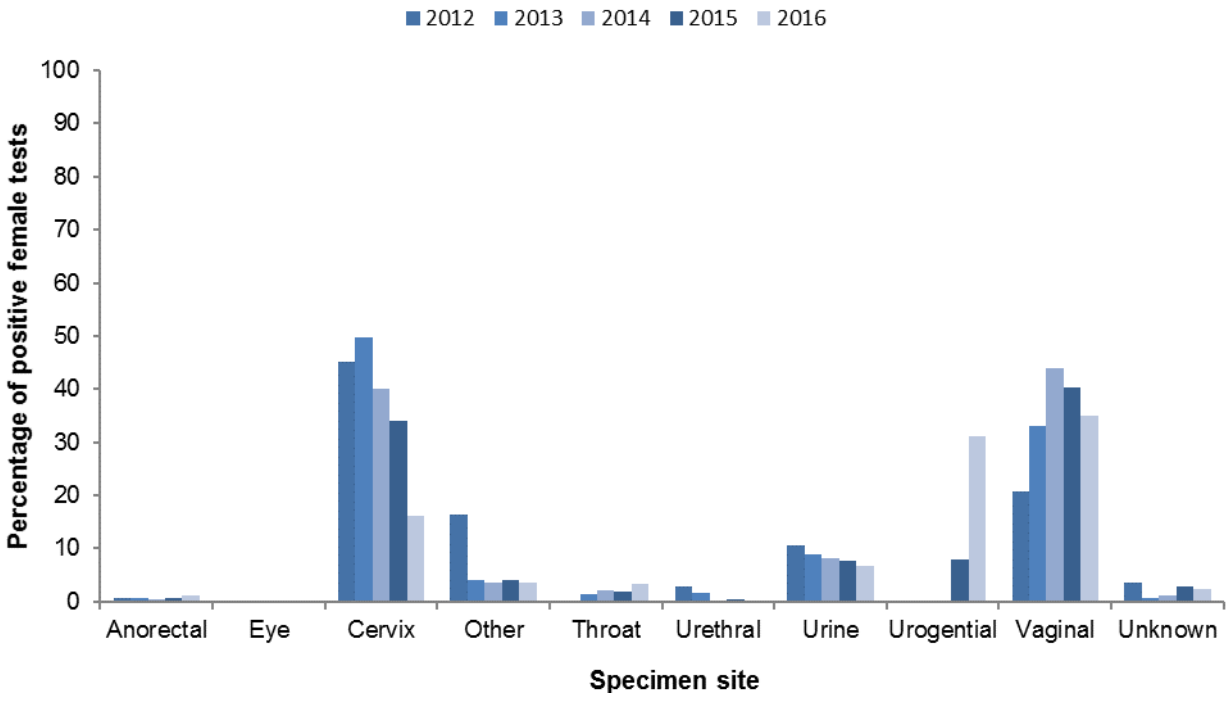


Figure 24. Specimen site, as a percentage of all positive gonorrhoea tests in females, 2012–2016



ANTIBIOTIC RESISTANCE SURVEILLANCE

Dual therapy with ceftriaxone and azithromycin is recommended as the first-line treatment for gonorrhoea in the New Zealand Sexual Health Society Gonorrhoea Guideline [18]. Data on penicillin and ciprofloxacin resistance is also collected and analysed to inform decisions as to whether either antibiotic could be re-introduced into the first line treatment regime.

Data from regions where <30 isolates were tested should be interpreted with caution.

In 2016, 79 isolates, from three DHBs, were reported as being tested for azithromycin resistance. However only one DHB (Canterbury) had more than 30 isolates tested with the prevalence of resistance being 0.0%.

Ceftriaxone resistance (minimum inhibitory concentration (MIC) >0.25 mg/L) has not been detected among *N. gonorrhoeae* in New Zealand to date. However, in 2016 four isolates with decreased susceptibility to ceftriaxone (MICs all 0.064 mg/L) were identified in Waikato (2 cases) and Canterbury (2 cases) DHBs. Isolates with decreased susceptibility have previously been identified in the Auckland regions, and in Waikato and Canterbury DHBs.

In 2016, the prevalence of resistance to penicillin and ciprofloxacin among *N. gonorrhoeae* isolates was 14.9% and 26.2%, respectively. Rates of resistance since 2000 are presented in Figure 25.

Between 2015 and 2016, the number of isolates tested for penicillin resistance decreased, from 198 to 168 isolates, and, for ciprofloxacin resistance, decreased from 944 to 831 isolates. In 2016, two DHBs reported they had tested at least 30 isolates for penicillin resistance and the prevalence of resistance in these DHBs was 2.9% (Waikato), and 19.7% (Canterbury). For ciprofloxacin resistance, five DHBs or regions reported testing at least 30 isolates, of which over 50% (474 isolates) were in the Auckland region. The prevalence of resistance in these ranged from 10.4% in Hawke's Bay to 28.7% in the Auckland region (Table 41).

Figure 25. Prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates, 2000–2016

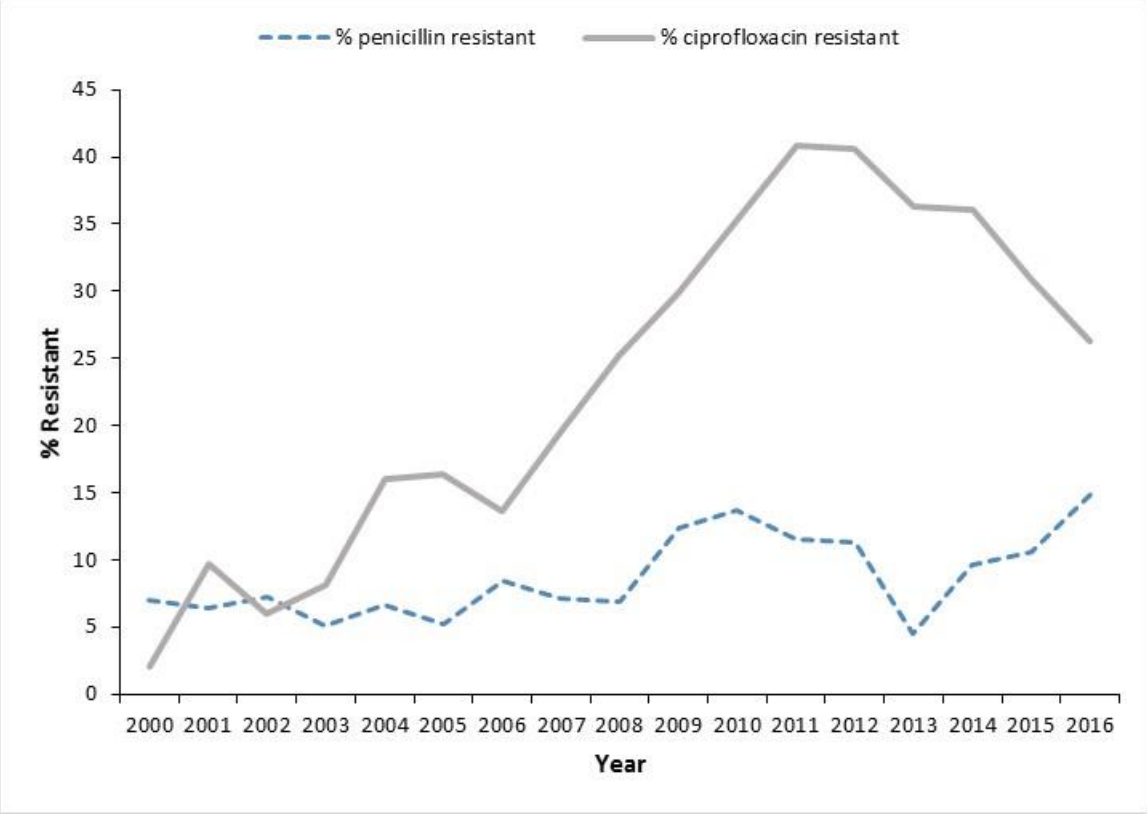


Table 41. Penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates by DHB, 2016

DHB	Penicillin		Ciprofloxacin	
	Number tested	% resistant	Number tested	% resistant
Northland	19	10.5	25	12.0
Auckland region[a]	-	-	474	28.7
Waikato	34	2.9	56	28.6
Lakes	9	11.1	10	60.0
Bay of Plenty	-	-	16	12.5
Tairawhiti	-	-	-	-
Taranaki[b]	8	0.0	8	37.5
Hawke's Bay	-	-	48	10.4
MidCentral/Whanganui	-	-	-	-
Wairarapa	-	-	-	-
Wellington region[c]	7	14.3	31	19.4
Nelson Marlborough	2	0.0	2	50.0
West Coast	-	-	-	-
Canterbury	66	19.7	132	23.5
South Canterbury	-	-	6	50.0
Southern	23	30.4	23	26.1
Total[a]	**168**	**14.9**	**831**	**26.2**

[a] Waitemata, Auckland and Counties Manukau DHBs

[b] Data incomplete for Taranaki DHB

[c] Hutt Valley and Capital & Coast DHBs

CLINIC SURVEILLANCE OF GONORRHOEA

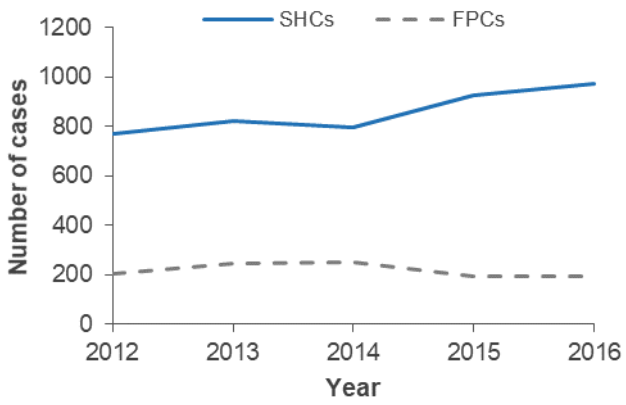
NATIONAL ANALYSIS

Gonorrhoea case numbers reported in 2016 (Table 42) increased in SHCs (971 cases) by 4.6% from 928 in 2015 and decreased in FPCs (194 cases) by 1.0% from 196 in 2015. Since 2012 case numbers have increased in SHCs but have remained relatively stable in FPCs (Figure 26).

Table 42. Gonorrhoea case numbers by clinic type, 2016

Clinic type	Total number of cases
SHC	971
FPC	194
Total	**1165**

Figure 26. Gonorrhoea case numbers by clinic type, 2012–2016



DHB COUNTS

Table 43. Gonorrhoea case numbers by clinic type and DHB, 2016

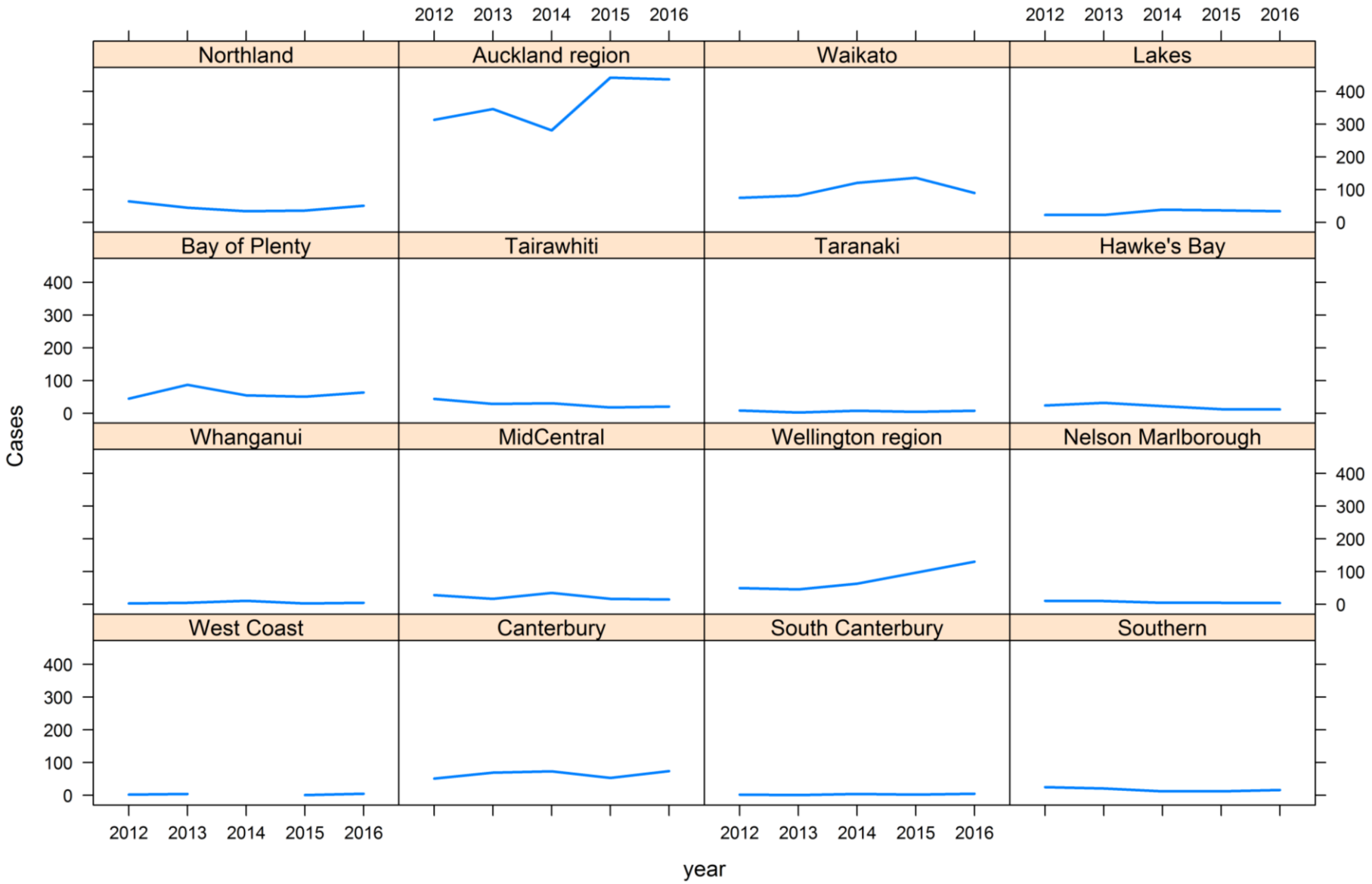
DHB	Clinic type		Total
	SHC	FPC	
Northland	51	10	61
Auckland region[a]	437	76	513
Waikato	90	37	127
Lakes	34	0	34
Bay of Plenty	64	5	69
Tairawhiti	21	23	44
Taranaki	8	1	9
Hawke's Bay	12	0	12
Whanganui	5	4	9
MidCentral	15	0	15
Wellington region[b]	130	13	143
Nelson Marlborough	4	6	10
West Coast	5	0	5
Canterbury	74	6	80
South Canterbury	5	5	10
Southern	16	8	24

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

Variation in trends of cases reported to SHCs by DHB were seen from 2012 to 2016 (Figure 27) with an increase, mostly seen in the main urban centres, including Waikato. These may reflect patterns in clinic attendance.

Figure 27. Gonorrhoea case numbers in SHCs by DHB, 2012–2016



Note: no cases were reported in West Coast DHB in 2014, one case was reported in 2015, and five cases in 2016.

SEX, AGE AND ETHNICITY DISTRIBUTION OF GONORRHOEA CASES

2016 analysis

Sex was recorded for all but two gonorrhoea cases in 2016. More cases of gonorrhoea were reported in males in SHCs and in females in FPCs (Table 44). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2016, the male to female ratio of attendees at FPCs was 1:21) (see Appendix A).

Table 44. Gonorrhoea case by sex and clinic type, 2016

Sex	Clinic type	
	SHC	FPC
Male	729	50
Female	240	144
Total[a]	**971**	**194**

[a] Includes unknown sex.

Age was recorded for all gonorrhoea cases in 2016. A large proportion of the reported cases of gonorrhoea were aged less than 25 years: 39.9% in SHCs and 78.4% in FPCs (Figure 28 and Figure 29).

Figure 28. Gonorrhoea case numbers reported by SHCs by age group and sex, 2016

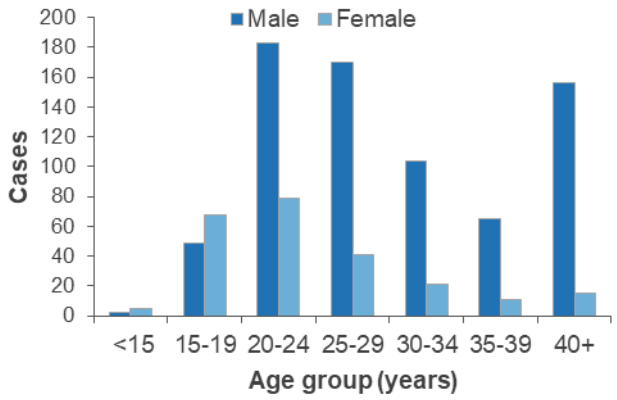
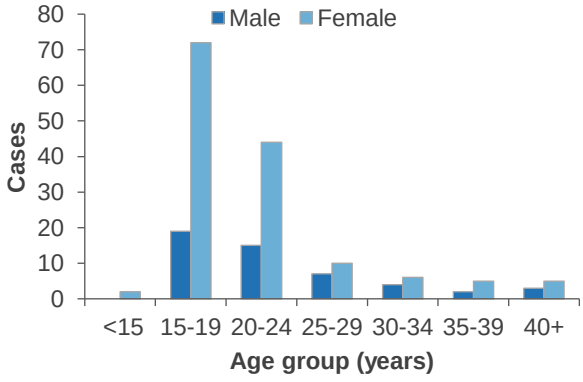


Figure 29. Gonorrhoea case numbers reported by FPCs by age group and sex, 2016



Ethnicity was recorded by SHCs and FPCs for over 98% of gonorrhoea cases. In both SHCs and FPCs the majority of female cases reported Māori ethnicity (60.8% and 45.8%, respectively), whereas

for males, the highest percentage of cases reported European ethnicity (55.1% and 42.0%, respectively). (Table 45).

Table 45. Gonorrhoea cases by ethnicity, sex and clinic setting, 2016

Ethnicity	SHC		FPC	
	Male	Female	Male	Female
European	402	64	21	48
Māori	145	146	17	66
Pacific peoples	52	22	10	24
Other	115	6	1	4
Unknown	15	2	1	2
Total[a]	**729**	**240**	**50**	**144**

[a] Excludes unknown sex and transgender.

