SURVEILLANCE REPORT

SEXUALLY TRANSMITTED INFECTIONS IN NEW ZEALAND 2014

E/S/R

THE SCIENCE BEHIND THE TRUTH

Prepared as part of a Ministry of Health contract for scientific services by the Health Intelligence Team, Institute of Environmental Science and Research Limited

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SUMMARY

SUMMARY

In New Zealand, sexually transmitted infections (STIs) with the exception of AIDS are not notifiable. Surveillance efforts are 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 2014 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).

With the increasing participation of diagnostic laboratories around New Zealand, laboratory information has become the best indicator of disease incidence for chlamydia and gonorrhoea in most district health boards (DHBs). Laboratories receive specimens from all health providers. In 2014, it was estimated that laboratory surveillance reported approximately two and a half times the number of chlamydia cases and about three times the number of gonorrhoea cases reported by clinic surveillance.

SHCs also provide important information about the epidemiology of STIs. This is because many STIs are diagnosed clinically rather than via laboratory testing (either because laboratory testing is not routinely undertaken for that STI or is insufficient by itself to make the diagnosis). However, the number of cases reported through the clinic-based surveillance system underestimates the true burden of STI disease because a substantial percentage of STIs are diagnosed by other health care providers, particularly primary health care practitioners.

Since 2009, individual DHB and estimated national rates of chlamydia and gonorrhoea have been calculated from laboratory surveillance data. In 2013 and 2014, DHB rates were calculated for all DHBs (except Northland for gonorrhoea) from laboratory surveillance data.

Chlamydia

Chlamydia was the most commonly reported STI in 2014, in both laboratory and clinic settings. A national chlamydia rate (based on all DHBs) of 629 per 100,000 population was calculated from laboratory surveillance data. Eighty-three percent of cases reported through laboratory surveillance data in 2014 were aged between 15 and 29 years. There were 83 cases of chlamydia in infants aged less than one year.

Laboratory surveillance data showed the estimated national rate of chlamydia (based on all DHBs where data was available) was stable between 2009 and 2011 but has decreased since 2012. In those aged between 15 and 29 years, the highest estimated chlamydia rates in 2014 were reported in the Māori and Pacific peoples ethnic groups. Māori females aged 15–19 years reported the highest estimated rate by age group and sex, more than twice the national estimate.

In data derived from SHCs, over 50% of cases were from non-European ethnic groups (Māori, Pacific peoples and Other). In data from laboratories, Tairawhiti, Lakes and Hawke's Bay DHBs reported the highest chlamydia rates.

Gonorrhoea

In 2014, a national gonorrhoea rate (based on 19 DHBs) of 70 per 100,000 population was estimated from laboratory surveillance data. Seventy-three percent of cases reported by laboratories were aged between 15 and 29 years and one case of gonorrhoea in an infant was reported. Of the 19 DHBs meeting the laboratory selection criteria for analysis in 2014, Tairawhiti reported the highest gonorrhoea rate, over four and a half times the estimated national rate.

In those aged between 15 and 29 years, the highest estimated gonorrhoea rates were reported in the Māori and Pacific peoples ethnic groups. Māori females aged 15–19 years reported the highest estimated rate by age group and sex, more than three times the national estimate.

In SHCs, 58% of cases were from non-European ethnic groups (Māori, Pacific peoples and Other).

The introduction of testing via nucleic acid amplification tests (NAAT) for gonorrhoea since 2011 may have impacted on gonorrhoea case numbers.

Infectious syphilis

The number of cases of syphilis reported by SHCs and FPCs increased notably between 2013 and 2014 (from 85 to 141 cases). The cases were predominantly male (95.7%), MSM, and occurred most commonly in the 20–24 years and 30–34 years age groups. The majority of MSM cases occurred in the NZ European ethnic group (57.0%). Syphilis cases were predominantly reported from clinics in the Auckland region and Canterbury DHB.

Other STIs

From 2013 to 2014, SHCs reported a decrease in case counts of genital warts, genital herpes and NSU (by 4.2%, 2.5% and 2.1%, respectively). The five-year trend from 2010 to 2014 showed a decrease in case counts of genital warts, genital herpes and NSU (by 36.8%, 3.2% and 1.3%, respectively).

One case of lymphogranuloma venereum and no cases of chancroid or granuloma inguinale were reported in 2014.

INTRODUCTION

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INTRODUCTION

About this report

The *Sexually transmitted infections in New Zealand: Annual Surveillance Report* summarises the epidemiology of STIs in 2014, 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 chlamydia and 19 DHBs for 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. In addition to the inclusion of test positivity and population testing rates for chlamydia and gonorrhoea by age and sex in 2013, this year's report provides analysis by ethnicity.

The clinic surveillance data reported this year, as for 2012–2013, 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 for which ESR took over reporting in 2013. Enhanced syphilis surveillance draws on data 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.

In New Zealand STIs are not 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.

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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.

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), SHCs diagnose a substantial proportion of the total number of STIs and their data can provide an alert for changes occurring in the wider population.

Comparison with previous years

From 2010 to 2014, 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 month inclusion criteria. In 2010, 1 SHC and 2 FPCs did not meet this criteria, however their data is included in the trend analyses. 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 2010 to 2014 were calculated using a set of DHBs who had complete data for 2010 to 2012 and all DHBs (except Northland for gonorrhoea) in 2013 and 2014. 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.

Table 1. NAAT testing for gonorrhoea in laboratories

Laboratory[a]	DHB	NAAT testing	Year introduced
Northland Pathology	Northland	Yes	2012
Whangarei Hospital	Northland	No	-
Northshore 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.

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 [1]. Surveillance is an important part of the strategy to reduce the short and long term burden of sexually transmitted infections [2]. New Zealand's STI surveillance system has five identified purposes [3]:

- 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 useful, complementary source of STI data.