Trends in sex, age and ethnicity

Between 2012 and 2016, the number of confirmed gonorrhoea cases diagnosed in both SHCs and FPCs changed slightly or remained stable in most age groups for both males and females. However case numbers diagnosed in FPCs decreased 27% (from 99 to 72 cases) for females in the 15–19 years age group. For males attending SHCs, case numbers increased in those aged over 20 years of age, most notably in the 30-34 years (131%, from 45 to 104 case) and 40 years and over age groups (123%, from 70 to 156 cases) (Figure 30 and Figure 31).

Figure 30. Gonorrhoea cases in SHCs by sex and age group, 2012–2016

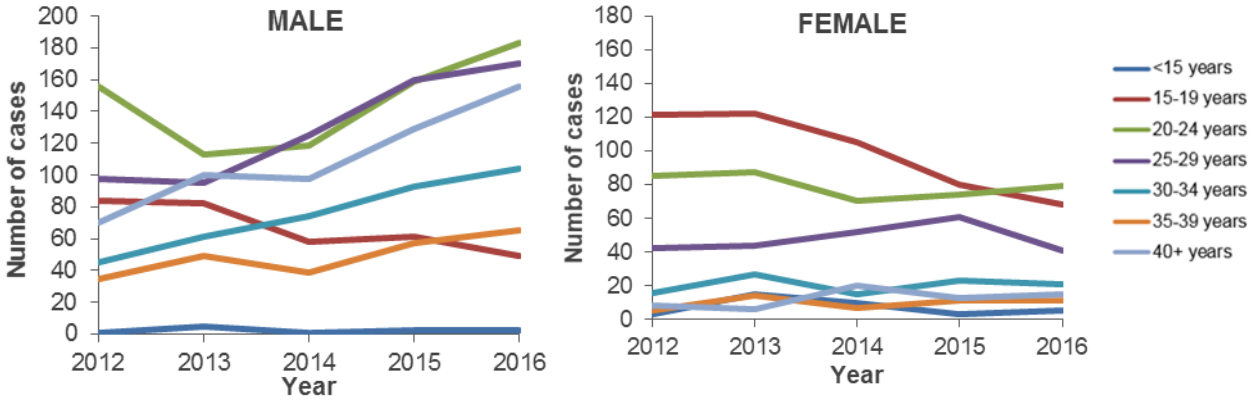
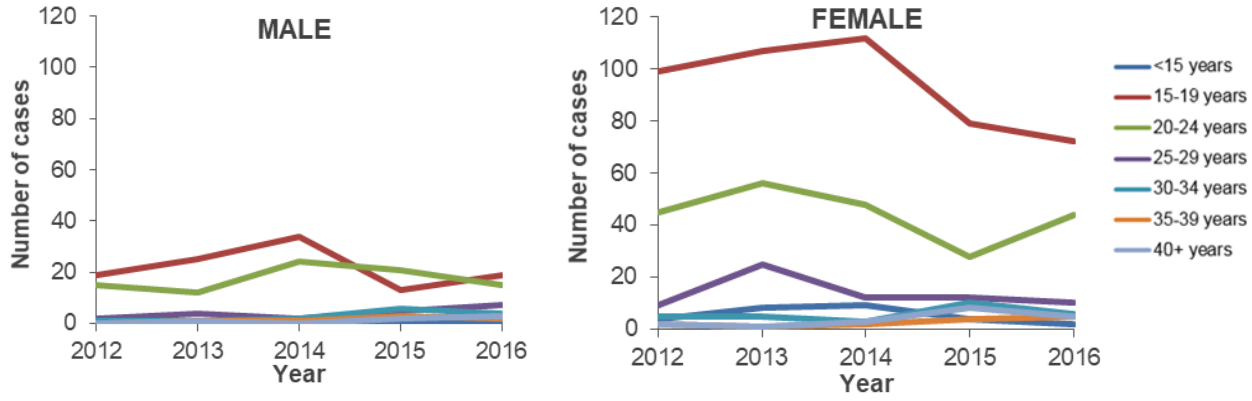


Figure 31. Gonorrhoea cases in FPCs by sex and age group, 2012–2016



In SHCs, there was an increase in the number of gonorrhoea cases diagnosed in the European ethnic group, and a decrease in cases in both Māori and Pacific peoples ethnic groups from 2012 to 2016 (Figure 32). In FPCs, there was a 38% decrease in cases diagnosed in the Māori ethnic group during the period (from 121 to 83 cases) whereas all other ethnicities saw small increases (Figure 33).

Figure 32. Gonorrhoea cases reported from SHCs by ethnicity, 2012–2016

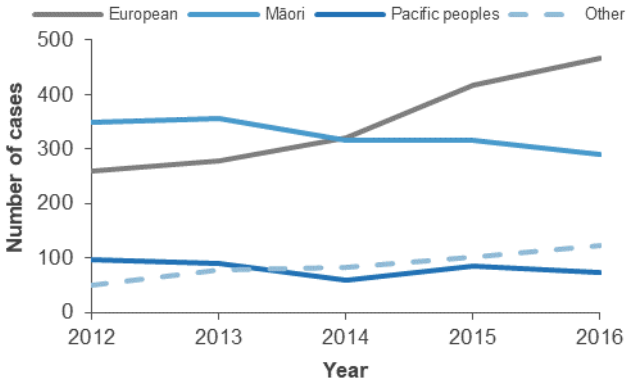
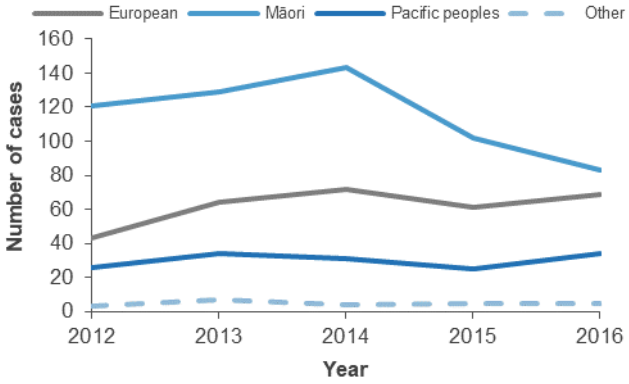


Figure 33. Gonorrhoea cases reported from FPCs by ethnicity, 2012–2016

SITE OF INFECTION



2016 analysis

In 2016, gonorrhoea cases were most commonly confirmed from a sample taken at a urogenital site in both clinic types: 63.1% of SHC cases and 90.7% of FPC cases (Table 46).

Table 46. Gonorrhoea cases by site of infection and clinic setting, 2016

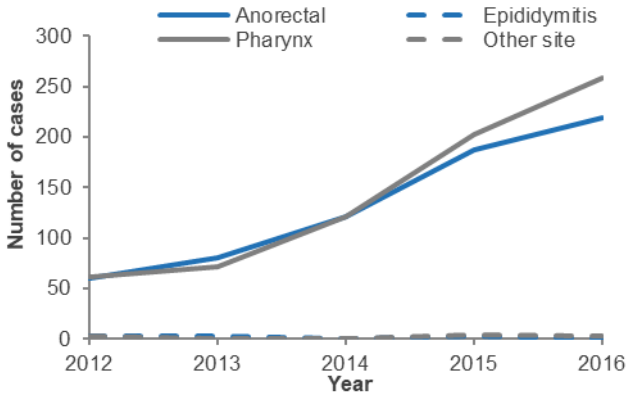
Site	Clinic type	
	SHC	FPC
Urogenital	613	176
Anorectal	232	6
Pelvic inflammatory disease/epididymitis	10	9
Pharynx	274	5
Other site	5	0
Total[a]	**971**	**194**

[a] Cases where the infection was confirmed at more than one site are included in the tally for each site but are only counted once in the total.

Trends in site of infection

From 2012 to 2016, anorectal and pharyngeal gonorrhoea infections in males diagnosed in SHCs increased (from 60 to 219 cases and from 61 to 258 cases, respectively) (Figure 34). Gonorrhoea infections at other sites have remained low. In females, the number of non-complicated non-urogenital gonorrhoea infections were very low from 2012 to 2016, hence trend analysis is not presented.

Figure 34. Site of infection, non-complicated non-urogenital gonorrhoea cases in males in SHCs, 2012–2016



COMPLICATED INFECTIONS

2016 analysis

Complicated infections [epididymitis in males and pelvic inflammatory disease (PID) in females] were reported for 1.0% of gonorrhoea cases in SHCs and 4.6% of cases in FPCs, of which all cases occurred in females in 2016 (Table 47).

Table 47. PID cases reported in females by age group, ethnicity and clinic type, 2016

Ethnicity	SHC			FPC		
	<25 years	25+ years	Total	<25 years	25+ years	Total
European	5	3	8	2	1	3
Māori	1	1	2	5	0	5
Pacific peoples	0	0	0	0	0	0
Other	0	0	0	1	0	1
Unknown	0	0	0	0	0	0
Total	**6**	**4**	**10**	**8**	**1**	**9**

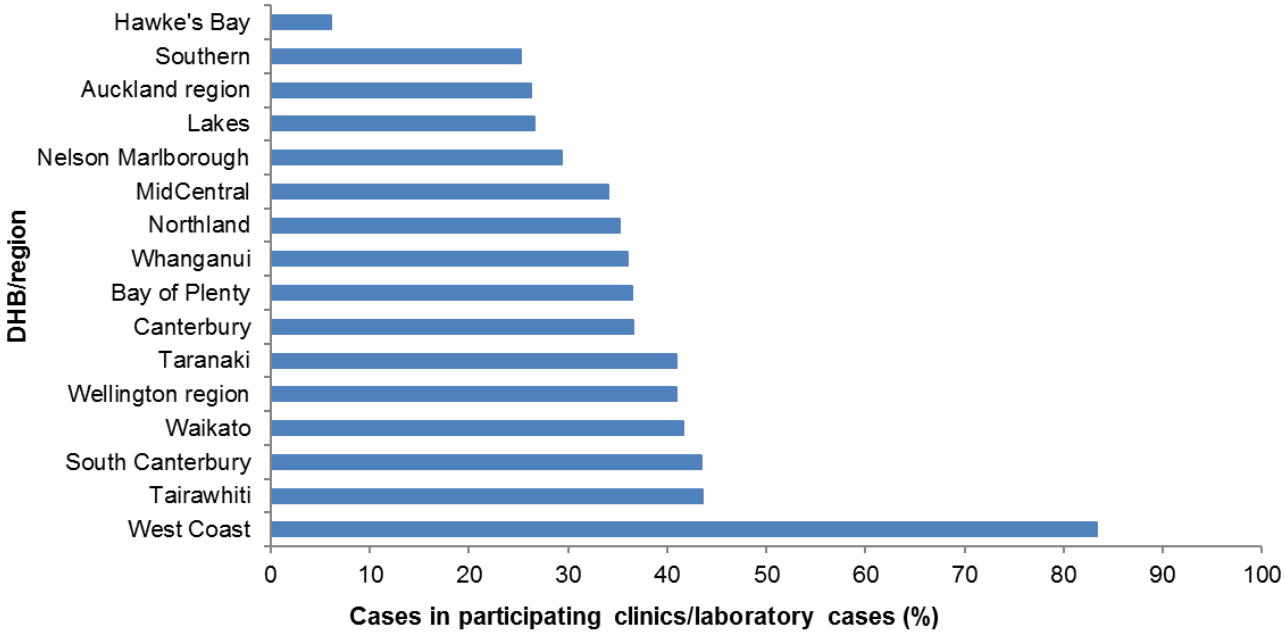
Trends in complicated infections

Case numbers of complicated gonorrhoea infections reported by SHCs were very low for both males and females between 2012 and 2016, hence trend analysis is not presented.

COMPARISON OF LABORATORY AND CLINIC SURVEILLANCE

The number of cases seen in participating clinics (all SHCs and FPCs) as a proportion of laboratory cases are presented in Figure 35. The proportion of cases diagnosed in settings other than a participating clinic ranged from 17% to 94% with an average of 63% nationally. Gonorrhoea cases that were not reported from a SHC or FPC are likely to have been diagnosed in a primary care facility.

Figure 35. Cases of gonorrhoea seen in participating clinics* as a proportion (%) of all positive laboratory tests by DHB, 2016



* All public sexual health and family planning clinics in New Zealand participate in clinic-based STI surveillance.

GENITAL HERPES (FIRST PRESENTATION)

Genital herpes infection is caused by the *Herpes simplex* virus (HSV) types 1 or 2. HSV-2 is traditionally regarded as the primary cause of genital infection and HSV-1 is mainly associated with oral infection. However, HSV-1 has been increasingly associated with genital infection, particularly among younger women [19]. The incidence of HSV-2 found in the Dunedin birth cohort study has been consistently higher in women than men and peaked for women in their early to mid-twenties at 19.1 per 1000 person-years and for men in their late twenties to early thirties at 14.1 per 1000 person-years. The cumulative incidence by age 38 years was 27% for women and 17% for men [20]. However most of these infections were likely asymptomatic or unrecognised and therefore not diagnosed (personal communication, S Azariah, 07 January, 2019).

Symptomatic first infections are associated with anogenital ulcerations and recurrent infections are common. Vaginal delivery in pregnant women with active genital infection carries a higher risk of infection in the foetus or newborn, particularly in a primary infection. Genital herpes can cause severe systemic disease in neonates and in those who are immune suppressed [15]. The ulcerative lesions of HSV facilitate the transmission of HIV infection [21].

KEY FINDINGS: 2016

- In 2016, 1035 first presentations of genital herpes were reported; 739 cases were seen in SHCs and 296 cases in FPCs, a decrease in cases in SHCs from 2016 but an increase in FPCs
- Nationally case numbers have decreased in SHCs but shown a small increase in FPCs from 2012 to 2016 but there is variation across DHBs for the trend data for SHCs with an increasing trend seen in several DHBs, most notably Canterbury DHB
- More cases were reported in females than males across both clinic types
- Since 2012 a decrease has occurred in case numbers reported by SHCs in females aged 15–19, 20–24 and 30–34 years but an increase in females in the 25–29 years age group. Case numbers reported for males in SHCs show a decreasing trend in all age groups. This compares with generally stable numbers in males reported by FPCs (note very low numbers), apart from an increase in the 25–29 years age group, and an increasing trend in females reported by FPCs across all age groups between 15 and 34 years.
- 40.2% of cases reported from SHCs were aged <25 years and 59.1% of cases reported from FPCs were aged <25 years
- The majority of cases reported by both SHCs and FPCs were of European ethnicity (74.4% and 79.0% respectively)

COMMENTARY

Although case numbers of genital herpes have shown a decreasing trend over the past five years this must be interpreted with caution as surveillance is sentinel clinic-based and thus rates are not able to be calculated. Differing patterns between years and clinic types may reflect changes in clinic attendance rather than changes in incidence.

CLINIC SURVEILLANCE OF GENITAL HERPES (FIRST PRESENTATION)

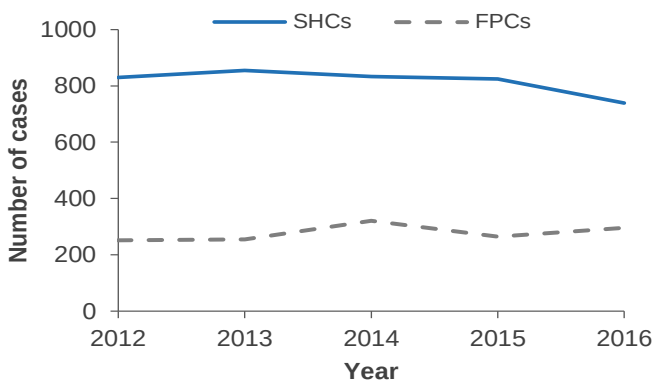
NATIONAL ANALYSIS

Genital herpes case numbers reported in 2016 (Table 48) decreased in SHCs by 10.3% and increased in FPCs by 11.7%, compared with 2015. Since 2012 case numbers have decreased in SHCs and increased in FPCs (Figure 36).

Table 48. Genital herpes (first presentation) case numbers by clinic type, 2016

Clinic type	Total number of cases
SHC	739
FPC	296
Total	**1035**

Figure 36. Genital herpes (first presentation) cases by clinic type, 2012–2016



Routine clinic surveillance methods in New Zealand do not facilitate the collection of data about the type of HSV infection. Therefore, it is not possible to determine if the trends in genital herpes differ by type of viral infection.

DHB COUNTS

Table 49. Genital herpes (first presentation) case numbers by clinic type and DHB, 2016

DHB	Clinic type		Total
	SHC	FPC	
Northland	34	4	38
Auckland region[a]	143	83	226
Waikato	90	26	116
Lakes	22	0	22
Bay of Plenty	58	4	62
Tairawhiti[b]	-	10	10
Taranaki	22	11	33
Hawke's Bay	23	0	23
Whanganui	4	1	5
MidCentral	44	0	44
Wellington region[c]	59	37	96
Nelson Marlborough	29	34	63
West Coast	7	2	9
Canterbury	154	53	207
South Canterbury	5	3	8
Southern	45	28	73

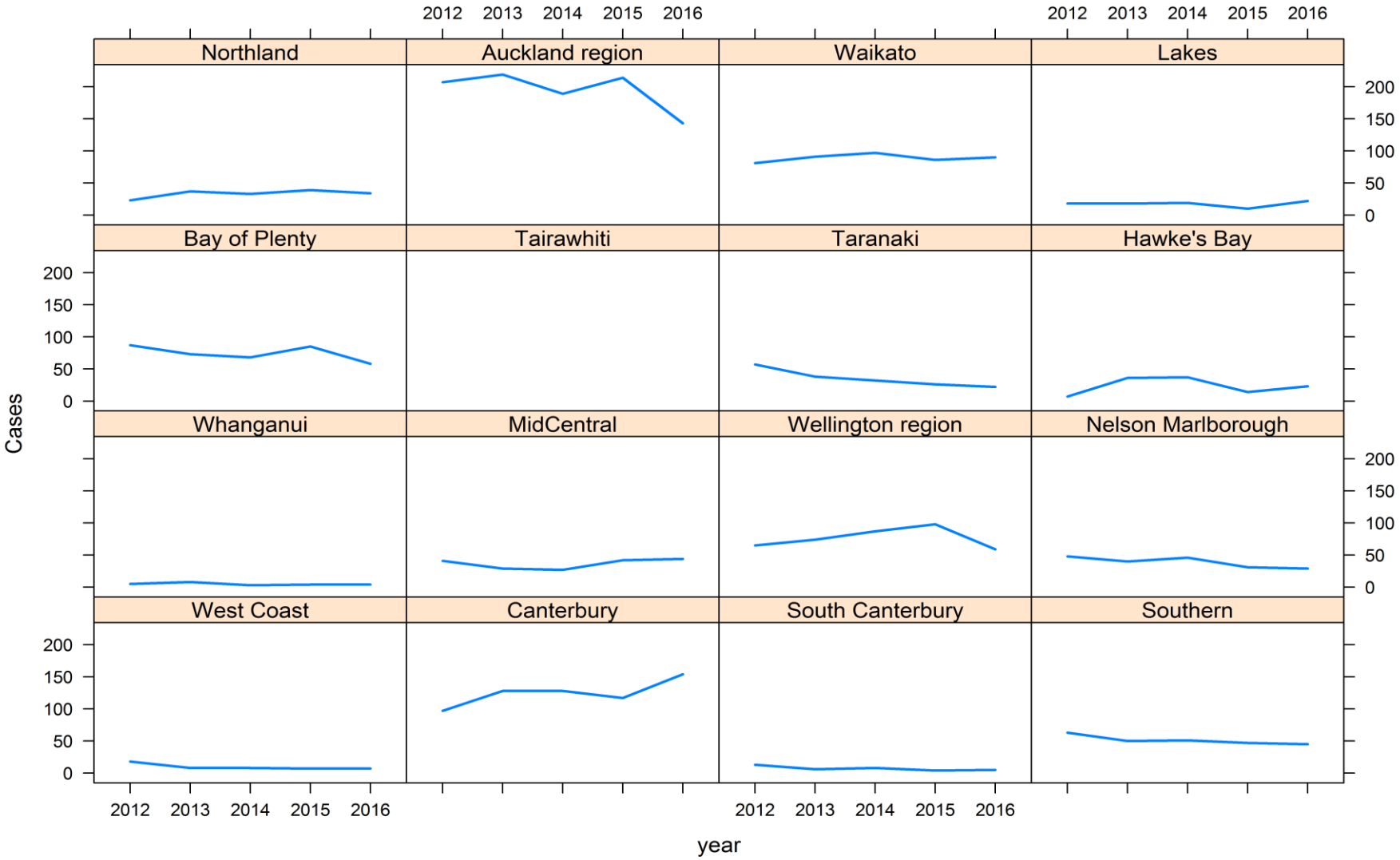
[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] SHC data not available for Tairawhiti DHB.

[c] Hutt Valley and Capital & Coast DHBs.

Variations in trends of case numbers reported to SHCs by DHB were seen from 2012 to 2016 (Figure 37). These may reflect patterns in clinic attendance.

Figure 37. Genital herpes case numbers in SHCs by DHB, 2012–2016



Note: SHC data not available for Tairawhiti DHB.

SEX, AGE AND ETHNICITY DISTRIBUTION OF GENITAL HERPES

2016 analysis

Sex was recorded for all but one case of genital herpes. More cases of genital herpes were reported in females than males across both clinic types (Table 50). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2016, the male to female ratio of visits at FPCs was 1:21) (see Appendix A).

Table 50. Genital herpes (first presentation) cases by sex and clinic type, 2016

Sex	Clinic type	
	SHC	FPC
Male	343	62
Female	396	233
Total[a]	**739**	**296**

[a] Includes unknown sex.

Age was recorded for all cases of genital herpes. A large proportion of the cases of genital herpes were aged less than 25 years: 40.2% in SHCs and 59.1% in FPCs. The mean age of genital herpes cases was 30.2 years in SHCs and 25.3 years in FPCs (Figure 38 and Figure 39).

Figure 38. Number of cases of genital herpes reported by SHCs by age group and sex, 2016

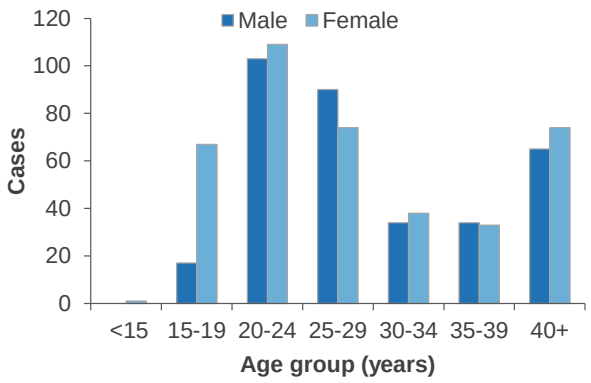
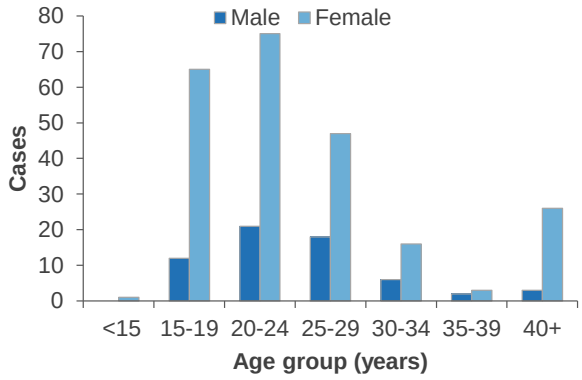


Figure 39. Number of cases of genital herpes reported by FPCs by age group and sex, 2016



Ethnicity was recorded by SHCs and FPCs for over 97% of cases of genital herpes. The highest percentage of cases for both SHCs and FPCs were of European ethnicity (74.4% and 79.0%, respectively), followed by Māori (15.4% and 11.9%, respectively) (Table 51).

Table 51. Genital herpes (first presentation) cases by ethnicity, sex and clinic type, 2016

Ethnicity	SHC		FPC	
	Male	Female	Male	Female
European	252	289	46	179
Māori	44	68	7	27
Pacific peoples	10	8	3	6
Other	28	28	3	14
Unknown	9	3	3	7
Total[a]	**343**	**396**	**62**	**233**

[a] Excludes unknown sex.

Trends in sex, age and ethnicity

Between 2012 and 2016, the trend for the number of case numbers diagnosed in both clinic types varied by age group and sex (Figure 40).

Figure 40. Genital herpes (first presentation) cases in SHCs by sex and age group, 2012–2016

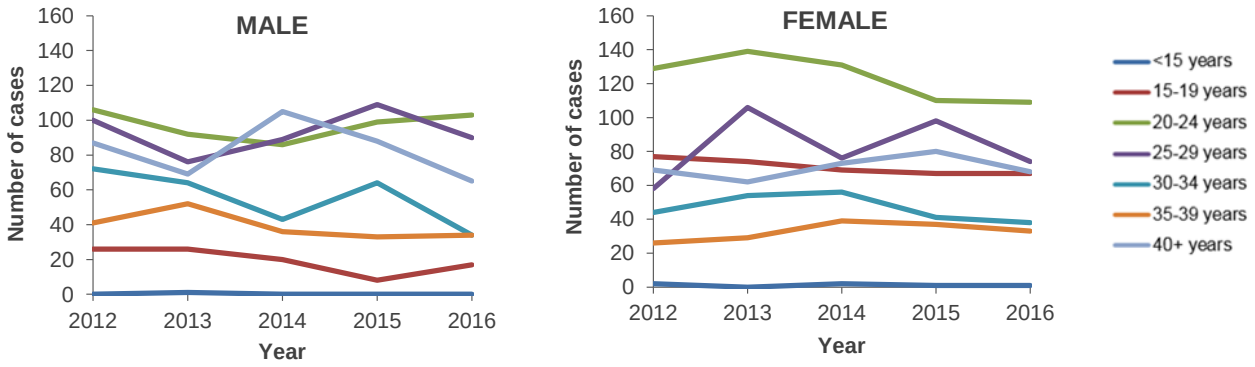
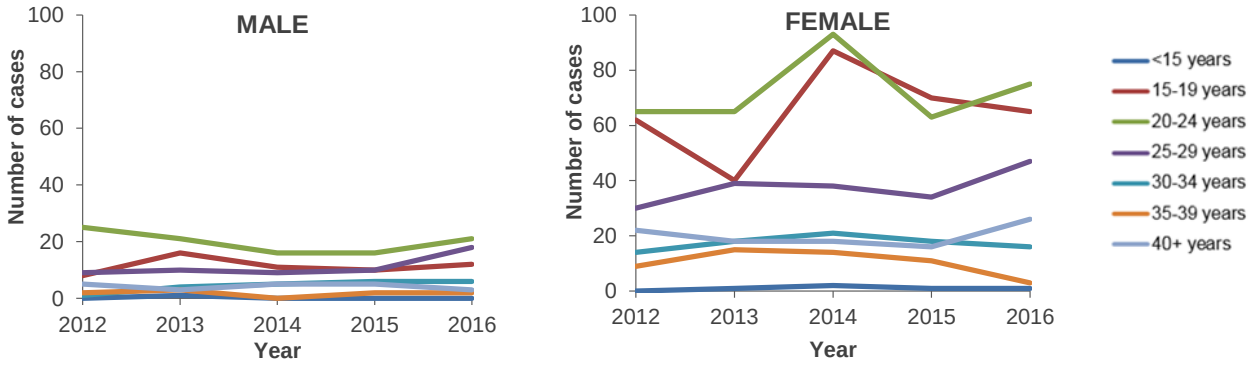


Figure 41. Genital herpes (first presentation) cases in FPCs by sex and age group, 2012–2016



In SHCs there was a decrease in the number of cases diagnosed in all ethnic groups from 2012 to 2016. (Figure 42). This contrasts with a generally increasing or stable trend in case numbers in all ethnic groups in FPCs (Figure 43).

Figure 42. Number of genital herpes (first presentation) cases reported from SHCs by ethnicity, 2012–2016

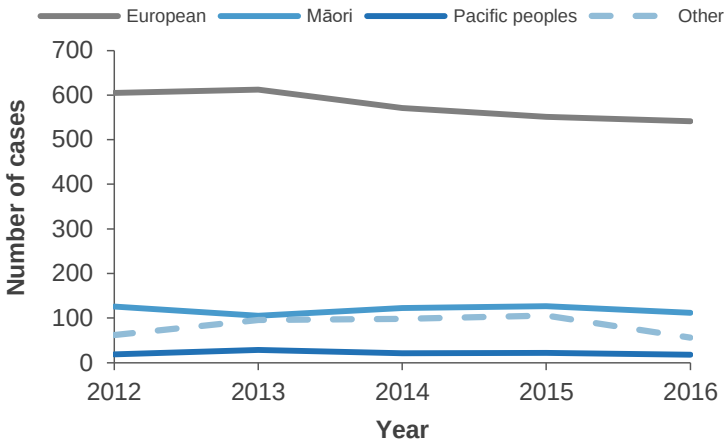
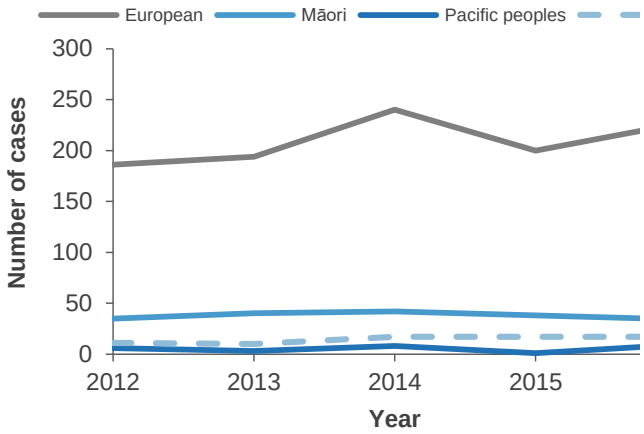


Figure 43. Number of genital herpes (first presentation) cases reported from FPCs by ethnicity, 2012–2016



GENITAL WARTS (FIRST PRESENTATION)

Genital warts, a visible manifestation of human papillomavirus (HPV) infection, are of particular public health importance because of the strong association between some types of HPV (mainly types 16 and 18) and cervical, penile, anal and oropharyngeal cancers. However, approximately 90% of genital warts are caused by HPV types 6 or 11, both of which are considered “low risk” HPV types for developing cancer [22]. In September 2008, an HPV immunisation programme using a quadrivalent vaccine (covering types 6, 11, 16 and 18) commenced for girls born on or after 1 January 1990. This vaccine is now part of the routine immunisation schedule for girls aged 12 years. Changes announced in 2016 but taking effect from 1 January, 2017, will widen access to include males and females aged 9 to 26 years and see replacement of the quadrivalent vaccine with a 9-valent vaccine [23]. Immunisation coverage varies by birth cohort with 49% of women born in 1991 estimated to have received three doses of quadrivalent HPV vaccine compared with 65% of girls born in 2000 as of 31 December, 2017 [24].

KEY FINDINGS: 2016

- 1399 first presentations of genital warts were reported in 2016. Of these, 1201 were seen in SHCs
- From 2015 to 2016 case numbers decreased in SHCs by 20.1% and increased in FPCs by 5.3%
- More cases were reported in males in SHCs and in females in FPCs across both clinic types
- Between 2012–2016 case numbers have decreased in all age groups in SHCs and in those aged <25 years in FPCs
- Decreases in case numbers of >50% were seen in the 15–19 years age group for both clinic types and in the 20–24 years age groups for SHCs from 2012–2016
- Case numbers reported from both clinic types decreased or remained stable in the European, Māori and Pacific peoples ethnic groups from 2012 to 2016

COMMENTARY

The decreasing trend in the number of cases of genital warts reported from both clinic types continued in 2016 and remains most notable in both females and males aged 15–24 years. These decreases follow the introduction of HPV vaccine onto the routine immunisation schedule for girls aged 12 years from late 2008, along with a catch up programme targeting girls born on or after 1 January 1990 [1].The decline in genital warts in the clinic data is consistent with findings from Australia [2].

CLINIC SURVEILLANCE OF GENITAL WARTS (FIRST PRESENTATION)

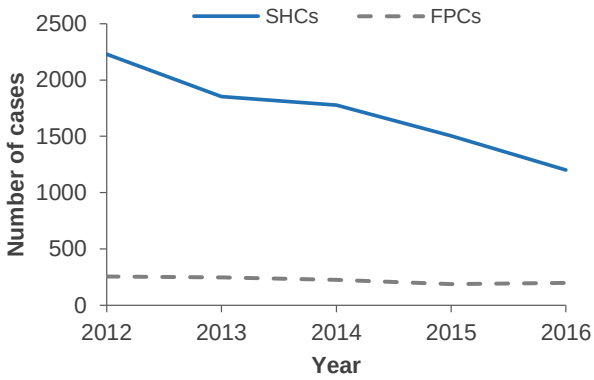
NATIONAL ANALYSIS

In 2016, genital warts was the most commonly reported viral STI in New Zealand. Case numbers reported in 2016 (Table 52) decreased in SHCs by 20.1% and increased in FPCs by 5.3%, compared with 2015. This continued the decreasing trends noted since 2012 (Figure 44).

Table 52. Genital warts (first presentation) case numbers by clinic type, 2016

Clinic type	Total number of cases
SHC	1201
FPC	198
Total	**1399**

Figure 44. Genital warts (first presentation) cases by clinic type, 2012–2016



DHB COUNTS

Table 53. Genital warts (first presentation) case numbers by clinic type and DHB, 2016

DHB	Clinic type		Total
	SHC	FPC	
Northland	6	3	9
Auckland region[a]	370	74	444
Waikato	167	29	196
Lakes	24	0	24
Bay of Plenty	85	3	88
Tairawhiti[b]	-	4	4
Taranaki	43	1	44
Hawke's Bay	23	0	23
Whanganui	6	2	8
MidCentral	35	0	35
Wellington region[c]	145	35	180
Nelson Marlborough	62	8	70
West Coast	13	0	13
Canterbury	152	21	173
South Canterbury	4	3	7
Southern	66	15	81

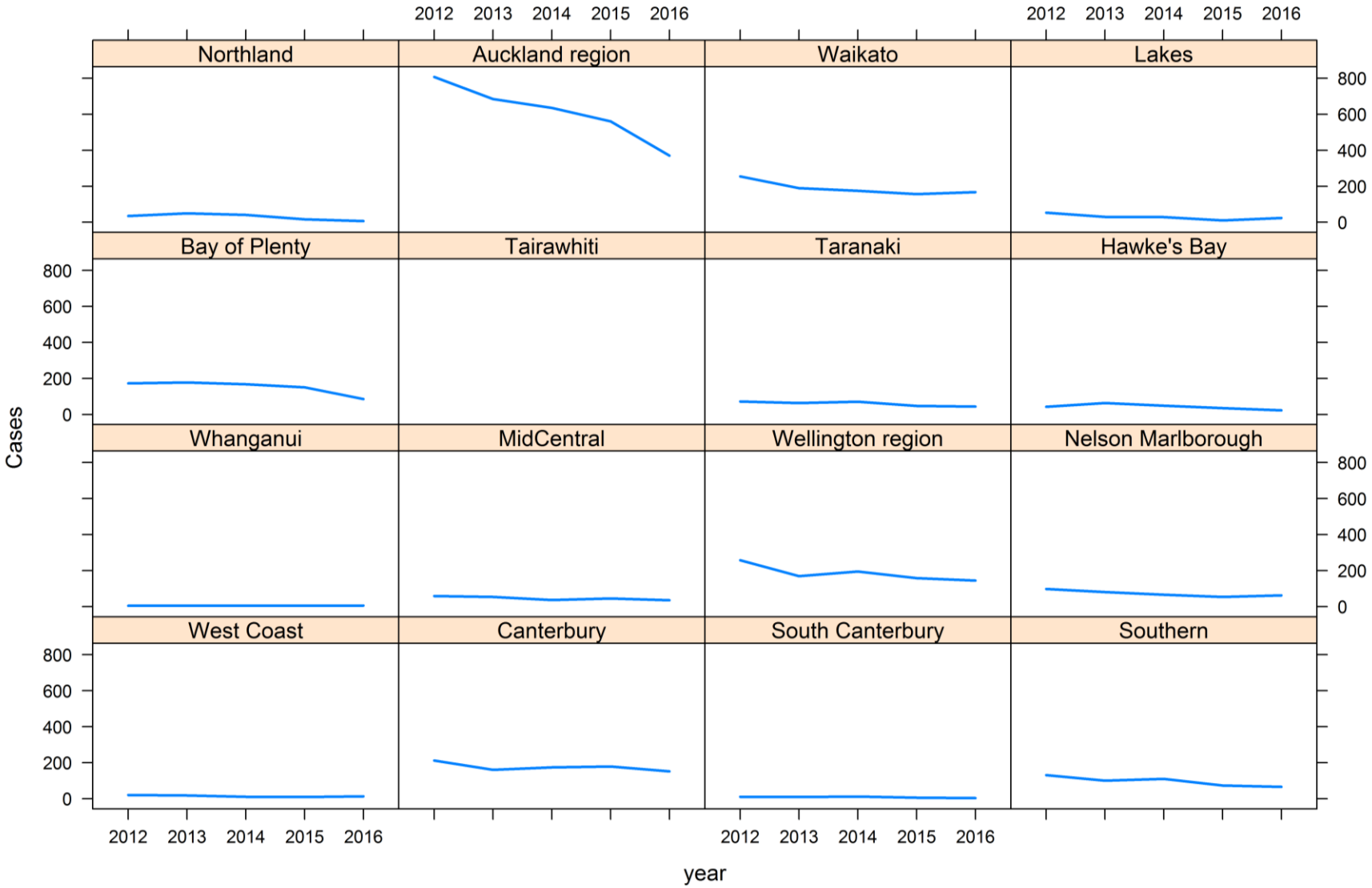
[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] SHC data not available for Tairawhiti DHB.