Laboratory-based surveillance of gonorrhoea and chlamydia began in the Waikato and Bay of Plenty regions in 1998. The Auckland region also began surveillance of gonorrhoea in 1998, with the addition of chlamydia in 2001.

Since June 2004, efforts have been made to extend STI surveillance to additional diagnostic laboratories across New Zealand.

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. Laboratory participation in 2014 (see Appendix D: 2014 participation map) was the same as it was in 2013.

In 2013 and 2014, ESR 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. This information is particularly important to document and monitor the higher burden of STIs previously indicated in Māori and Pacific populations.

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), trichomonas, 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) to allow a clinic-based incidence rate to be calculated. Demographic information for cases (age, sex and ethnicity) has been reported since 1996.

Clinic-based surveillance progressed markedly in 1998. The Ministry of Health (MoH) contracted ESR to implement the expansion of the STI surveillance system, which focussed first on data collection from family planning clinics (FPCs) and student and youth health clinics (SYHCs), to provide a more comprehensive picture of the STI disease burden in New Zealand. FPCs provide sexual and reproductive health services. SYHCs often operate as drop-in centres and provide general and/or specialist health services for students and staff. FPCs and SYHCs charge a variable fee for their services.

In 1998 ESR convened an expert committee 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 MoH, 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. However, FPCs provided additional data in 2013 and 2014. The additional data includes reasons for why tests are undertaken and will allow estimates of STI prevalence in certain population groups to be calculated. A means of obtaining routine surveillance information on STIs in men who have sex with men (MSM), a group with a higher burden of STIs, is under discussion with some SHCs.

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 [4]. 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 [5-8]. Subsequently the AIDS Epidemiology Group (AEG) in Dunedin offered to undertake this project and published a report in 2011 [5]. 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 [9].

In 2013 the MoH 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 as well as the 2013 and 2014 data collected by ESR.

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.

New data provided includes National Health Index (NHI) numbers, which are stored on the Sharepoint portal website. NHI numbers are used to retrieve prioritised ethnicity information from the Ministry of Health and to update date of birth and sex where data is missing.

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. Improvements to STI data collection and analysis methods since January 2013 have 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 did not provide data in the new format for 2013 and 2014.

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.

The list of STIs under clinic-based surveillance and the case definitions for these infections has varied over time. They were most recently revised in 1998, when STI surveillance was expanded to include data from clinics other than SHCs. 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 (Appendices E and F for questionnaires for 2013 and 2011). 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 29 April 2015 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 and Excel, and R [10].

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 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.

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 2014 mid-year population estimates published by Statistics New Zealand. Population estimates for previous years were updated due to the 2013 census, hence rates may differ to those published in earlier reports.

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 2014 mid-year population estimates from Statistics New Zealand. Ethnicity is prioritised in the following order: Māori, Pacific peoples, Asian, MELAA, European or Other (including New Zealander) ethnic groups.

Statistical tests

The method used to calculate the confidence intervals for the estimated national rate for gonorrhoea in 2014 and the five-year estimated national rates trend analyses for chlamydia and gonorrhoea adjusts for the fact that we have data from most, but not all DHBs [11]. 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 (2010–2014) has been reported for laboratory surveillance trends and clinic trends, except for the long term trend

analyses where a 17-year period (1998–2014) has been reported (limited to three regions).

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).

In addition, the following participation criteria had to be met for each analysis type.

1. 2014 analysis: each laboratory in the DHB must have provided data for all 12 months of 2014. 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.
2. Trend analyses (national, age and sex, and test positivity): previously for a DHB to be included in trend analyses data would need to have been provided for all years that the trend covers. From 2013 all DHBs provided data (except for Northland for gonorrhoea) and were included in this analysis. 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.
3. 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.
4. Specimen site analysis (in addition to the above criteria): laboratories with a large percentage of specimen sites recorded as unknown were excluded from the specimen site analysis. Fewer laboratories met this criterion than for the trend analyses.

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.

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.

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

District Health Board	Annual analysis 2014		Trend analyses		Individual DHB trend analysis	
	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea
Northland	✓	×	✓	✓[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 for 2013 and 2014.
[d] Full year of data provided in 2013 and 2014 only. ✓ = Selected × = Excluded

Enhanced syphilis surveillance analytical methods

All analyses are based on data submitted prior to 26 June 2015. 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 [12] 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 2014, and all syphilis cases from 2013–2014 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 2011–2012 were not reconciled and accordingly the data in the enhanced syphilis surveillance vary from the clinic surveillance for these years.

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 (MSM and heterosexual).

Quality of surveillance data

Laboratory participation

In 2014, 42 laboratories across all DHBs in New Zealand voluntarily participated in the STI surveillance programme. Of these, 41 laboratories provided chlamydia data and 38 laboratories provided gonorrhoea data. 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 6 respectively. Interpretation of the ethnicity analyses should consider the varying levels of data completeness.

Clinic participation

In 2014, 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. 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 clinics participated in the enhanced surveillance of infectious syphilis.