[c] Hutt Valley and Capital & Coast DHBs.

From 2012 to 2016, SHCs in all DHBs reported a decrease in the number of cases of genital warts (Figure 45).

Figure 45. Genital warts case numbers in SHCs by DHB, 2012–2016



Note: SHC data not available for Tairawhiti DHB.

SEX, AGE AND ETHNICITY DISTRIBUTION OF GENITAL WARTS

2016 analysis

Sex was recorded for all genital warts cases except four. More cases of genital warts were seen in males than females at SHCs (61.1%). By contrast, more cases of genital warts were seen in females than males at FPCs (60.2%) (Table 54). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2016, the male to female ratio of visits at FPCs was 1:21).

Table 54. Genital warts (first presentation) cases by sex and clinic type, 2016

Sex	Clinic type	
	SHC	FPC
Male	733	78
Female	466	118
Total[a]	**1201**	**198**

[a] Includes unknown sex.

Age was recorded for all genital warts cases. The proportion of cases aged less than 25 years was larger in FPCs (57.6%) than in SHCs (34.4%) (Figure 46 and Figure 47).

Figure 46. Number of cases of genital warts reported by SHCs by age group and sex, 2016

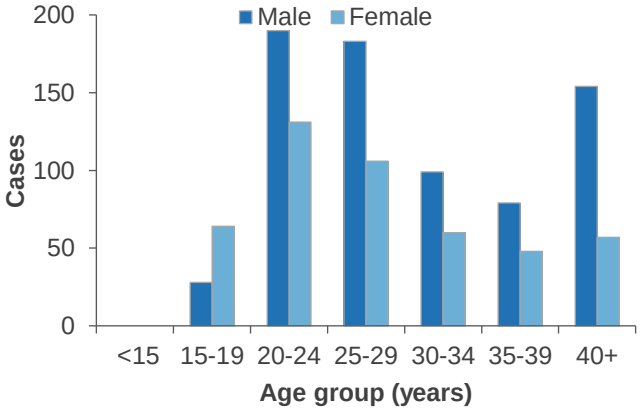
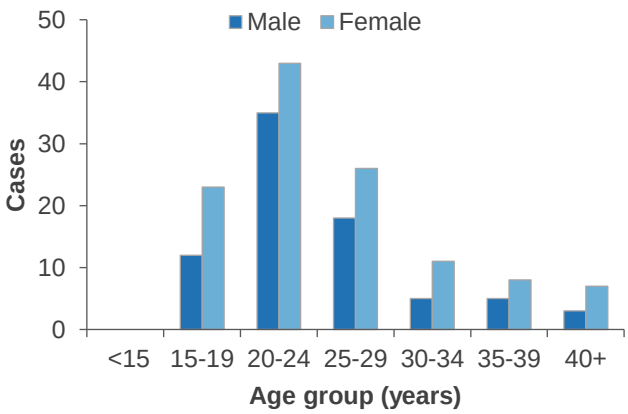


Figure 47. Number of cases of genital warts reported by FPCs by age group and sex, 2016



Ethnicity was recorded by SHCs and FPCs for over 97% of genital warts cases. The highest percentage of cases for both SHCs and FPCs were of European ethnicity (69.3% and 72.6%, respectively) (Table 55).

Table 55. Genital warts (first presentation) cases by ethnicity, sex and clinic type, 2016

Ethnicity	SHC		FPC	
	Male	Female	Male	Female
European	511	297	52	89
Māori	95	79	15	15
Pacific peoples	20	19	4	3
Other	91	55	7	10
Unknown	16	16	0	1
Total[a]	**733**	**466**	**78**	**118**

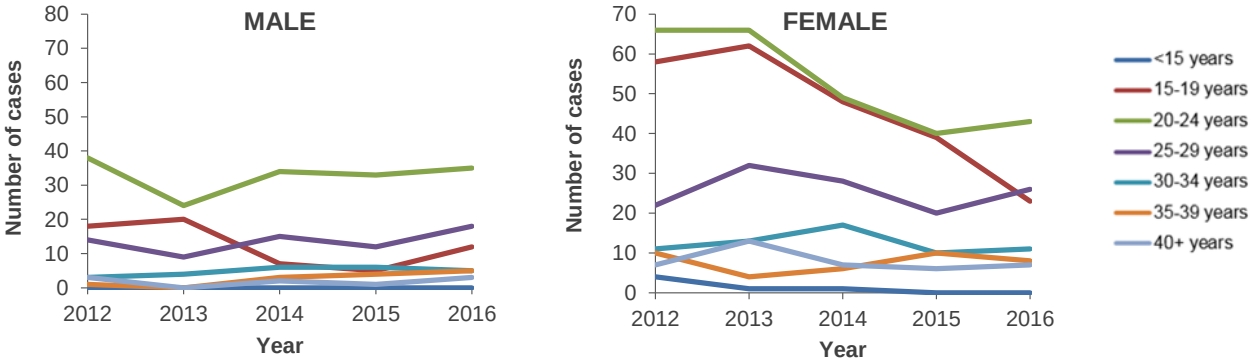
[a] Excludes unknown sex.

Trends in sex, age and ethnicity

Between 2012 and 2016, the number of confirmed genital warts case numbers decreased or remained stable in all age groups in SHCs and in males aged less than 30 years and females all age groups in FPCs. Decreases of greater than 50% were seen in the 15–19 and 20–24 years age groups for SHCs and for females aged 15–19 years in FPCs (Figure 48 and Figure 49).

Figure 48. Number of genital warts (first presentation) cases in SHCs by sex and age group, 2012–2016

Figure 49. Number of genital warts (first presentation) cases in FPCs by sex and age group, 2012–2016



From 2012 to 2016, case numbers of genital warts decreased or remained stable in the European, Māori and Pacific peoples ethnic groups for both clinic types (Figure 50 and Figure 51).

Figure 50. Number of genital warts (first presentation) cases reported from SHCs by ethnicity, 2012–2016

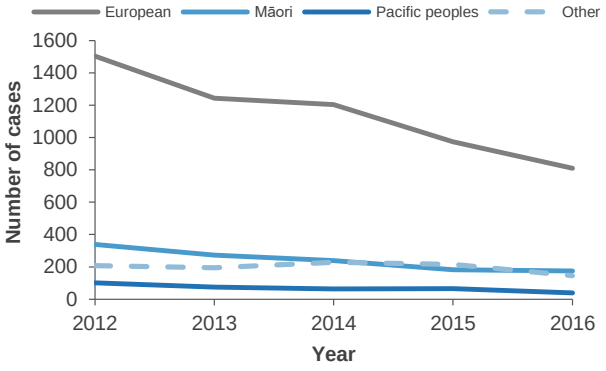
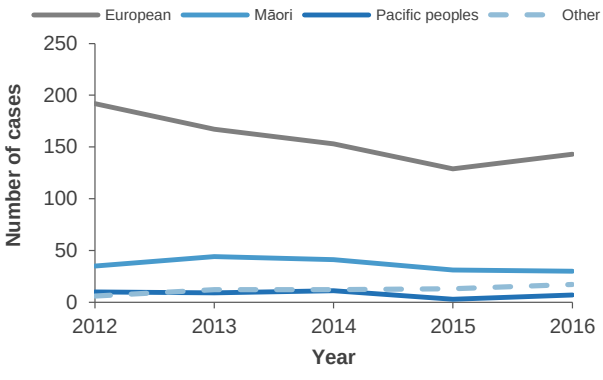


Figure 51. Number of genital warts (first presentation) cases reported from FPCs by ethnicity, 2012–2016



INFECTIOUS SYPHILIS

Syphilis is a serious infection caused by Treponema pallidum with both acute and chronic stages. The first stage of the disease presents as an ulcerative infection that heals spontaneously. If untreated, secondary syphilis will develop in two to eight weeks, and one-third of cases will progress to tertiary syphilis some years later. Transmission most commonly occurs by sexual contact during the first year after infection, but may also occur trans-placentally for at least four years after infection. Untreated syphilis during pregnancy always results in foetal infection and about half of pregnancies affected will end in miscarriage or still-birth. Congenital infections and complications may also occur [25]. Only cases of infectious syphilis (primary, secondary and early latent) are reported by clinics for surveillance purposes.

KEY FINDINGS: 2016

- 325 infectious syphilis cases were reported in 2016, an increase from 2015 (225 cases)
- The majority of cases were reported from the Auckland region (64.0%, 208 cases) and Canterbury DHB (7.7%, 25 cases)
- 90.2% of cases reported by SHCs and FPCs were male
- 321 cases were reported from SHCs; all these cases had enhanced surveillance data provided:
  - 290 cases were male, 6 transgender and 25 female
  - Highest number of cases in males were in the 20–24, 25–29, 30–35 and 35–39 years age groups; the increasing trend across all age groups for males since 2012 is most notable in those aged 25–29 years
  - Of the 290 cases in males, 81.7% (237/290) were reported to be MSM (21 of these bisexual)
  - 24% of cases were reported to be heterosexual, an increase from the 21% reported in 2015
  - 45.6% of MSM cases reported New Zealand European ethnicity, a decrease from 2015 (57.1%). There was a corresponding increase in the proportion of other ethnic groups: Other (18.0%), followed by Asian and Māori (both 15.9%)
  - The most common country of infection was reported to be New Zealand
  - The most common primary reason for testing for both MSM and heterosexuals was clinical symptoms or suspicion, a similar finding to the previous five years
  - 24.2% of MSM cases had a concurrent STI diagnosis, most commonly chlamydia, and 26.8% were HIV seropositive

COMMENTARY

Infectious syphilis in New Zealand continues to be most commonly reported as an infection in MSM with the majority of cases concentrated in areas with large urban populations. However, the increased proportion of cases reported since 2015 that were heterosexual is of concern, as is the changing pattern of ethnicity among cases. Both suggest wider transmission, possibly into groups that have not been seen as high risk and may therefore not be offered asymptomatic screening. The low numbers of cases initially tested as “screening”, especially for females, supports this concern. Strategies to increase awareness amongst clinicians that the recent increase in infectious syphilis was not confined to MSM and promotion of the New Zealand Sexual Health Society STI Guidelines would be useful to address these concerns. Almost a quarter of cases in MSM also had a concurrent STI diagnosis highlighting the importance of comprehensive STI testing, as recommended in the Guidelines.

CLINIC SURVEILLANCE OF INFECTIOUS SYPHILIS

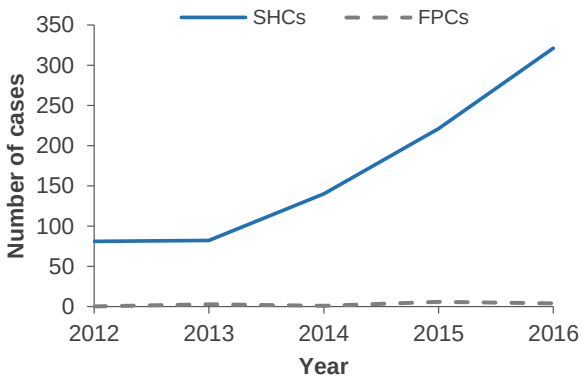
NATIONAL ANALYSIS

Infectious syphilis case numbers reported in 2016 (Table 56) increased in SHCs by 45.2% compared with 2015 (225 cases). Case numbers reported by FPCs decreased slightly from the 6 cases reported in 2015 but remained low (Figure 52).

Table 56. Infectious syphilis case numbers by clinic type, 2016

Clinic type	Total number of cases
SHC	321
FPC	4
Total	**325**

Figure 52. Infectious syphilis case numbers by clinic type, 2012–2016



DHB COUNTS

Table 57. Infectious syphilis case numbers by DHB and sex, 2016

DHB	Cases		
	Male	Female	Transgender
Northland	1	0	0
Auckland region[a]	187	15	6
Waikato	27	4	0
Lakes	8	4	0
Bay of Plenty	8	0	0
Tairawhiti[b]	-	-	-
Taranaki	0	0	0
Hawke's Bay	2	0	0
Whanganui	0	1	0
MidCentral	10	1	0
Wellington region[c]	20	0	0
Nelson Marlborough	2	0	0
West Coast	0	0	0
Canterbury	24	1	0
South Canterbury	0	0	0
Southern	4	0	0
Total	**293**	**26**	**6**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] SHC data not available for Tairawhiti DHB.

[c] Hutt Valley and Capital & Coast DHBs.

Trends in DHB counts

Between 2012 and 2016 SHCs in the Auckland region reported the highest numbers of syphilis cases. Case numbers in the Auckland region increased from 2012 to 2015 (from 33 to 143 cases), and continued to increase in 2016 (208 cases). The number of cases reported in the Wellington region increased between 2012 and 2015 (from 7 to 15 cases), with a further increase in 2016 (20 cases). Case numbers in Waikato increased notably from 2012 to 2016 (from 3 to 31 cases).

SEX, AGE AND ETHNICITY DISTRIBUTION OF SYPHILIS

2016 analysis

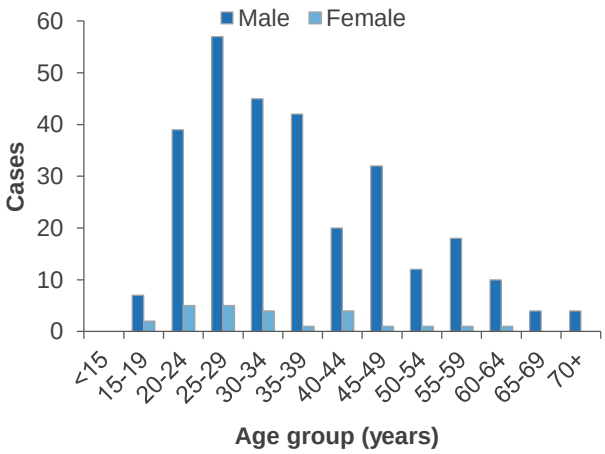
Sex and age were recorded for all cases of infectious syphilis, and the majority (90.2%) were male (Table 58).

Table 58. Infectious syphilis case numbers by sex and clinic type, 2016

Sex	Clinic type	
	SHC	FPC
Male	290	3
Female	25	1
Transgender	6	0
Total	**321**	**4**

In SHCs, a large proportion (83.2%) of the reported syphilis cases were aged 25 years and over, with a mean age of 36.5 years (range: 17–79 years). The number of syphilis cases in SHCs was highest in males aged between 20 and 39 years (183 cases). For females, syphilis case numbers were low and, although spread across the age groups, most cases were aged between 15 and 44 years (Figure 53).

Figure 53. Infectious syphilis case numbers reported by SHCs by age group and sex, 2016



Note: Excludes three transgender cases.

Ethnicity was recorded by SHCs for 99.7% of syphilis cases, and the highest percentage of cases were of European ethnicity (56.3%). In FPCs there was no pattern in the distribution of cases amongst the ethnic groups (Table 59).

Table 59. Infectious syphilis case numbers by ethnicity and clinic type, 2016

Ethnicity	Clinic type	
	SHC	FPC
European	180	2
Māori	53	1
Pacific peoples	24	0
Other	63	1
Unknown	1	0
Total	**321**	**4**

Trends in sex, age and ethnicity

Between 2012 and 2016 syphilis case numbers in SHCs increased in most age groups for males (Figure 54). Case numbers in females attending SHCs were low compared with males and were distributed amongst the age groups.

There were large increases in case numbers in all ethnic groups between 2012 and 2016: Pacific peoples (1 to 24 cases), Other (10 to 63 cases), Māori (10 to 53 cases), and European (55 to 180). However, total cases in the Pacific peoples, Other, and Māori ethnic groups were much lower compared to the case numbers in the European ethnic group (Figure 55).

Figure 54. Number of Infectious syphilis cases in SHCs in males by age group, 2012–2016

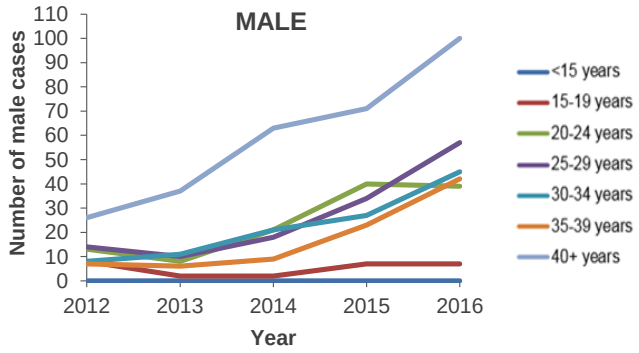
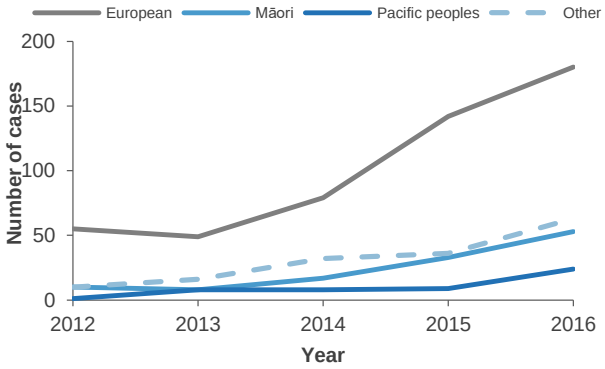


Figure 55. Infectious syphilis case numbers reported from SHCs by ethnicity, 2012–2016



ENHANCED SURVEILLANCE OF INFECTIOUS SYPHILIS

The following analyses are based on data from the enhanced syphilis surveillance. For 2016 this includes all 321 cases reported in the clinic surveillance by SHCs.

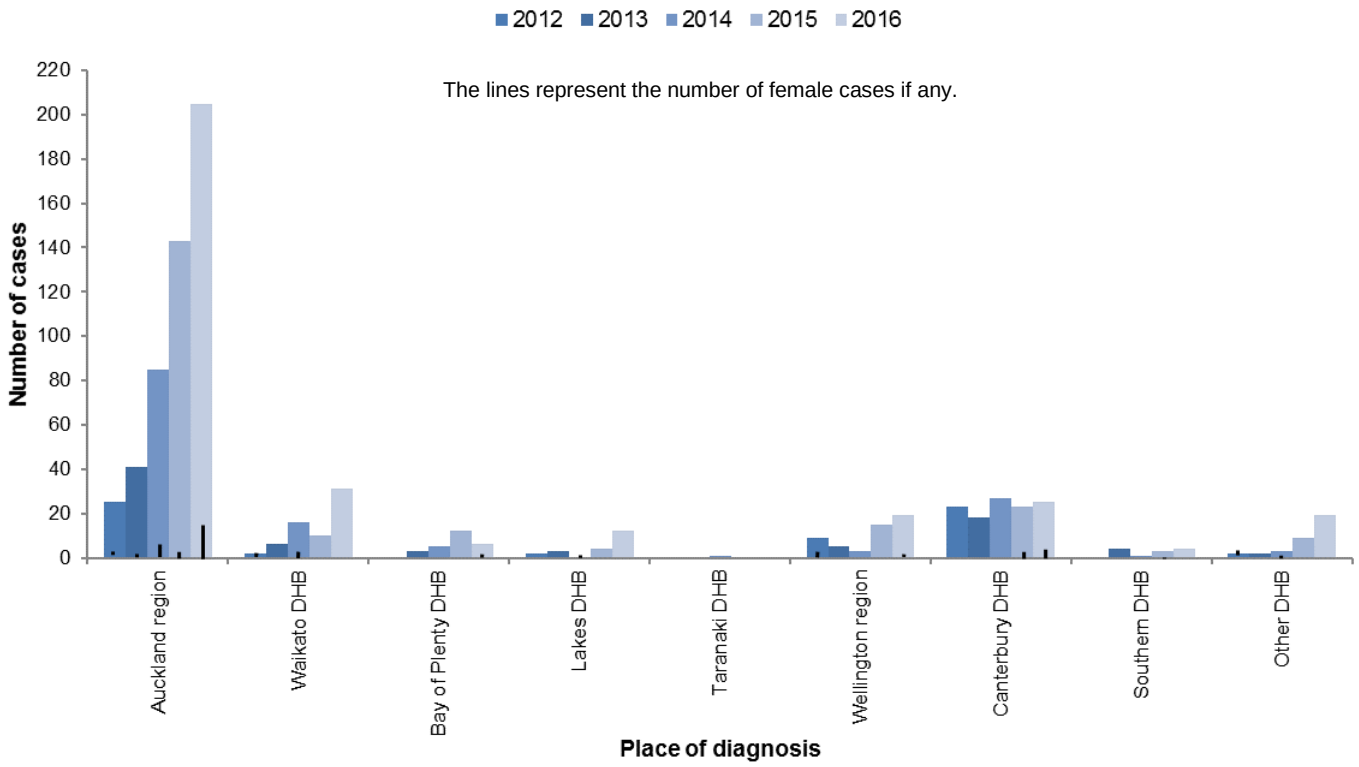
PLACE OF DIAGNOSIS

In 2016, the majority of infectious syphilis cases were diagnosed in the Auckland region (205/321 cases). The 25 female cases reported were diagnosed in the Auckland region (14 cases), Waikato and Lakes DHBs (4 cases each), and Wanganui, Palmerston North, and Canterbury DHBs (1 case each). Six transgender cases were reported and were all diagnosed in the Auckland region.

Trends

From 2012 to 2016 the number of cases reported nationally has increased (from 63 to 321 cases). The greatest increase was seen in the Auckland region (25 to 205 cases), followed by Waikato DHB (2 to 31 cases) and Wellington region (9 to 19 cases). Case numbers in other places of diagnosis have remained more or less stable (Figure 56).

Figure 56. Infectious syphilis case numbers by place of diagnosis, 2012–2016



Note: Based on data from the enhanced syphilis surveillance in which case numbers were matched to clinic data from 2013. Auckland region = Waitemata, Auckland and Counties Manukau DHBs. Wellington region = Hutt Valley and Capital & Coast DHBs.

AGE

2016 analysis

The highest numbers of males with syphilis were reported in the 25–29 years (64 cases), 30–34 years (49 cases), 35–39 years and 20–24 years (44 cases each) age groups. For females, syphilis case numbers were low and were spread across the age groups but with highest case numbers in those aged 20–24 and 25–29 years (5 cases each) and 30–34 and 40–44 years (4 cases each) age groups. The six transgender cases occurred in the 35–39 years (2 cases), <20 years, 25–29 years, 45–49 years and 50–54 years (1 case each) age groups (Table 60).

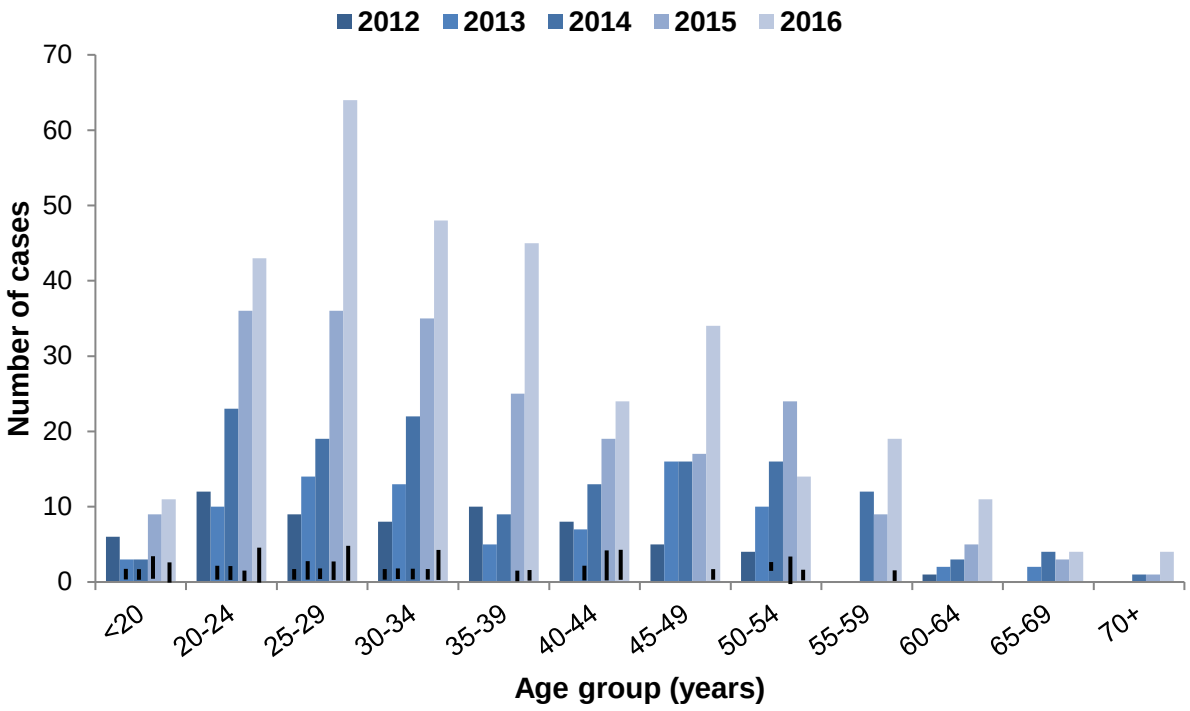
Table 60. Number of infectious syphilis cases by age group and sex, 2016

Age group (years)	Male	Female	Transgender	Total
<20	8	2	1	11
20–24	38	5	0	43
25–29	58	5	1	64
30–34	44	4	0	48
35–39	42	1	2	45
40–44	20	4	0	24
45–49	32	1	1	34
50–54	12	1	1	14
55–59	18	1	0	19
60–64	10	1	0	11
65–59	4	0	0	4
70+	4	0	0	4
Total	**290**	**25**	**6**	**321**

Trends

From 2012 to 2016 case numbers increased in all age groups. The largest increases in case numbers over this period occurred in the 25–29 years age group (9 to 64 cases), followed by the 30–34 years (8 to 48 cases) and 35–39 years (10 to 45 cases) age groups. In the remaining age groups there were more moderate increases or case numbers remained low (Figure 57).

Figure 57. Infectious syphilis case numbers by age group, 2012–2016



SEXUAL BEHAVIOUR

2016 analysis

Sexual behaviour for the 12 months prior to diagnosis was recorded for all but three cases. Of the male cases, 81.7% (237/290) were men who had sex with men (MSM) of whom 21 cases had sex with both men and women. These 21 cases are classified in the MSM group throughout this report. Of the female cases, 96.0% (24/25) were heterosexual and 4.0% (1/25) were females who had sex with males and females (FSMF). Of the transgender cases, three were MSM. The remaining three transgender cases were heterosexual (females who had sex with males) (Table 61).

Table 61. Number of infectious syphilis cases by sexual behaviour and sex, 2016

Sexual behaviour[a]	Male	Female	Transgender	Total
Same sex partners only	216	0	3	219
Opposite sex partners only	50	24	3	77
Both opposite and same sex partners	21	1	0	22
Unknown	3	0	0	3
Total	**290**	**25**	**6**	**321**

[a] Sexual behaviour in the past 12 months.

Trends

From 2012 to 2016 sexual behaviour of cases has remained similar with the majority of cases reported as MSM and most female cases reported as heterosexual. Bisexual females and transgender cases were reported in the surveillance for the first time in 2015. Two male cases in 2012 and three male cases in both 2015 and 2016 were reported with unknown sexual behaviour and therefore are not included in the analyses.

ETHNICITY

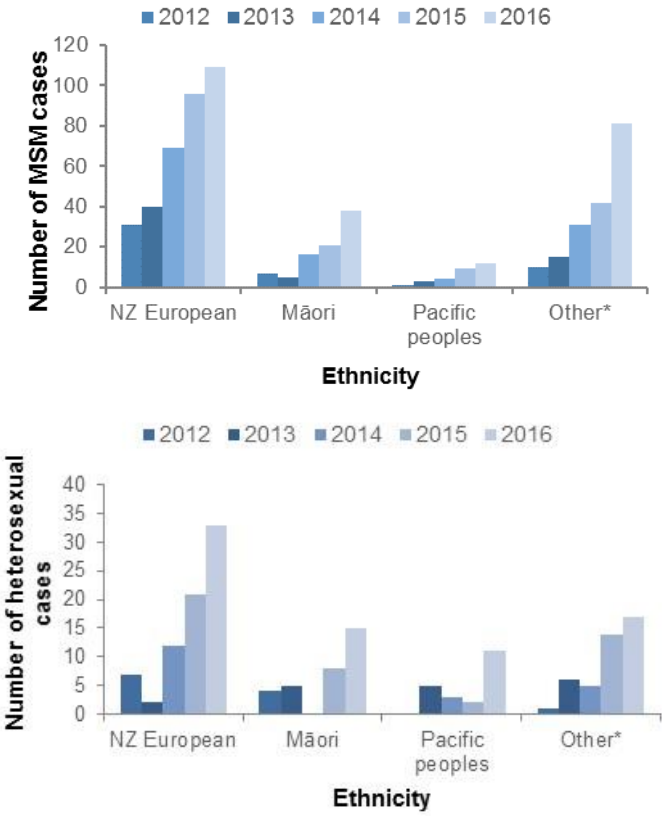
2016 analysis

Ethnicity information was recorded for all cases except for one heterosexual female. The main ethnic group reported for MSM cases was NZ European (45.6%), followed by Other (18.0%), Asian, Māori (15.9%), and Pacific peoples (5.0%) ethnic groups. For heterosexual cases the main ethnic group reported was also NZ European (43.4%), followed by Māori (19.7%), Pacific peoples (14.5%), Other (13.2%) and Asian (9.2%) ethnic groups. The one FSMF case was in the Other ethnic group. For both MSM and heterosexual cases there was no pattern and a wide range of the ethnicities reported under the Other ethnic group (Table 62).

Trends

The most commonly reported ethnic group for MSM cases remained NZ European from 2012 to 2016. In heterosexual cases there was no distinct pattern over the five years. Infectious syphilis cases by ethnicity and sexual behaviour are presented in Figure 58.

Figure 58. Infectious syphilis case numbers by ethnicity and sexual behaviour, 2012–2016



Note: The Asian ethnic group has been combined with the Other ethnic group for these graphs, as in previous years it was not reported separately.

COUNTRY OF INFECTION

2016 analysis

Information on country of infection was recorded for 94.7% (301/318) of cases. Most MSM (85.8%) and heterosexual (85.7%) cases were thought to be infected in New Zealand (Table 62).

Table 62. Number of infectious syphilis cases by sexual behaviour, ethnicity, country of infection and clinical setting of initial syphilis test, 2016

Ethnicity, country of infection and clinical setting	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	FSMF	Total[a]
Ethnicity						
Māori	**38**	**15***	7	5	**0**	**53**
Pacific peoples	**12**	**11**	8	3	**0**	**23**
NZ European	**109**	**33**	23	10	**0**	**142**
Asian	**38**	**7**	6	1	**0**	**45**
Other[b]	**43**	**10**	6	4	**1**	**54**
Unknown	**0**	**1**	0	1	**0**	**1**
Country of infection[c]						
New Zealand	**206*****	**66*****	42	21	**0**	**272**
Australia	**10**	**2**	2	0	**0**	**12**
Other	**10**	**5**	4	1	**1**	**16**
Unknown	**14**	**4**	2	2	**0**	**18**
Clinical setting of initial syphilis test						
Sexual health clinic	**159***	**43*****	31	9	**0**	**202**
General practice	**36****	**23**	16	7	**0**	**60**
Antenatal clinic	**0**	**0**	0	0	**0**	**0**
Family Planning Clinic	**2**	**1**	0	1	**1**	**3**
Student Health Clinic	**0**	**1**	0	1	**0**	**1**
NZ AIDS Foundation Testing clinic	**22**	**0**	0	0	**0**	**22**
Body Positive Testing Clinic	**1**	**0**	0	0	**0**	**1**
Infectious Diseases Clinic	**8**	**0**	0	0	**0**	**8**
Other	**12**	**9**	3	6	**0**	**21**
Total number of cases	**240**	**77**	**237**	**24**	**3**	**318**

[a] Total includes MSM, heterosexual men and women, and FSMF. Total excludes three male cases with unknown sexual behaviour.

[b] Other ethnicities included Afghani, European (USA), European Other, Italian, Latin American, Latin American/Hispanic, Middle Eastern, and Russian.

[c] Some cases had more than one suggested country of infection.

*Includes one transgender case.

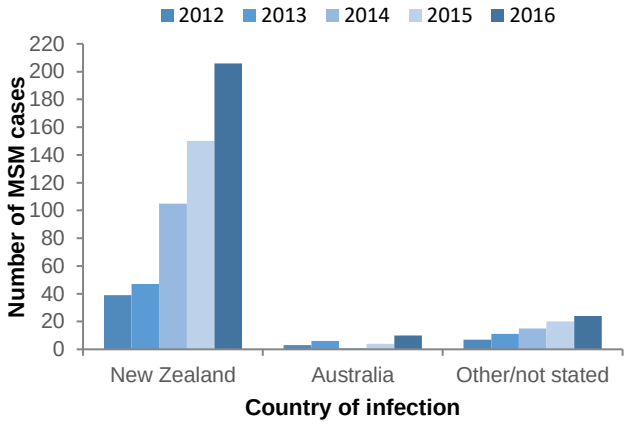
**Includes two transgender cases.

*** Includes three transgender cases

Trends

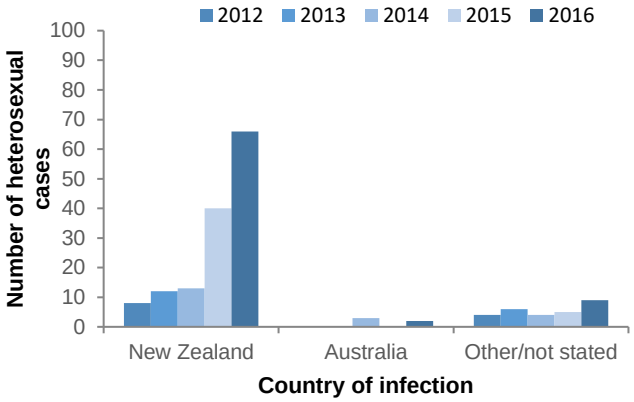
Despite the large increase in case numbers since 2014, the most common country of infection for both MSM and heterosexual cases from 2012 to 2016 remained New Zealand. During the same period, Australia remained the next most common country of infection in MSM, but case numbers were low (Figure 59 and Figure 60).

Figure 59. MSM infectious syphilis case numbers by country of infection, 2012–2016



Note: Other countries of infection reported in 2016 were Brazil, Canada, Colombia, India, Singapore, South Africa, Thailand, the United Kingdom and the United States of America., and 14 cases had unknown country of infection.

Figure 60. Heterosexual infectious syphilis case numbers by country of infection, 2012–2016



Note: In 2016 the other countries of infection were Fiji. Micronesia, Russia, and Thailand and four cases had unknown country of infection.

CLINICAL SETTING OF INITIAL SYPHILIS TEST

2016 analysis

The clinical setting for the initial syphilis test was recorded for all cases (Table 62). Initial testing of MSM cases was most commonly reported in SHCs (159 cases), followed by general practices (36 cases) and NZ AIDS Foundation Testing clinics (22 cases). In heterosexuals both male, female and transgender cases were more likely to have been tested in SHCs (31, 9 and 3 cases respectively) or general practice (16 male and 7 female cases). The site of initial syphilis test for the one FSMF cases was also general practice.

Trends

The clinical settings for initial tests have not changed notably since surveillance started in 2011 apart from an increase in the proportion of MSM cases in 2016 where initial testing was in NZ AIDS Foundation testing clinic.