Table 5. Chlamydia laboratory ethnicity data completeness by DHB, 2014

DHB	Tests with no NHI (%)	Positive tests with no NHI (%)
Northland	10.8	17.3
Auckland region[a]	2.3	3.6
Waikato	5.8	10.0
Lakes	12.2	17.8
Bay of Plenty	29.9	43.2
Tairawhiti	24.6	32.5
Taranaki	-	-
Hawke's Bay	0.6	0.7
Whanganui	8.5	9.1
MidCentral	12.5	16.5
Wellington region[b]	12.3	14.3
Wairarapa	2.3	6.6
Nelson Marlborough	3.8	6.1
West Coast	18.5	23.9
Canterbury	7.8	10.1
South Canterbury	9.0	14.8
Southern	3.0	5.8
Total[c]	**6.8**	**10.4**

[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, 2014

DHB	Tests with no NHI (%)	Positive tests with no NHI (%)
Northland	-	-
Auckland region[a]	2.3	9.9
Waikato	6.7	20.3
Lakes	12.3	28.6
Bay of Plenty	30.0	53.1
Tairawhiti	31.2	40.9
Taranaki	-	-
Hawke's Bay	0.6	1.1
Whanganui	15.8	30.8
MidCentral	19.3	35.1
Wellington region[b]	12.1	32.5
Wairarapa	9.4	18.2
Nelson Marlborough	3.6	18.5
West Coast	18.5	66.7
Canterbury	6.9	23.5
South Canterbury	8.9	45.5
Southern	3.1	20.5
Total[c]	**6.8**	**18.7**

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

CHLAMYDIA

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CHLAMYDIA

Key findings

- In 2014, genital chlamydia infection was the most commonly reported STI in New Zealand.
- The 2014 national chlamydia rate was 629 cases per 100,000 population, a non-significant decrease from 637 cases per 100,000 population in 2013.
- There was more than twice the number of laboratory-diagnosed cases of chlamydia in females than in males in 2014.
- Chlamydia is most commonly diagnosed in females in the 15–19 years age group and in males in the 20–24 years age group in both the laboratory and clinic settings.
- There has been a steady decline in the chlamydia rate for females in the 15–19 years age group since 2010.
- Since 2010, Lakes and Tairawhiti DHBs have consistently had the highest chlamydia rates.
- Chlamydia is predominantly diagnosed from cervical samples in women and urine samples in men.
- 83 laboratory-diagnosed cases of chlamydia were reported in the less than one year age group.
- In those aged 15–29 years the highest estimated chlamydia rates were reported in the Māori and Pacific peoples ethnic groups.
- Māori females aged 15–19 years reported the highest estimated rate, more than twice the national estimate.
- Annual population testing rates were highest for both males and females in the 20–24 years age group.
- Māori females in the 20–24 years age group had the highest testing rate across the ethnic groups.
- Annual testing coverage rates in the at risk age groups suggest that <10% of males and 23–38% of females had at least one annual test.

Chlamydia infection is asymptomatic in approximately 25% of male cases and 70% of female cases [13]. 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 [14].

Laboratory surveillance of chlamydia

National and DHB analysis

Annual 2014 analysis

In 2014, 41 laboratories provided chlamydia data. All DHBs met the selection criteria for chlamydia reporting (see Analytical methods). Laboratories in these DHBs reported positive tests from 28,331 cases. The national chlamydia rate was 629 per 100,000 population, a non-significant decrease from the 2013 national rate of 637 per 100,000 population (see Data collection regarding new data processing methods introduced in 2013 that allow for exclusion of repeat tests).

The highest number of laboratory-confirmed chlamydia cases was seen in the Auckland region (9457 cases) and in Canterbury DHB (2770 cases) (Table 7). The highest rate of chlamydia was reported in Lakes DHB (1144 per 100,000, 1182 cases), followed by Tairawhiti (1143 per 100,000, 538 cases) and Hawke's Bay (889 per 100,000, 1416 cases) DHBs. Although most DHBs reported a decrease or a small, non-signifcant increase in rates from 2013 to 2014, Northland and MidCentral DHBs both showed significant increases in rates (Table 7).

Table 7. Number of laboratory-confirmed chlamydia cases and population rates by DHB, 2013–2014

DHB	Number of laboratory-confirmed cases		Rate per 100,000 population		Rate change[c,d]
	2014	2013	2014	2013	
Northland	1000	774	602	470	↑
Auckland region[a]	9457	9793	613	649	↓
Waikato	2535	2633	661	697	↓
Lakes	1182	1253	1144	1214	↓
Bay of Plenty	1497	1480	689	689	NC
Tairawhiti	538	684	1143	1455	↓
Taranaki	519	563	451	495	↓
Hawke's Bay	1416	1321	889	834	↑
Whanganui	437	404	702	649	↑
MidCentral	1184	1044	695	618	↑
Wellington region[b]	2615	2613	595	599	↓
Wairarapa	207	224	484	529	↓
Nelson Marlborough	707	647	494	455	↑
West Coast	108	150	331	455	↓
Canterbury	2770	2601	539	516	↑
South Canterbury	266	272	458	473	↓
Southern	1893	1860	611	607	↑
Total	**28,331**	**28,316**	**629**	**637**	↓

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHB.

[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.

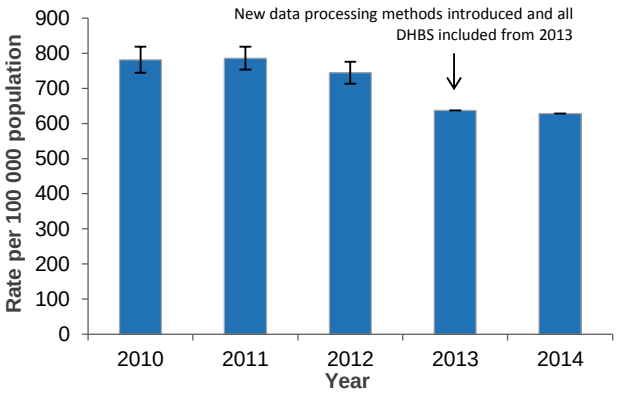
Trends in laboratory diagnoses

1. National rate trend analysis

All DHBs where data was available were included in the national rate trend analysis for chlamydia (see Analytical methods). From 2013 to 2014, the national rate for chlamydia decreased (from 637 to 629 per 100,000 population). There was also a decrease from the 2010 estimated rate to the 2014 national rate (from 782 to 629 per 100,000). The estimated national rates from 2010 to 2012 (with a 95% confidence interval indicated) and the 2013 and 2014 national rates are shown in Figure 1.