PRIMARY REASON FOR TESTING

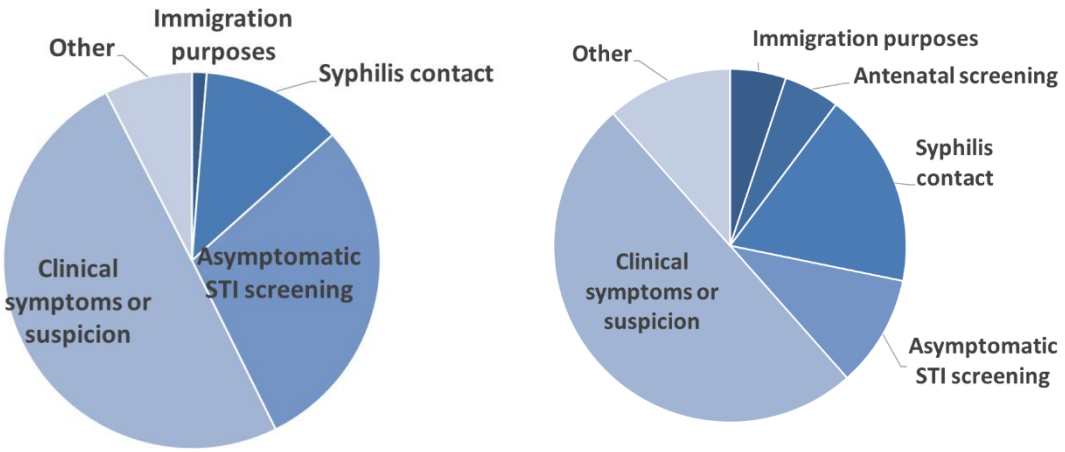
2016 analysis

The primary reason for testing was recorded for all cases (Table 63). The most commonly reported reason for testing in MSM cases was clinical symptoms or suspicion (119 cases), followed by asymptomatic STI screening (70 cases) and syphilis contact (29 cases). In heterosexual male, female and transgender cases the most commonly reported reason for testing was clinical symptoms or suspicion (31, 6 and 2 cases respectively). (Figure 61)

Trends

The most commonly reported primary reason for testing in MSM cases remained clinical symptoms or suspicion between 2012 and 2016 This was also the most commonly reported primary reason for testing in heterosexual men. However, for heterosexual women there was no predominant trend in reason for testing during the same period. There was a small change from 2015 to 2016 in the proportion of MSM cases where the primary reason for testing was reported as asymptomatic screening (from 30% to 29%) whereas there was an increase in the proportion of heterosexual men and women (from 2% to 10%) where asymptomatic screening was reported as the primary reason for testing. However, the low number of cases reported in heterosexuals mean that this increase should be viewed with caution.

Figure 61: Primary reason for testing, 2016



MSM

Heterosexual Males and Females and FSMF

SYMPTOMS

2016 analysis

Symptom information was recorded for all MSM cases, and 63.3% (152/240) reported symptoms. Sixty-four percent (49/77) of heterosexual cases reported symptoms, including 11 females and 2 transgender. The most commonly reported symptoms in both MSM and heterosexual cases were genital ulceration (77 cases and 34 cases respectively) and rash (69 cases and 17 cases respectively) (Table 63).

Trends

The most commonly reported symptoms have continued to be genital ulceration, rash or lymphadenopathy since 2012. Neurological symptoms were not reported prior to 2014 but were reported in two cases in 2014 and three cases in both 2015 and 2016. In earlier years (2012 and 2013) all females were reported to be asymptomatic, but 50.0% (3/6) of female cases were symptomatic in 2014, 76.5% (13/17) in 2015 and 45.8% (11/24) in 2016.

RAPID PLASMA REAGIN (RPR) TITRES

2016 analysis

RPR titre information was recorded for 97.5% (310/318) of cases (Table 63). The most commonly reported titres were 1:32 or 1:64 in MSM (89 cases) and heterosexual cases (35 cases).

Trends

RPR titre information was available for all cases except for one in each of 2012 and 2013, three cases in 2014, four cases in 2015 and eight cases in 2016. From 2012 to 2016 the most commonly reported titres were 1:32 or 1:64. For details see Table 63.

Table 63. Number of infectious syphilis cases by sexual behaviour and primary reason for testing, symptoms, and RPR titres, 2016

Primary reason for testing, Symptoms and RPR titres	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	FSMF	Total
Primary reason for testing						
Clinical symptoms or suspicion	**119***	**39****	31	6	**0**	**158**
Asymptomatic STI screening	**70***	**8***	4	3	**0**	**78**
Syphilis contact	**29***	**14**	7	7	**0**	**43**
Immigration purposes	**3**	**4**	4	0	**0**	**7**
Antenatal screening	**0**	**4**	0	4	**0**	**4**
Other	**19**	**8**	4	4	**1**	**28**
Symptoms						
Genital ulceration	**77****	**34****	27	6	**0**	**111**
Rash	**69**	**17***	7	8	**0**	**86**
Lymphadenopathy	**18**	**8**	6	2	**0**	**26**
Neurological symptoms	**3**	**0**	0	0	**0**	**3**
Oral ulceration	**10**	**4**	1	3	**0**	**14**
Other	**27**	**6**	4	2	**0**	**33**
No symptoms	**88***	**28****	14	13	**1**	**117**
RPR titres						
0	**24**	**3**	2	1	**0**	**27**
1:1, 1:2, 1:4	**41***	**11**	9	2	**0**	**52**
1:8, 1:16	**46***	**16***	12	3	**1**	**63**
1:32, 1:64	**89**	**35***	21	13	**0**	**124**
1:128, 1:256, 1:512	**34**	**10**	5	4	**0**	**44**
Unknown	**6**	**2**	1	1	**0**	**8**
Total number of cases	**240**	**77**	**50**	**24**	**1**	**318**

Total includes MSM, heterosexual men and women, and FSMF. Total excludes three male cases with unknown sexual behaviour.

*Includes one transgender case.

** Includes two transgender cases.

CONCURRENT STI DIAGNOSES

2016 analysis

Fifty-eight (24.2%) MSM cases had a concurrent STI diagnosis, including 15 cases that had two concurrent STI diagnoses. Concurrent STIs included chlamydia (40 cases), gonorrhoea (20 cases), other STIs (6 cases), genital herpes (5 cases) and genital warts (2 cases). Seventeen (22.1%) heterosexual cases had a concurrent chlamydia diagnosis, of which three also had another STI (Table 65).

Trends

Since 2012 the most commonly reported concurrent STI diagnosis in MSM cases has continued to be chlamydia. Chlamydia was also the most commonly reported concurrent STI diagnosis in heterosexuals, but only in very small numbers from 2012 to 2015 (range 0–4 cases each year), followed by a notable increase in 2016 to 17 cases.

HIV SEROSTATUS

2016 analysis

HIV serostatus was recorded for all cases except three. Sixty-four (26.8%) MSM cases were HIV seropositive. All heterosexual cases and both FSMF cases were HIV seronegative (Table 65).

Trends

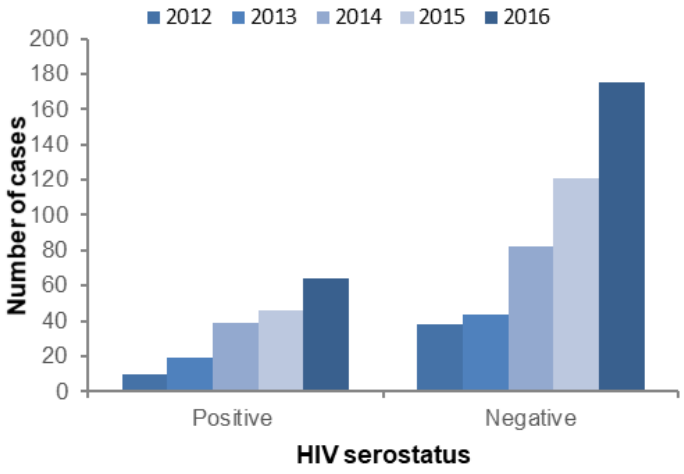
HIV seropositivity for MSM cases steadily rose from 20.8% to 32.2% between 2012 and 2014, but decreased slightly in 2015 and 2016 (Table 64).

Infectious syphilis case numbers by HIV serostatus in MSM are presented in Figure 62 and this shows that the number of seropositive cases for MSM increased sixfold from 2012 to 2016 (10 and 64 cases respectively) and the increase continued between 2015 and 2016. Two heterosexual cases (both male) reported HIV seropositivity in 2012 and 2014 (Table 65).

Table 64. HIV seropositivity in MSM infectious syphilis cases, 2012–2016

Year	2012	2013	2014	2015	2016
% HIV positive	20.8	30.2	32.2	27.5	26.8

Figure 62. MSM infectious syphilis case numbers by HIV serostatus, 2012–2016



Note: MSM cases include men who have sex with only men and also men who have sex with men and women.

Table 65. Number of infectious syphilis cases by sexual behaviour and concurrent STIs and HIV serostatus, 2016

Concurrent bacterial STIs and HIV serostatus	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	FSMF	Total[a]
Concurrent bacterial STIs[b]						
Chlamydia	**40***	**13***	6	6	**0**	**53**
Gonorrhoea	**20***	**2**	2	0	**0**	**22**
Genital warts	**2**	**1**	0	1	**0**	**3**
Trichomoniasis	**0**	**0**	0	0	**0**	**0**
Genital herpes	**5**	**2**	1	1	**0**	**7**
Other	**6**	**2**	2	0	**0**	**8**
HIV Serostatus						
Positive	**64**	**0**	0	0	**0**	**64**
Negative	**175**	**75*****	48	24	**1**	**251**
Unknown	**1**	**2**	2	0	**0**	**3**
Total number of cases	**240**	**77**	**50**	**24**	**1**	**318**

[a] Total includes MSM, heterosexual men and women, and FSMF. Total excludes three male cases with unknown sexual behaviour.

[b] Some cases reported more than one concurrent bacterial STI.

* Includes one transgender case. *** Includes three transgender cases.

SEXUAL ACTIVITY

2016 analysis

For MSM the number of same sex partners in the past three months was recorded for 87.9% (211/240) of cases. The majority (67.3%) of MSM cases had two or more sexual partners in the three months prior to diagnosis (Table 66).

One female case reported having same sex partners in the three months prior to diagnosis.

The number of opposite sex partners in the three months prior to diagnosis was unknown for six cases (Table 66). Twenty-one (8.6%) MSM cases reported having opposite sex partners in the previous three months, of these 11 reported having one partner only. Thirty-eight (49.4%) heterosexual cases reported having only one opposite sex partner in the previous three months.

Of the cases for which information was recorded (306/318) five cases were recorded as being sex workers (4 MSM and 1 heterosexual). Six heterosexual cases reported acquiring the infection through contact with a sex worker. Of these cases the sex workers were reported as female for five cases and was unknown for the remaining case. One FSMF case reported the infection was acquired through contact with a female sex worker (Table 66).

Trends

Between 2012 and 2016 the most commonly reported number of same sex partners in the three months prior to diagnosis in MSM cases has remained 2–4 partners. In heterosexual cases the most commonly reported number of opposite sex partners in the three months prior to diagnosis has remained one partner.

Before 2013 no cases were recorded as being sex workers. Since then the numbers of cases

reported as being sex workers has ranged from two to four (a total of 11 cases who were MSM and 1 heterosexual case). Between 2012–2016 only one MSM case reported acquiring infection from a sex worker (in 2015). Heterosexual cases were reported as acquiring infectious syphilis via female sex workers in 2012 (1 case), 2013 (2 cases), 2014 (1 case), 2015 (4 cases) and 2016 (5 cases).

Table 66. Number of infectious syphilis cases by sexual behaviour and sexual activity and sex work, 2016

Sexual activity and Sex work	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	FSMF	Total
Number of same sex partners in past 3 months						
0	**8**	**-**	-	-	**0**	**8**
1	**61*** **	**-**	-	-	**0**	**61**
2–4	**95**	**-**	-	-	**0**	**95**
5–9	**29**	**-**	-	-	**1**	**30**
10–15	**11**	**-**	-	-	**0**	**11**
16 or more	**7**	**-**	-	-	**0**	**7**
Unknown	**29**	**-**	-	-	**0**	**29**
Number of opposite sex partners in past 3 months						
0	**3**	**8**	6	2	**0**	**11**
1	**11**	**38***	23	14	**1**	**50**
2–4	**2**	**26****	19	5	**0**	**28**
5–9	**0**	**4**	2	2	**0**	**4**
10 or more	**0**	**0**	0	0	**0**	**0**
Unknown	**5**	**1**	0	1	**0**	**6**
Sex work						
Patient was a sex worker						
Yes	**4**	**1***	0	0	**0**	**5**
No	**227*****	**73***	50	22	**1**	**301**
Unknown	**9**	**3***	0	2	**0**	**12**
Acquired through sex worker						
Yes	**0**	**6**	6	0	**1**	**7**
No	**215*****	**62***	38	23	**0**	**277**
Unknown	**25**	**9****	6	1	**0**	**34**
Gender of sex worker						
Male	**0**	**0**	0	0	**0**	**0**
Female	**0**	**5**	5	0	**1**	**6**
Unknown	**0**	**1**	1	0	**0**	**1**
Total number of cases	**240**	**77**	**50**	**24**	**1**	**318**

Total includes MSM, heterosexual men and women, and FSMF. Total excludes three male cases with unknown sexual behaviour.

* Includes one transgender case.

** Includes two transgender cases.

*** Includes three transgender cases.

CONTEXT LEADING TO INFECTION

2016 analysis

The context leading to infection was reported for 188/321 cases (58.6%), some of which reported more than one context. The most commonly reported contexts in MSM cases were Internet-based GPS mobile device apps (54 cases) and Sex-on-site venue (32 cases). Information for heterosexual cases was recorded for only 19 cases (24.7%). Further detail is in Table 67.

Trends

The most commonly reported contexts leading to infection in MSM cases remained the Internet and Sex-on-site venues between 2012 and 2016. However, the marked increase in cases reporting Internet-based GPS mobile device as the context leading to infection first noted in 2015 continued in 2016. For the majority of heterosexual cases information on context was not provided.

Table 67. Number of infectious syphilis cases by sexual behaviour and context leading to infection, 2016

Context leading to infection[a]	MSM[b]	Heterosexual men and women			FSMF	Total[b]
			Heterosexual men	Heterosexual women[c]		
Sex-on-site venue	**32**	**1**	1	0	**1**	**34**
Internet-based GPS mobile device app	**54**	**3**	3	0	**0**	**57**
Internet dating	**11***	**5**	2	3	**0**	**16**
Bar	**17**	**3**	3	0	**0**	**20**
Beat	**2**	**1***	0	0	**0**	**3**
Other	**22**	**6**	6	0	**0**	**28**
Unknown	**74***	**27****	17	8	**0**	**101**
Not stated	**19***	**15**	**7**	**8**	**0**	**34**

[a] Some cases reported more than one context leading to infection.

[b] Total includes MSM, heterosexual men and women, and FSMF. Total excludes three male cases with unknown sexual behaviour

* Includes one transgender case.

** Includes two transgender cases.

OTHER STIs

NON-SPECIFIC URETHRITIS

Non-specific urethritis (NSU) is reported in males only and is defined as the presence of a urethral discharge where a laboratory-confirmed or probable diagnosis of chlamydia or gonorrhoea has been excluded.

LYMPHOGRANULOMA VENEREUM

Lymphogranuloma venereum (LGV) is a bacterial STI caused by *Chlamydia trachomatis.* It is caused by different serovars (L1, L2 and L3) than those that cause chlamydial urogenital infections. LGV is endemic in developing countries and in New Zealand, as in most developed countries, infection is uncommon and usually acquired outside of the country. There have been recent outbreaks of infection amongst men who have sex with men (MSM) overseas as well as cases reported in MSM in New Zealand [26] [27].

CHANCROID

Chancroid is caused by *Haemophilus ducrey*i. It is rare in New Zealand and cases are most probably related to foreign travel. It remains common in many countries in Africa, the Caribbean basin and Southwest Asia. It is more commonly seen in heterosexual men than in women, particularly in uncircumcised males [28].

GRANULOMA INGUINALE

Granuloma inguinale (GI) is a sexually transmitted infection (STI) caused by the bacteria Calymmatobacterium or Klebsiella granulomatis. Also known as Donovanosis the infection is most commonly found in tropical or subtropical areas of the world (such as Papua New Guinea, central Australia, Southern India and the Caribbean). It is rare in New Zealand and cases are most probably related to foreign travel [29].

KEY FINDINGS: 2016

- 649 cases of NSU were reported in 2015, the majority in SHCs (623 cases)
- 27.8% of cases in SHCs were aged <25 years
- The number of NSU cases reported by SHCs decreased by 4.4% between 2012 to 2016, whereas case counts increased in FPCs but remained low (26 cases in 2016)
- No cases of lymphogranuloma venereum (LGV), chancroid or granuloma inguinale (GI) were reported in 2016

COMMENTARY

The increasing national trend in NSU cases noted in the 2015 report that was driven by increasing case numbers in Auckland and Wellington regions and Canterbury DHB has not persisted. This contrasts with the ongoing trend of increasing gonorrhoea and infectious syphilis cases in those areas.

CLINIC SURVEILLANCE OF NON-SPECIFIC URETHRITIS

NATIONAL ANALYSIS

NSU case numbers for 2016 (Table 68) decreased in SHCs by 14.1% compared with 2015 and remained the same in FPCs at 26 cases. From 2012 to 2016, NSU case counts decreased by 4.4% in SHCs, and case counts in FPCs have increased over the five-year period but have remained low (Figure 63).

Table 68. NSU case numbers by clinic type, 2016

Clinic type	Total number of cases
SHC	623
FPC	26
Total	**649**

DHB COUNTS

Table 69. NSU case numbers in SHCs by DHB, 2016

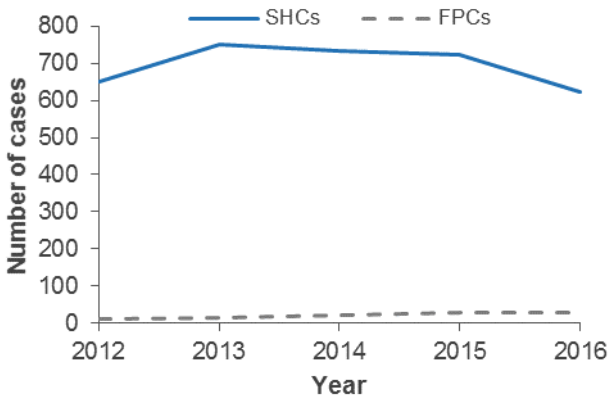
DHB	Cases
Northland	0
Auckland region[a]	291
Waikato	91
Lakes	3
Bay of Plenty	26
Tairawhiti[b]	-
Taranaki	11
Hawke's Bay	0
Whanganui	0
MidCentral	4
Wellington region[c]	76
Nelson Marlborough	28
West Coast	1
Canterbury	79
South Canterbury	0
Southern	13

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] SHC data not available for Tairawhiti DHB.