The comparison of the 2013–2014 national and DHB rates with the 2010–2012 estimated rates should be interpreted with caution due to the introduction of a process to exclude repeat tests within a defined period for an individual and the addition of DHBs that were not previously reporting. Overall, 5.9% (1788) of positive specimens were excluded as they were considered to be repeat tests. To directly compare 2013–2014 data with previous years, annual rates were estimated for 2013–2014 using only the 15 DHBs that contributed data from 2010–2012 and including repeat tests. The estimated rate for 2014 (699 per 100,000) was significantly lower than the estimated rate for 2013 (712 per 100,000) and the estimates for 2010–2012 (745–786 per 100,000).

Figure 1. National chlamydia rate, 2010–2014



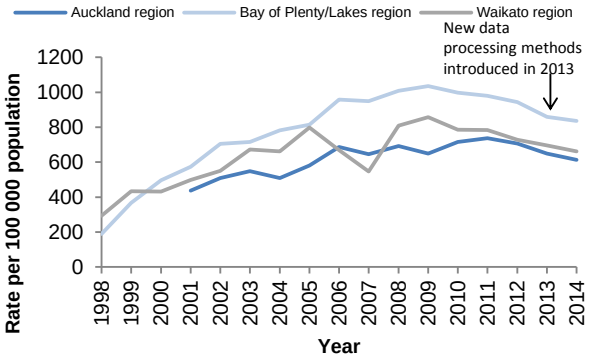
Note: Estimated rates were calculated for 2010–2012 with 95% CIs based on data from 15 DHBs.

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).

2. Long term trend analysis

Laboratory data relating to chlamydia has been collected from laboratories in Waikato, Lakes and Bay of Plenty DHBs since 1998 and in the Auckland region since 2001 (Figure 2). Chlamydia rates generally increased in these regions until 2005. The rate plateaued from 2005 and has decreased in all regions since 2011.

Figure 2. Chlamydia rates in selected regions, 1998–2014

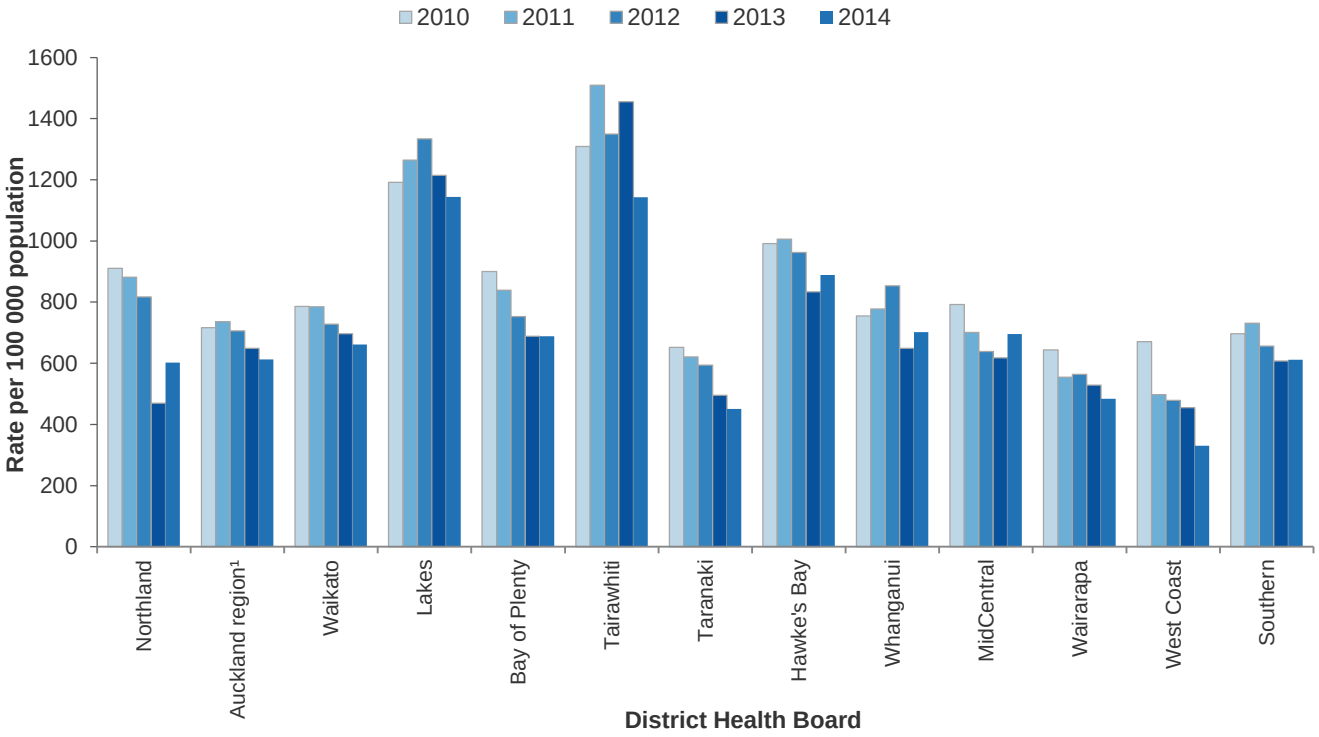


Note: Auckland region is comprised of Waitemata, Auckland and Counties Manukau DHBs.

3. Individual DHB trend analysis

Fifteen DHBs met the selection criteria for the individual DHB trend analysis. From 2010 to 2014, the chlamydia rate varied among DHBs and across years (Figure 3). Over this period Lakes and Tairawhiti DHBs experienced high and generally increasing rates up until 2013, followed by a decrease in 2014. Other DHBs generally had decreasing rates across the time period, although several DHBs showed an increase from 2013 to 2014 (Northland, Hawke's Bay, Whanganui, MidCentral and Southern) despite the same analysis method being used in both of these years.

Figure 3. Chlamydia rates by DHB, 2010–2014



[1] Waitemata, Auckland and Counties Manukau DHBs.
Note: New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Data collection).

Age and sex distribution of laboratory-confirmed cases

2014 analysis

Age was recorded for 99.4% (28,165/28,331) and sex for 99.8% (28,261/28,331) of laboratory-confirmed chlamydia cases. The national rate for females (869 per 100,000 population, 19,986 cases) was more than twice the national rate for males (375 per 100,000 population, 8275 cases) (Table 8).

The highest rate of chlamydia in males was reported for Lakes DHB (570 per 100,000, 288 cases), followed by Hawke's Bay (502 per 100,000, 386 cases) and Tairawhiti (492 per 100,000, 113 cases) DHBs. The highest rate of chlamydia cases in females was reported for Tairawhiti DHB (1761 per 100,000, 425 cases), followed by Lakes (1688 per 100,000, 892 cases) and Hawke's Bay (1250 per 100,000, 1030 cases) DHBs.

The mean age of laboratory-confirmed chlamydia cases was 23.3 years (median age 21 years, range 0–94 years). Eighty-three percent (23,442) of positive cases were aged between 15 and 29 years. The highest national age-specific rate of laboratory-confirmed chlamydia for males occurred in the 20–24 years age group (1833 per 100,000, 3052 cases), whereas for females, the highest national age-specific rate of laboratory-confirmed chlamydia occurred in the 15–19 years age group (4774 per 100,000, 7262 cases). This is illustrated in Figure 4.

The highest DHB age-specific rates were reported in the 15–19 years age group from Lakes (7644 per 100,000, 545 cases) and Tairawhiti (7379 per 100,000, 252 cases) DHBs. Table 9 presents the number of laboratory-confirmed chlamydia cases, and chlamydia population rates by DHB and age group for 2014.

Of the 87 laboratory-confirmed chlamydia cases reported in the 0–4 years age group, 83 were aged less than one year (Table 9). Estimated population data was not available to calculate age-specific rates by DHB for this age group.

Table 8. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB and sex, 2014

DHB	Number of laboratory-confirmed cases				Rate per 100,000 population		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	234	766	0	1000	289	901	602
Auckland region[a]	2789	6647	21	9457	369	844	613
Waikato	747	1786	2	2535	398	913	661
Lakes	288	892	2	1182	570	1688	1144
Bay of Plenty	393	1091	13	1497	374	972	689
Tairawhiti	113	425	0	538	492	1761	1143
Taranaki	135	384	0	519	239	657	451
Hawke's Bay	386	1030	0	1416	502	1250	889
Whanganui	112	324	1	437	369	1016	702
MidCentral	394	783	7	1184	476	894	695
Wellington region[b]	827	1780	8	2615	387	787	595
Wairarapa	43	164	0	207	207	748	484
Nelson Marlborough	199	506	2	707	284	694	494
West Coast	29	79	0	108	177	486	331
Canterbury	941	1822	7	2770	367	708	539
South Canterbury	77	188	1	266	269	638	458
Southern	568	1319	6	1893	373	839	611
Total	**8275**	**19,986**	**70**	**28,331**	**375**	**869**	**629**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

Table 9. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB and age group, 2014

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	4	-	0	-	29	241	441	3980	303	3521	132	1719	45	612	19	233	27	31	0	-	1000	602
Auckland region[a]	30	27	1	-	100	99	2404	2186	3390	2722	1708	1464	807	734	431	428	571	86	16	-	9458	613
Waikato	11	39	0	-	36	137	902	3232	856	3116	364	1532	163	740	79	358	124	70	0	-	2535	661
Lakes	1	-	0	-	36	470	545	7644	339	5334	126	2134	58	1045	39	649	38	77	0	-	1182	1144
Bay of Plenty	7	47	0	-	58	378	541	3806	472	4062	217	2027	83	771	58	488	49	43	11	-	1496	688
Tairawhiti	1	-	0	-	17	440	252	7379	149	5147	75	2901	24	980	4	-	16	75	0	-	538	1143
Taranaki	3	-	2	-	8	104	168	2276	140	2113	51	793	25	383	12	178	14	24	98	-	521	453
Hawke's Bay	7	61	0	-	56	484	585	5318	465	5314	173	2207	52	669	39	450	39	48	0	-	1416	889
Whanganui	3	-	0	-	12	281	171	4156	139	3971	51	1591	16	530	14	444	6	19	25	-	437	702
MidCentral	3	-	0	-	11	98	428	3335	460	3595	155	1538	58	631	28	306	32	39	9	-	1184	695
Wellington region[b]	7	24	0	-	31	113	730	2471	1026	2818	388	1254	189	628	102	344	141	71	1	-	2615	595
Wairarapa	1	-	0	-	4	-	96	3459	60	2771	25	1389	11	554	6	276	4	-	0	-	207	484
Nelson Marlborough	0	-	0	-	5	54	258	3007	243	3716	99	1494	44	624	19	241	37	47	0	-	705	493
West Coast	0	-	0	-	2	-	37	2005	36	2034	21	1186	6	363	3	-	3	-	0	-	108	331
Canterbury	3	-	0	-	42	134	866	2454	1023	2699	434	1286	161	509	90	287	148	60	3	-	2770	539
South Canterbury	1	-	0	-	6	-	108	2888	100	3478	28	1026	10	365	6	197	7	22	0	-	266	458
Southern	5	27	0	-	12	64	566	2487	819	3277	277	1493	114	639	36	199	61	40	3	-	1893	611
Total	**87[d]**	**28**	**3**	**-**	**465**	**157**	**9098**	**2902**	**10,020**	**3076**	**4324**	**1486**	**1866**	**672**	**985**	**361**	**1317**	**62**	**166**	**-**	**28,331**	**629**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