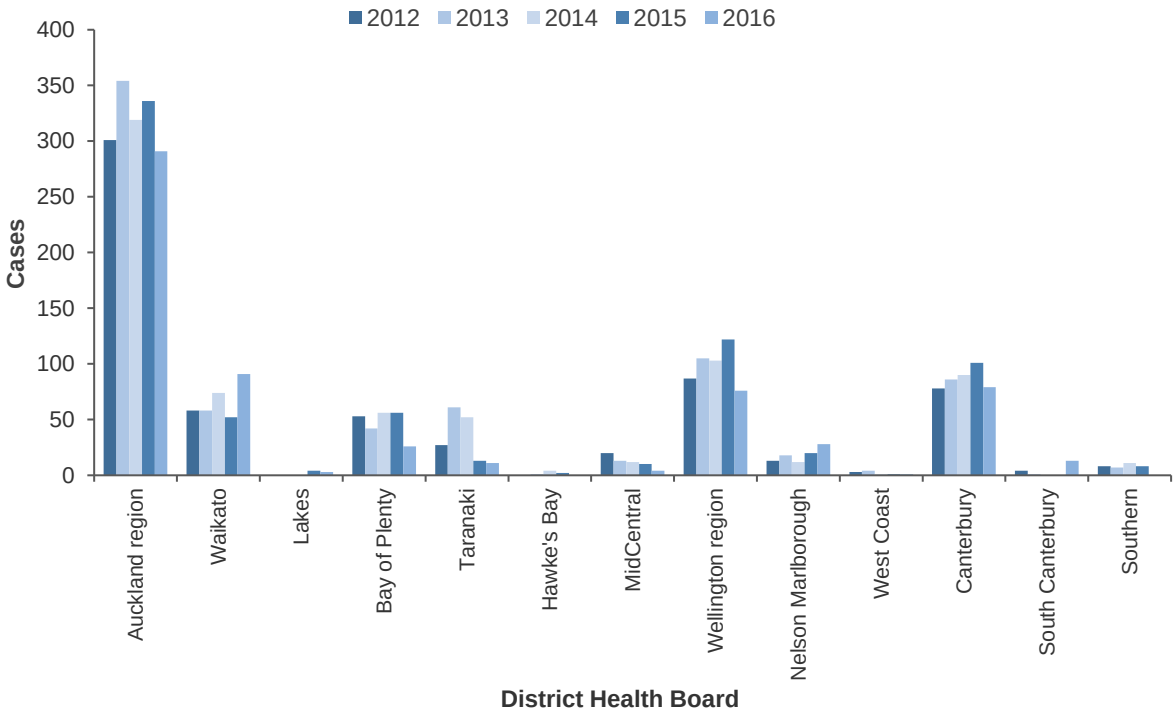
[c] Hutt Valley and Capital & Coast DHBs.

Figure 63. NSU cases by clinic type, 2012–2016



Variations in trends of case numbers reported to SHCs by DHB were seen from 2012 to 2016. The previously noted increasing trend (2011 to 2015) in Auckland and Wellington regions and Canterbury DHB has not continued (Figure 64).

Figure 64. NSU cases reported by SHCs by DHB, 2012–2016



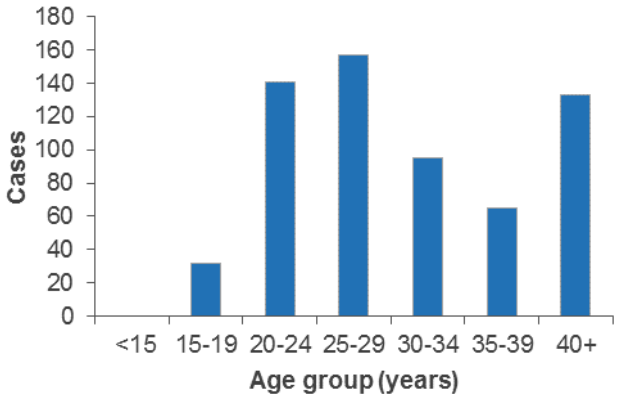
Note: Auckland region is comprised of Waitemata, Counties Manukau and Auckland DHBs. Wellington region is comprised of Hutt Valley and Capital & Coast DHBs. No NSU cases were reported in Northland and Whanganui DHBs over the five-year period. SHC data not available for Tairawhiti DHB.

AGE AND ETHNICITY DISTRIBUTION OF NSU

2016 analysis

Age was recorded for all NSU cases in 2016. In SHCs, 27.8% of the reported cases were aged less than 25 years (Figure 65). The proportion was larger in FPCs (46.2%).

Figure 65. NSU case numbers reported by SHCs by age group, 2016



In SHCs, ethnicity was recorded for 98.6% of the reported cases of NSU. Of these the highest percentage of cases were of European ethnicity (69.1%), followed by Māori (14.0%) (Table 70).

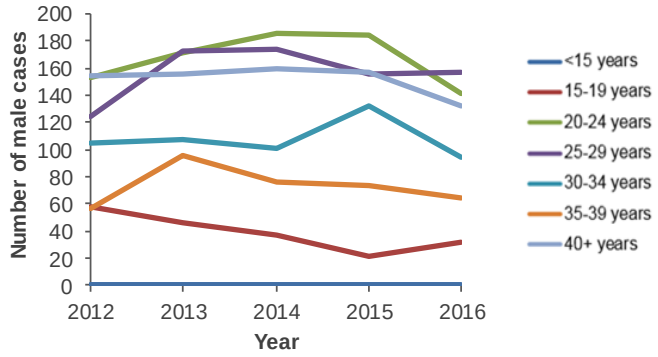
Table 70. NSU cases numbers by ethnicity and clinic type, 2016

Ethnicity	Clinic type	
	SHC	FPC
European	424	21
Māori	86	1
Pacific peoples	24	2
Other	80	0
Unknown	9	2
Total	**623**	**26**

Trends in age and ethnicity

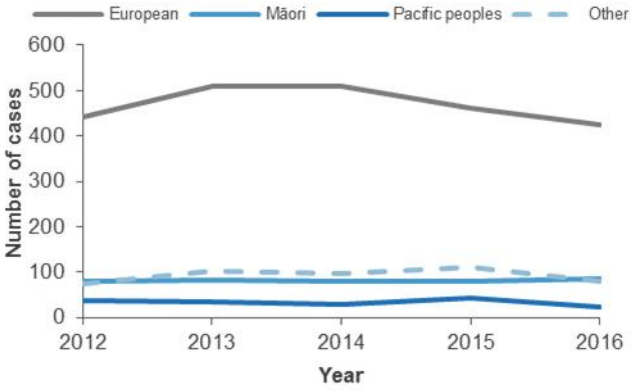
Between 2012 and 2016, case numbers reported by SHCs decreased in all age groups except the 25–29 and 35-39 years age groups. Case numbers were very low in the less than 15 years age group (Figure 66).

Figure 66. Number of NSU cases in SHCs in males by age group, 2012–2016



From 2012 to 2016 case numbers decreased in all ethnic groups apart from the Māori and Other ethnic groups (Figure 67).

Figure 67. Number of NSU cases reported from SHCs, by ethnicity, 2012–2016



CLINIC SURVEILLANCE OF LYMPHOGRANULOMA VENEREUM, CHANCROID AND GRANULOMA INGUINALE

NATIONAL ANALYSIS

2016 analysis

No cases of lymphogranuloma venereum (LGV), chancroid or granuloma inguinale (GI) were reported in 2016.

Trend analysis

Between 2012 and 2016, six cases of LGV and no cases of chancroid or GI were reported by SHCs. In 2013 three cases of LGV were reported from SHCs, all of which were in the Auckland region, in males aged over 40 years, of European (1 case) and Other (2 cases) ethnicity. In 2014 one case of LGV was reported by a SHC in Waikato DHB, in a male 25 years of age and of European ethnicity. In 2015 two cases of LGV were reported by the Auckland and Wellington regions. The cases were both male, aged over 40 years and of European ethnicity.

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APPENDICES

APPENDIX A: CLINIC VISITS

Sexual health clinics

SHCs reported 83,774 clinic visits during 2016, 56.8% (47,557 visits) of which were by females. Between 2015 and 2016, the number of clinic visits increased by 2.1% (from 82,040 to 83,774 visits).

Where information for age and ethnicity was provided, 41.4% (34,689 visits) were by attendees aged less than 25 years, 60.3% (49,666 visits) were European, 23.3% (19,206 visits) were Māori, 12.7% (10,437 visits) were Other and 3.7% (3051 visits) were Pacific peoples ethnicity.

Family planning clinics

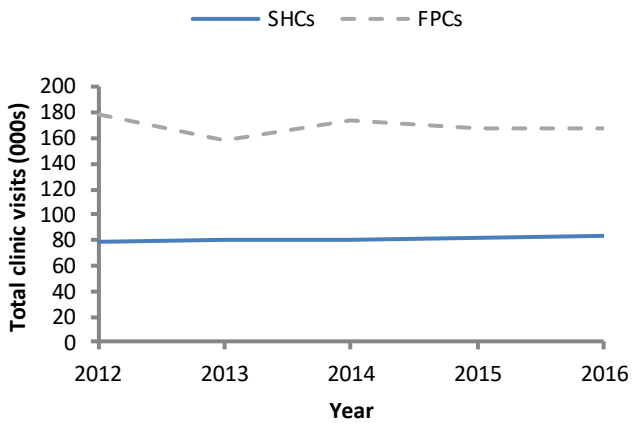
FPCs reported 168,328 clinic visits during 2016, 95.2% (160,171 visits) of which were by females. Between 2015 and 2016, the number of clinic visits increased by 0.4% (from 167,714 visits to 168,328).

Where information for age and ethnicity was provided, 57.1% (96,030 visits) were by attendees aged less than 25 years, 67.5% (110,661 visits) were European, 16.6% (27,128 visits) were Māori, 10.7% (17,460 visits) were Other and 5.2% (8599 visits) were Pacific peoples ethnicity.

Trends in clinic visits

Over the five–year period between 2012 and 2016 the annual numbers of clinic visits in SHCs and FPCs were relatively stable (Figure 68).

Figure 68. Total clinic visits by clinic type, 2012–2016



APPENDIX B: STI SURVEILLANCE CASE DEFINITIONS

Chlamydia	Confirmed	Laboratory isolation or detection of *Chlamydia trachomatis* in a clinical specimen. Cases should be classified as: 1. uncomplicated infection of the lower anogenital tract – this includes urogenital and anorectal infection 2. pelvic inflammatory disease or epididymitis 3. infection of another site (eg, eye or pharynx).
	Probable	Cases must be all of the following: • symptomatic **and** • a contact of a confirmed case **and** • non–laboratory confirmed (test negative or test not done).
Gonorrhoea	Confirmed	Laboratory isolation or detection of *Neisseria gonorrhoeae* from a clinical specimen. Cases should be classified as: 1. uncomplicated infection of one or both of the following: a. urogenital tract b. anorectal area (proctitis) 2. pelvic inflammatory disease or epididymitis 3. extra–genital infection of one or both of the following: a. pharynx b. other site not listed.
	Probable	Cases must be all of the following: • symptomatic **and** • a contact of a confirmed case **and** • non–laboratory confirmed (test negative or test not done).
Anogenital herpes	First diagnosis for the person at your clinic, with either 1. laboratory detection of herpes simplex virus from a clinical specimen **or** 2. a clinically compatible illness in the lower anogenital and buttock area (syphilis should be considered as a cause of genital ulceration).	
Anogenital warts	First diagnosis for the person at your clinic, with visible* typical lesion(s) on internal or external genitalia, perineum, or perianal region. * Do not include persons for whom there is only demonstration of human papillomavirus on cervical cytology or other laboratory method.	
Syphilis	Primary and secondary syphilis cases: case must have presented with compatible clinical symptoms and signs such as genital ulceration or rash confirmed on examination and/or mucocutaneous lesions containing *Treponema pallidum* confirmed by direct fluorescent antibodies (DFA) or polymerase chain reaction (PCR) plus reactive serological tests for syphilis.	
	Early latent syphilis cases: case must have reactive serological tests for syphilis, no clinical symptoms or signs of syphilis plus one of the following: • a clear history of primary or secondary syphilis symptoms within the previous 2 years or • sexual contact with a confirmed case of infectious syphilis within the previous 2 years or • a documented four-fold or greater rise in RPR titre if history of previous treated syphilis or • documented seroconversion to reactive treponemal serology as defined above within the previous 2 years.	
	Unknown duration: case must reactive syphilis serology, no clinical signs or symptoms of syphilis, no previously documented syphilis serology and a rapid plasma reagin (RPR) titre greater than 1:16.	
	Early congenital syphilis as diagnosed or confirmed by a paediatrician or venereologist.	
Non–specific urethritis (males only)	Urethral discharge in a sexually active male with laboratory exclusion of gonorrhoea and chlamydia, who does not meet the definition of a probable case of gonorrhoea or chlamydia.	
Chancroid	Confirmed	Isolation of *Haemophilus ducreyi* from a clinical specimen.
	Probable	Typical 'shoal of fish' pattern on gram stain of a clinical specimen, where syphilis, granuloma inguinale and anogenital herpes have been excluded **or** a clinically compatible illness in a patient who is a contact of a confirmed case.
Granuloma inguinale (GI)	Confirmed	Demonstration of intracytoplasmic Donovan bodies on Wright or Giemsa stained smears or biopsies of clinical specimens.
	Probable	A clinically compatible illness in a patient who is a contact of a confirmed case.
Lymphogranuloma venereum (LGV)	Confirmed	Laboratory detection of *Chlamydia trachomatis* serotype L_1, L_2 or L_3 from a clinical specimen.
	Probable	A clinically compatible illness with complement fixation titre of > 64 and other causes of ulcerations excluded **or** a clinically compatible illness in a person who is a contact of a confirmed case.

APPENDIX C: LIST OF PARTICIPATING LABORATORIES

In 2016 STI surveillance data was received from the following laboratories:

- Northland Pathology Laboratory, Northland
- Kaitaia Hospital Laboratory, Northland
- Bay of Islands Hospital Laboratory, Northland
- Whangarei Hospital Laboratory, Northland
- Dargaville Hospital Laboratory, Northland
- North Shore Hospital Laboratory, Waitemata
- LabPLUS, Auckland
- Labtests, Auckland
- Middlemore Hospital Laboratory, Counties Manukau
- Medlab Hamilton, Waikato
- Pathlab Waikato, Waikato
- Waikato Hospital Laboratory, Waikato
- Thames Hospital, Waikato
- Tokoroa Hospital, Waikato
- Te Kuiti Hospital, Waikato
- Taumarunui Hospital, Waikato
- Laboratory Services Rotorua, Lakes
- Taupo Southern Community Laboratory, Lakes
- Pathlab Bay of Plenty, Bay of Plenty
- Whakatane Hospital Laboratory, Bay of Plenty
- Gisborne Hospital, Tairawhiti
- Taranaki MedLab, Taranaki
- Taranaki Base Hospital, Taranaki
- Hawke's Bay Hospital, Hawke's Bay
- Hawke's Bay Southern Community Laboratory, Hawke's Bay
- Medlab Whanganui, Whanganui
- Medlab Central, MidCentral
- Medlab Wairarapa, Wairarapa
- Hutt Hospital Laboratory, Hutt Valley
- Aotea Pathology, Capital & Coast
- Nelson Southern Community Laboratory, Nelson Marlborough
- Marlborough Southern Community Laboratory, Nelson Marlborough
- Grey Hospital Laboratory, West Coast
- Canterbury Health Laboratories, Canterbury
- Christchurch Southern Community Laboratory, Canterbury
- Timaru Southern Community Laboratory, South Canterbury
- Oamaru Southern Community Laboratory, Southern
- Dunstan Southern Community Laboratory, Southern
- Otago Southern Community Laboratory, Southern
- Balclutha Southern Community Laboratory, Southern
- Queenstown Southern Community Laboratory, Southern
- Invercargill Southern Community Laboratory, Southern