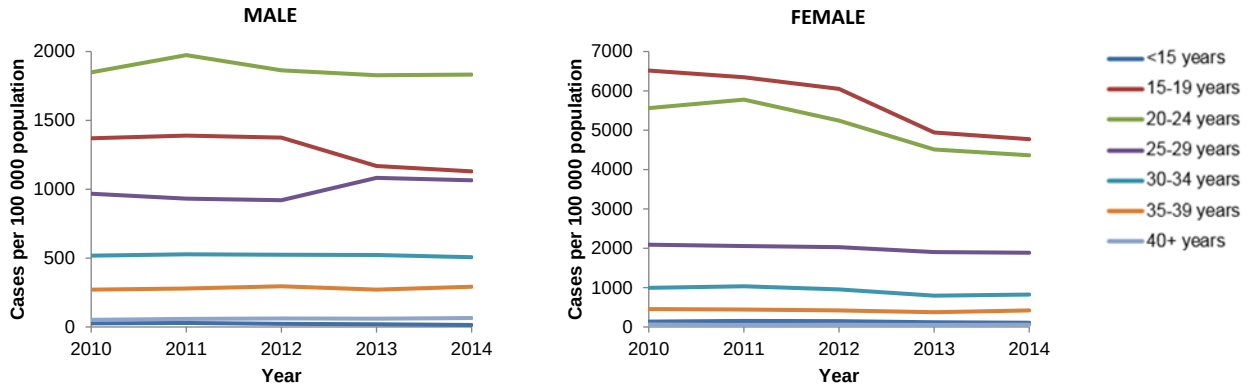
[c] Rates have not been calculated where there were fewer than five cases in any category.

[d] Includes 83 cases under one year of age.

Trends in age and sex distribution of chlamydia

Between 2010 and 2014, the overall distribution of laboratory-confirmed chlamydia cases by age and sex remained relatively stable. Chlamydia rates for males were generally stable, except for a 24.9% increase in the 40 years and over age group, a 10.0% increase in the 25–29 years age group, and a 17.5% decrease in the 15–19 years age group. Chlamydia rates decreased in all age groups for females, with rate changes ranging from a 6.0% decrease in the 40 years and over age group to a 26.7% decrease in the 15–19 years age group. Chlamydia rates by age group and sex from 2010 to 2014 are presented in Figure 4.

Figure 4. Chlamydia rates per 100,000 population by age group and sex, 2010–2014



Note: Estimated rates were calculated for 2010–2012 based on data from 15 DHBs. All DHBs were included in 2013 and 2014. 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

2014 analysis

Ethnicity information was able to be retrieved using the NHI from all DHBs except Taranaki. For these DHBs ethnicity was recorded for 87.1% (24,215/27,812) of laboratory-confirmed chlamydia cases. The ethnicity analyses should be interpreted with caution due to the varying levels of data completeness by DHB (see Quality of surveillance data).

The highest estimated national rate of chlamydia in males was seen in the Māori ethnic group (735 per 100,000, 1933 cases), followed by Pacific peoples (695 per 100,000, 955 cases) and MELAA (501 per 100,000, 115 cases) ethnic groups. The highest rate of chlamydia in females was also reported in the Māori ethnic group (2468 per 100,000, 6870 cases) followed by Pacific peoples (1953 per 100,000, 2738 cases) and European or Other (486 per 100,000, 7089 cases) ethnic groups.

Thirty-seven percent (10,317 cases) of positive cases were from the European or Other ethnic group, and 31.7% (8811 cases) were from the Māori ethnic group. Table 10 presents the number of laboratory-confirmed chlamydia cases and chlamydia population rates by ethnic group for 2014.

Eighty laboratory-confirmed chlamydia cases were aged less than one year. These cases were from the Māori (42 cases), European or Other (18 cases), Pacific peoples (13 cases), Unknown (5 cases) and Asian (2 cases) ethnic groups. Specimen sites reported for these cases were: Eye (65 cases), Other (4 cases) and Unknown (11 cases) (Table 11).

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 2014 (15–19 years, 20–24 years and 25–29 years age groups). Across these age groups the highest rates occurred in the Māori and Pacific peoples ethnic groups for both males and females, and these rates were notably higher than the respective estimated national rates for each ethnic group. The highest age and sex-specific rate occurred in the 15–19 years age group in females in the Māori ethnic group (11,246 per 100,000, 2839 cases). Rates amongst females were consistently higher than those of their male counterparts. The female Māori rates were two to three times greater than the estimated national rate in all three age groups.

Table 10. Number of laboratory-confirmed chlamydia cases and chlamydia rates by ethnicity and sex, 2014

Ethnicity	Number of laboratory-confirmed cases[a]				Rate per 100,000 population[a]		
	Male	Female	Unknown	Total	Male	Female	Total
Māori	1933	6870	8	8811	735	2468	1627
Pacific peoples	955	2738	3	3696	695	1953	1332
Asian	345	825	2	1172	156	353	258
MELAA	115	103	1	219	501	477	491
European or Other	3223	7089	5	10,317	231	486	361
Unknown	1569	1977	51	3597	-	-	-
Total	**8140**	**19,602**	**70**	**27,812**	**378**	**875**	**633**

[a] Excludes Taranaki DHB.

Table 11. Specimen site of laboratory-confirmed chlamydia cases in the less than one year age group by ethnicity, 2014

Ethnicity	Specimen site of laboratory-confirmed cases[a]			
	Eye	Other	Unknown	Total
Māori	36	0	6	42
Pacific peoples	10	2	1	13
Asian	1	0	1	2
MELAA	0	0	0	0
European or Other	16	2	0	18
Unknown	2	0	3	5
Total	**65**	**4**	**11**	**80**

[a] Excludes Taranaki DHB.

Table 12. Number of laboratory-confirmed chlamydia cases and chlamydia rates by ethnicity, age group and sex, 2014

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	685	2839	3526	2571	11,246	6796	653	2168	2825	2898	9230	6139	290	883	1173	1745	4583	3269
Pacific peoples	230	753	984	1622	5457	3517	374	1034	1409	2938	7956	5477	173	495	668	1737	4782	3288
Asian	17	110	127	96	689	378	100	244	344	400	1158	747	95	200	295	379	784	583
MELAA	11	28	39	620	1760	1159	34	38	72	1435	1960	1671	31	12	43	1213	500	868
European or Other	572	2535	3108	638	3002	1785	1332	2771	4107	1488	3180	2325	570	890	1460	746	1133	942
Unknown	291	847	1146	-	-	-	526	586	1123	-	-	-	351	277	634	-	-	-
Total	**1806**	**7112**	**8930**	**1146**	**4788**	**2917**	**3019**	**6841**	**9880**	**1852**	**4380**	**3095**	**1510**	**2757**	**4273**	**1078**	**1908**	**1501**

[a]Excludes Taranaki DHB.
[b]Includes unknown sex.

Test positivity and population testing rates

2014 analysis by DHB, age group and sex

42 laboratories from all DHBs tested 404,355 specimens for chlamydia, of which 7.5% (30,321 specimens) from 28,331 cases tested positive. The population testing rate was 90 chlamydia tests per 1000 population. The specimen counts did not exclude repeat samples from the same individual.

Table 13 presents the 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 for 2014.

The highest population testing rates were in Lakes DHB and the Auckland region (109 and 103 per 1000 population, respectively), followed by the Wellington region and Southern DHB (98 and 94 per 1000 population, respectively).

Tairawhiti DHB had the highest percentage of positive tests for chlamydia (13.3%), followed by Hawke's Bay (12.5%) and Lakes (10.9%) DHBs. West Coast DHB and the Auckland region had the lowest percentages of positive tests (5.2% and 6.4%, respectively).

Table 14 presents the number of specimens tested for chlamydia, the number of tests per 1000 population, the percentage of specimens tested that were positive and the number of laboratory-confirmed cases, by age group and sex for 2014.

The national testing rate for males was 35 chlamydia tests per 1000 population, and the rate for females was 142 tests per 1000 population. The highest population testing rate was reported in the 20–24 years age group for both males and females (121 and 523 per 1000 population, respectively).

Males in the 15–19 years and 20–24 years age groups had the highest percentage of positive specimens (20.3% and 16.2%, respectively). Females in the Unknown, 15–19 years and 10–14 years age groups had the highest percentage of positive specimens (16.1%, 14.9% and 14.6%, respectively).

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, 2014

DHB	Total specimens	Tests per 1000 population	Specimens tested positive (%)[a]	Number of laboratory–confirmed cases [b]
Northland	10761	65	9.8	1000
Auckland region[c]	158,544	103	6.4	9457
Waikato	30,999	81	8.7	2535
Lakes	11,304	109	10.9	1182
Bay of Plenty	17,769	82	8.8	1497
Tairawhiti	4211	89	13.3	538
Taranaki	9032	79	6.5	519
Hawke's Bay	12,194	77	12.5	1416
Whanganui	4551	73	10.4	437
MidCentral	12,098	71	10.2	1184
Wellington region[d]	43,174	98	6.6	2615
Wairarapa	2392	56	8.9	207
Nelson Marlborough	9366	65	8.0	707
West Coast	2099	64	5.2	108
Canterbury	43,461	85	6.9	2770
South Canterbury	3278	56	8.7	266
Southern	29,122	94	6.8	1893
Total	**404,355**	**90**	**7.5**	**28,331**

[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.

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, 2014

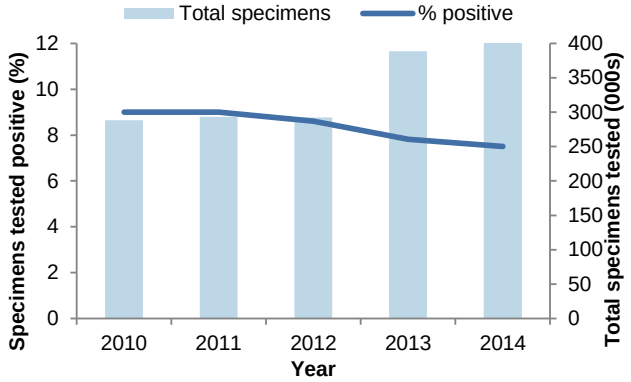
Age Group (years)	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
0–4	858	881	1758	6	6	6	5.7	6.8	6.3	34	48	84
5–9	56	203	260	0	1	1	0.0	3.0	2.3	0	3	3
10–14	406	3161	3574	3	22	12	9.9	14.6	14.0	37	419	457
15–19	9298	51,303	60,669	59	345	198	20.3	14.9	15.7	1806	7112	8930
20–24	19,704	81,651	101,473	121	523	318	16.2	8.9	10.3	3019	6841	9880
25–29	14,129	55,301	69,472	101	383	244	11.4	5.3	6.5	1510	2757	4273
30–34	8874	39,937	48,883	68	284	180	8.3	3.1	4.0	673	1167	1841
35–39	5879	29,019	34,946	46	208	131	7.1	2.2	3.0	377	591	973
40+	16,441	57,316	73,812	17	53	36	4.6	1.2	2.0	663	637	1303
Unknown	184	180	476	-	-	-	13.0	16.1	17.9	21	27	68
Total	**75,829**	**318,952**	**395,323**	**35**	**142**	**90**	**11.5**	**6.6**	**7.5**	**8140**	**19,602**	**27,812**

[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

All DHBs where data was available have been included in the trend analysis of test positivity rates (Figure 5). Between 2010 and 2014, the percentage of positive results recorded for all specimens tested for chlamydia decreased from 9.0% to 7.5%. From 2013 onwards there has been a large increase in the number of tests due to the inclusion of all DHBs in the analysis.