APPENDIX D: MAPS OF STI LABORATORY SURVEILLANCE COVERAGE FOR CHLAMYDIA AND GONORRHOEA, 2012–2016

Figure 69: Laboratory surveillance coverage for chlamydia by DHB, 2012-2016

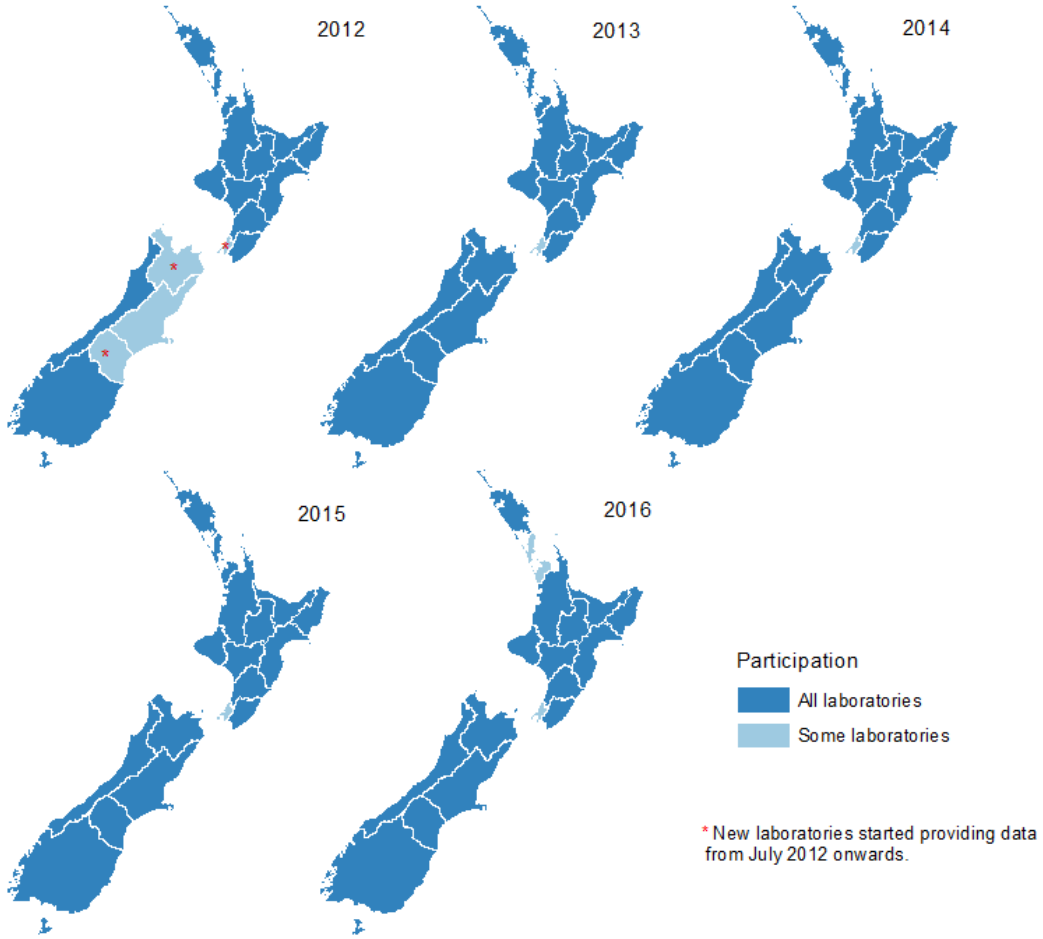
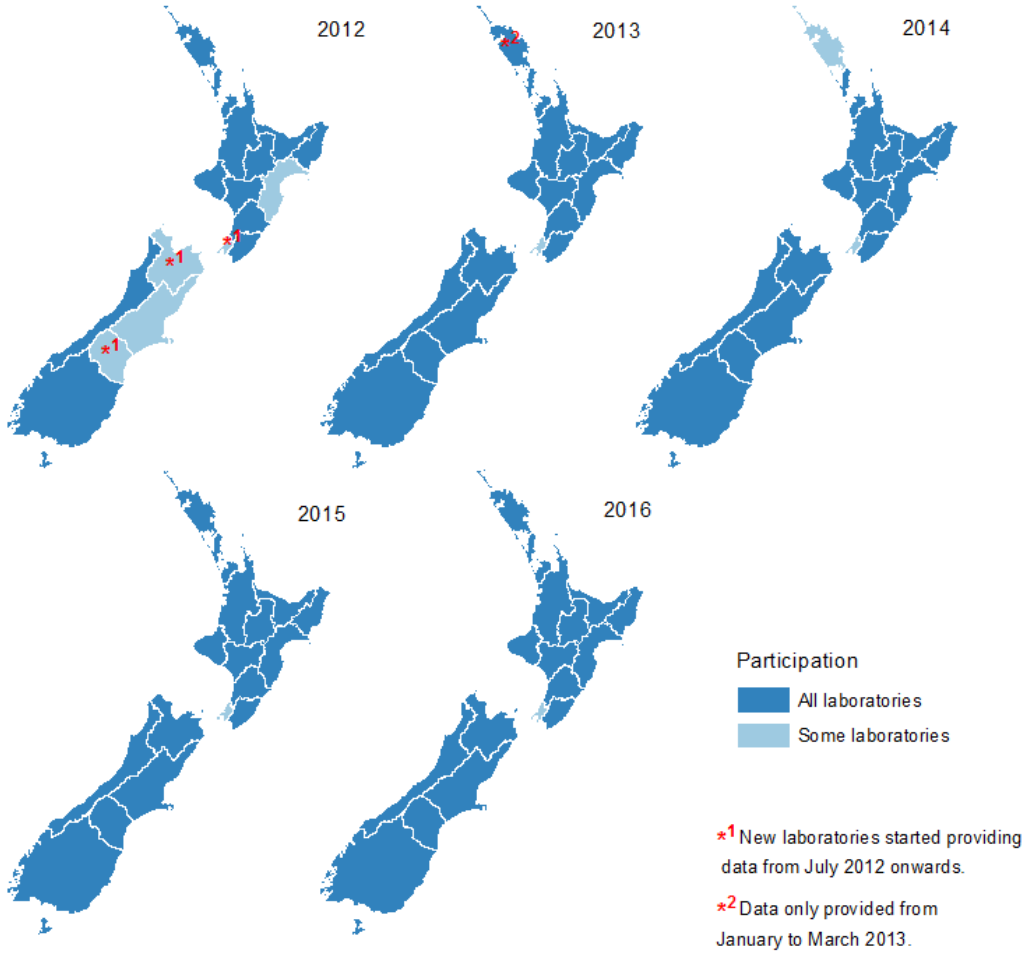


Figure 70. Laboratory surveillance of gonorrhoea by DHB, 2012-2016



APPENDIX E: ENHANCED SYPHILIS SURVEILLANCE QUESTIONNAIRE 2015

E/S/R Enhanced Syphilis Surveillance Form – March 2015

ENHANCED SYPHILIS SURVEILLANCE FORM

NAME OF CLINICIAN: .....

CITY OR TOWN OF CLINIC: .....

CLINIC CASE ID.....

1. SITE OF INITIAL SYPHILIS TESTING

- ☐ Public Sexual Health Clinic
- ☐ General Practice
- ☐ Antenatal Clinic
- ☐ Body Positive Testing Clinic
- ☐ Family Planning Clinic
- ☐ Student Health Clinic
- ☐ NZ AIDS Foundation Testing Clinic
- ☐ Infectious Diseases Clinic
- ☐ Other (please specify.....)

2. PATIENT ID CODE Please complete the box with the first 2 letters of the surname (do not include the letters 'Mac', 'Mc', 'van der' if the surname starts with these), the first initial of given name, sex, and date of birth.

1st letter surname	2nd letter surname	1st letter first name	Sex	Day		Month		Year	

3. GENDER

☐ Male ☐ Female ☐ Transgender

4. ETHNICITY (self-identified - may tick more than one box)

- ☐ NZ European
- ☐ Maori
- ☐ Samoan
- ☐ Tongan
- ☐ Chinese
- ☐ Indian
- ☐ Cook Island Maori
- ☐ Niuean
- ☐ Other (please specify).....

5. COUNTRY OF BIRTH .....

6. CITY OR TOWN OF RESIDENCE .....

7. WHERE WAS THE INFECTION MOST LIKELY ACQUIRED?

- ☐ New Zealand (city/town if known.....)
- ☐ Overseas (country if known.....)
- ☐ Not known

8. DATE PATIENT PRESENTED ..... (Day)/ ..... (Month)/..... (Year)

9. PRIMARY REASON FOR TESTING FOR SYPHILIS

- ☐ Immigration purposes
- ☐ Syphilis Contact
- ☐ Clinical symptoms or suspicion
- ☐ Antenatal Screening
- ☐ Asymptomatic STI screening
- ☐ Other (please specify.....)

1

10. IF SYMPTOMATIC (TICK ALL THAT APPLY)

☐ Genital ulceration ☐ Oral ulceration ☐ Neurological symptoms

☐ Lymphadenopathy ☐ Rash

☐ Other (Please specify……)

11. HIGHEST RPR/VDRL TITRE BEFORE TREATMENT

…… ☐ RPR ☐ VDRL

☐ Not tested ☐ Unknown

12. ON WHAT BASIS DO YOU CONSIDER THIS PERSON TO HAVE INFECTIOUS SYPHILIS? (TICK ALL THAT APPLY)

☐ Clinical grounds ☐ RPR/VDRL titre

Please describe why you think this person has infectious syphilis:

13. HIV SEROSTATUS AT TIME of syphilis diagnosis

☐ Negative ☐ Positive Date of diagnosis (if applicable) **…./ …./…..**

☐ Unknown

14. OTHER CONCURRENT STI DIAGNOSIS(ES) AT TIME of syphilis diagnosis (Tick all that apply)

☐ Chlamydia ☐ Gonorrhoea ☐ Trichomoniasis ☐ Genital Herpes

☐ Genital warts ☐ Other (please identify)……

15. LAST NEGATIVE TEST FOR SYPHILIS

☐ Tested Date …./…./…..
☐ Tested date unknown
☐ Never tested before

16. SEXUAL BEHAVIOUR PREVIOUS 12 MONTHS

☐ Opposite sex partners only ☐ Same sex partners only

☐ Both opposite and same sex partners ☐ Unknown

17. NUMBER OF SEX PARTNERS IN THE PAST 3 MONTHS (Best estimate if unknown)

……. Male ☐ Exact ☐ Approximate

……. Female ☐ Exact ☐ Approximate

18. NUMBER OF SEX PARTNERS IN THE PAST 12 MONTHS (Best estimate if unknown)

……. Male ☐ Exact ☐ Approximate

……. Female ☐ Exact ☐ Approximate

19. PATIENT IS A SEX WORKER

☐ Yes ☐ No ☐ Unknown

20. LIKELY ACQUIRED SYPHILIS THROUGH CONTACT WITH SEX WORKER

☐ Yes ☐ No ☐ Unknown

If "Yes" gender of SW

☐ Female ☐ Male ☐ Transgender

21. ANY SOCIAL/SEXUAL NETWORK IMPLICATED?

☐ "Sex on Site" venue (sauna, club)

☐ Internet-based GPS mobile device App (e.g. Grindr App)

☐ Internet-dating eg NZDating, Find Someone

☐ "Beat" (public toilet, park etc.)

☐ Bar

☐ Other……

Any other relevant comments:

Please return by email, mail or fax to Selina Takanashi:

Selina.Takanashi@esr.cri.nz
Health Intelligence Team - ESR, PO Box 50-348, Porirua 5240
Fax: 04 978 6690

APPENDIX F: ENHANCED SYPHILIS SURVEILLANCE QUESTIONNAIRE 2013

Enhanced Syphilis Surveillance Form - August 2013 Clinic patient ID:.....

ENHANCED SYPHILIS SURVEILLANCE FORM

NAME OF CLINICIAN: .....

CITY OR TOWN OF CLINIC: .....

1. SITE OF INITIAL SYPHILIS TESTING

☐ Public Sexual Health Clinic
☐ General Practice
☐ Antenatal Clinic
☐ Body Positive Testing Clinic
☐ Other (please specify.....)
☐ Family Planning Clinic
☐ Student Health Clinic
☐ NZ AIDS Foundation Testing Clinic
☐ Infectious Diseases Clinic

2. PATIENT ID CODE Please complete the box with the first 2 letters of the surname (do not include the letters 'Mac', 'Mc', 'van der' if the surname starts with these), the first initial of given name, sex, and date of birth.

1st letter surname	2nd letter surname	1st letter first name	Sex	Day		Month		Year	

3. GENDER

☐ Male ☐ Female ☐ Transgender

4. ETHNICITY (self-identified - may tick more than one box)

☐ NZ European
☐ Maori
☐ Niuean
☐ Tongan
☐ Samoan
☐ Cook Island Maori
☐ Chinese
☐ Indian
☐ Other (please specify).....

5. COUNTRY OF BIRTH .....

6. CITY OR TOWN OF RESIDENCE .....

7. WHERE WAS THE INFECTION MOST LIKELY ACQUIRED?

☐ New Zealand (city/town if known.....)
☐ Overseas (country if known.....)
☐ Not known

8. DATE PATIENT PRESENTED ..... (Day)/ ..... (Month)/..... (Year)

9. PRIMARY REASON FOR TESTING FOR SYPHILIS

☐ Immigration purposes
☐ Antenatal Screening
☐ Other (please specify.....)
☐ Syphilis Contact
☐ Asymptomatic STI screening
☐ Clinical symptoms or suspicion

10. IF SYMPTOMATIC (TICK ALL THAT APPLY)

☐ Genital ulceration
☐ Lymphadenopathy
☐ Other (Please specify.....)
☐ Oral ulceration
☐ Rash
☐ Neurological symptoms

11. HIGHEST RPR/VDRL TITRE BEFORE TREATMENT

..... ☐ RPR ☐ VDRL
☐ Not tested ☐ Unknown

12. ON WHAT BASIS DO YOU CONSIDER THIS PERSON TO HAVE INFECTIOUS SYPHILIS? (TICK ALL THAT APPLY)

☐ Clinical grounds ☐ RPR/VDRL titre

1

Please describe why you think this person has infectious syphilis:

13. HIV SEROSTATUS AT TIME of syphilis diagnosis

☐ Negative ☐ Positive Date of diagnosis (if applicable) ..../ ..../.....
☐ Unknown

14. OTHER CONCURRENT STI DIAGNOSIS(ES) AT TIME of syphilis diagnosis (Tick all that apply)

☐ Chlamydia ☐ Gonorrhoea ☐ Trichomoniasis ☐ Genital Herpes
☐ Genital warts ☐ Other (please identify).....

15. LAST NEGATIVE TEST FOR SYPHILIS

☐ Tested Date ..../..../.....
☐ Tested date unknown
☐ Never tested before

16. SEXUAL BEHAVIOUR PREVIOUS 12 MONTHS

☐ Opposite sex partners only ☐ Same sex partners only
☐ Both opposite and same sex partners ☐ Unknown

17. NUMBER OF SEX PARTNERS IN THE PAST 3 MONTHS (Best estimate if unknown)

..... Male ☐ Exact ☐ Approximate
..... Female ☐ Exact ☐ Approximate

18. NUMBER OF SEX PARTNERS IN THE PAST 12 MONTHS (Best estimate if unknown)

..... Male ☐ Exact ☐ Approximate
..... Female ☐ Exact ☐ Approximate

19. PATIENT IS A SEX WORKER

☐ Yes ☐ No ☐ Unknown

20. LIKELY ACQUIRED SYPHILIS THROUGH CONTACT WITH SEX WORKER

☐ Yes ☐ No ☐ Unknown

If "Yes" gender of SW

☐ Female ☐ Male ☐ Transgender

21. ANY SOCIAL/SEXUAL NETWORK IMPLICATED?

☐ "Sex on Site" venue (sauna, club)
☐ Internet-based GPS mobile device App (e.g. Grindr App)
☐ Internet-dating eg NZDating, Find Someone
☐ "Beat" (public toilet, park etc.)
☐ Bar
☐ Other.....

Any other relevant comments:

Please return by email, mail or fax to Ali Borman:
Ali.Borman@esr.cri.nz
Health Intelligence Team, ESR, PO Box 50-348, Porirua 5240.
Fax: 04 978 6690

2

APPENDIX G: ENHANCED SYPHILIS SURVEILLANCE QUESTIONNAIRE 2011

ENHANCED SYPHILIS SURVEILLANCE FORM

NAME OF CLINICIAN: .....

1. SITE OF INITIAL SYPHILIS TESTING

☐ Public Sexual Health Clinic ☐ Family Planning Clinic
☐ General Practice ☐ Student Health Clinic
☐ Antenatal Clinic
☐ Other (please specify.....)

2. PATIENT ID CODE Please complete the box with the first 2 letters of the surname (do not include the letters 'Mac', 'Mc', 'van der' if the surname starts with these), the first initial of given name, sex, and date of birth.

1st letter surname	2nd letter surname	1st letter first name	Sex	Day		Month		Year	

3. GENDER

☐ Male ☐ Female ☐ Transgender

4. ETHNICITY (self-identified - may tick more than one box)

☐ NZ European ☐ Chinese
☐ Maori ☐ Indian
☐ Samoan ☐ Cook Island Maori
☐ Tongan ☐ Niuean
☐ Other (please specify).....

5. COUNTRY OF BIRTH .....

6. CITY OR TOWN OF RESIDENCE .....

7. WHERE WAS THE INFECTION MOST LIKELY ACQUIRED?

☐ New Zealand (city/town if known.....)
☐ Overseas (country if known.....)
☐ Not known

8. DATE PATIENT PRESENTED ..... (Day)/ ..... (Month)/..... (Year)

9. REASON FOR TESTING FOR SYPHILIS

☐ Asymptomatic STI screening ☐ Immigration purposes ☐ Syphilis Contact
☐ Clinical symptoms or suspicion ☐ Antenatal Screening
☐ Other (please specify.....)

10. DID THE PATIENT HAVE ANY SYMPTOMS?

☐ Yes ☐ No

11. IF SYMPTOMS...

☐ Genital ulceration ☐ Rash ☐ Oral ulceration ☐ Neurological symptoms
☐ Lymphadenopathy ☐ Other (Please specify.....)

12. HIGHEST RPR/VDRL TITRE BEFORE TREATMENT

…… ☐ Unknown (not tested)

13. HIV SEROSTATUS

☐ Negative ☐ Positive ☐ Unknown

14. OTHER CONCURRENT STI DIAGNOSIS(ES) (Tick all that apply)

☐ Chlamydia ☐ Gonorrhoea ☐ Trichomoniasis ☐ Genital Herpes

☐ Genital warts ☐ Other (please identify)……

15. DATE OF LAST NEGATIVE TEST FOR SYPHILIS ..../ .../.....

☐ Never tested before ☐ Tested but date unknown

16. SEXUAL BEHAVIOUR PREVIOUS 12 MONTHS

☐ Opposite sex partners only ☐ Same sex partners only

☐ Both opposite and same sex partners ☐ Unknown

17. NUMBER OF SEX PARTNERS IN THE PAST 3 MONTHS

☐☐ Male ☐☐ Female ☐ Unknown

18. NUMBER OF SEX PARTNERS IN THE PAST 12 MONTHS

☐☐ Male ☐☐ Female ☐ Unknown

19. DO YOU THINK ORAL SEX WAS RESPONSIBLE?

☐ Yes ☐ No ☐ Unknown

20. PATIENT IS A SEX WORKER

☐ Yes ☐ No ☐ Unknown

21. LIKELY ACQUIRED SYPHILIS THROUGH CONTACT WITH SEX WORKER

☐ Yes ☐ No ☐ Unknown

If "Yes" gender of SW ☐ Female ☐ Male ☐ Transgender

22. ANY SOCIAL/SEXUAL NETWORK IMPLICATED?

☐ "Sex on Site" venue (sauna, club) ☐ Internet ☐ "Beat" (public toilet, park etc.)
☐ Bar
☐ Other……

Any other relevant comments:

Please return by mail or fax to:

Rebecca Psutka
Department of Preventive and Social Medicine, University of Otago
P.O. Box 913, Dunedin 9054. fax: 03 479 7298

INSTITUTE OF ENVIRONMENTAL SCIENCE AND RESEARCH LIMITED

Kenepuru Science Centre
34 Kenepuru Drive, Kenepuru, Porirua 5022
PO Box 50348, Porirua 5240
New Zealand
T: +64 4 914 0700 **F:** +64 4 914 0770

Mt Albert Science Centre
120 Mt Albert Road, Sandringham, Auckland 1025
Private Bag 92021, Auckland 1142
New Zealand
T: +64 9 815 3670 **F:** +64 9 849 6046

NCBID – Wallaceville
66 Ward Street, Wallaceville, Upper Hutt 5018
PO Box 40158, Upper Hutt 5140
New Zealand
T: +64 4 529 0600 **F:** +64 4 529 0601

Christchurch Science Centre
27 Creyke Road, Ilam, Christchurch 8041
PO Box 29181, Christchurch 8540
New Zealand
T: +64 3 351 6019 **F:** +64 3 351 0010

www.esr.cri.nz