Figure 5. Percentage of positive specimens tested and total specimens tested for chlamydia, 2010–2014



Note: 2010–2012 data is from 15 DHBs. All DHBs provided data in 2013 and 2014.

Ethnicity analysis of test positivity and population testing rates

Ethnicity information was available for 90.3% (356,995/395,323) of chlamydia specimens from 19/20 DHBs. The specimen counts did not exclude repeat samples from the same individual.

Table 15 presents the number of specimens tested for chlamydia, the number of tests per 1000 population, the percentage of tested specimens that were positive and the number of laboratory–confirmed cases, by ethnicity and sex for 2014.

For males, the highest population testing rate was reported in the MELAA ethnic group (70 per 1000 population), followed by Māori and Pacific peoples ethnic groups (37 and 31 per 1000, respectively). For females, the highest population testing rates were also reported in the MELAA, Māori and Pacific peoples ethnic groups (231, 223 and 187 per 1000, 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, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	9751	61,943	71,723	37	223	132	21.0	11.9	13.2	1933	6870	8811
Pacific peoples	4317	26,172	30,499	31	187	110	23.7	11.3	13.0	955	2738	3696
Asian	5165	32,955	38,134	23	141	84	7.3	2.7	3.3	345	825	1172
MELAA	1610	4992	6606	70	231	148	8.1	2.2	3.7	115	103	219
European or Other	39,790	170,177	210,033	28	117	74	8.7	4.4	5.2	3223	7089	10,317
Unknown	15,196	22,713	38,328	-	-	-	11.0	9.1	9.9	1569	1977	3597
Total	**75,829**	**318,952**	**395,323**	**35**	**142**	**90**	**11.5**	**6.6**	**7.5**	**8140**	**19,602**	**27,812**

[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.

The highest percentage of positive tests for chlamydia in males was in the Pacific peoples ethnic group (23.7%), followed by the Māori ethnic group (21.0%). The pattern was different for females where the highest percentage of positive tests was in the Māori ethnic group (11.9%) followed by the Pacific peoples ethnic group (11.3%). Females in the Asian and MELAA ethnic groups had the lowest percentages of positive tests (2.7% and 2.2%, respectively).

Table 16 to Table 18 present the number of specimens tested for chlamydia, the number of tests per 1000 population, the percentage of specimens tested that were positive and the number of laboratory–confirmed cases, by ethnicity and sex for the age groups with the highest chlamydia rates for 2014 (15–19 years, 20–24 years and 25–29 years age groups).

In the 15–19 years age group, the highest population testing rate for males was reported in the Māori ethnic group (83 per 1000 population, followed by Pacific peoples (53 per 1000) and MELAA (52 per 1000) ethnic groups. For females in the same age group, the highest population testing rate was also reported in the Māori ethnic group (556 per 1000), followed by European or Other (319 per 1000) and Pacific peoples (258 per 1000) ethnic groups. In contrast to these testing rates, the highest percentages of positive specimens for both males and females were recorded in the Pacific peoples ethnic group (32.5% and 23.0%, respectively) followed by the Māori (32.3% and 22.1%, respectively) ethnic group. Males and females in the Unknown ethnic group had the next highest percentages of positive specimens (20.1% and 17.4% positive specimens, respectively). Both males and females in all other ethnic groups had percentages of positive specimens lower than the national average for this age group (Table 16).

In the 20–24 years age group, the highest population testing rate for males was reported in the MELAA ethnic group (155 per 1000 population), followed by the Māori and Pacific peoples ethnic groups (both 119 per 1000). For females in the same age group the highest population testing rate was reported in the Māori ethnic group (696 per 1000 population), followed by the European or Other (536 per 1000) and Pacific peoples (508 per 1000) ethnic groups. For males, the Pacific peoples ethnic group had the highest percentage of specimens that were positive (30.9%) followed by Māori (25.7%) and Unknown (15.0%) ethnic groups. Percentages of positive specimens followed the same pattern across the ethnic groups for females (16.8%, 14.1% and 10.0%, respectively) (Table 17).

In the 25–29 years age group, the highest population testing rate was reported in the

MELAA ethnic group for males (147 per 1000 population), followed by the Māori (100 per 1000) and European or Other (91 per 1000) ethnic groups. For females in the same age group the highest population testing rate was reported in the Māori ethnic group (547 per 1000 population) followed by the Pacific peoples (474 per 1000) and MELAA (430 per 1000) ethnic groups. As in the other two age groups, males in the Pacific peoples, Māori and Unknown ethnic groups had the highest percentage of positive specimens (24.7%, 18.4% and 11.9%, respectively). Percentages of positive specimens followed the same pattern across the ethnic groups for females (10.8%, 9.0% and 6.6%, respectively) (Table 18).

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, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	2221	14,024	16,254	83	556	313	32.3	22.1	23.5	685	2839	3526
Pacific peoples	757	3567	4326	53	258	155	32.5	23.0	24.6	230	753	984
Asian	255	1337	1593	14	84	47	6.7	8.9	8.5	17	110	127
MELAA	93	384	477	52	241	142	12.9	7.6	8.6	11	28	39
European or Other	4488	26,965	31,474	50	319	181	13.3	10.0	10.4	572	2535	3108
Unknown	1484	5026	6545	-	-	-	20.1	17.4	18.1	291	847	1146
Total	**9298**	**51,303**	**60,669**	**59**	**345**	**198**	**20.3**	**14.9**	**15.7**	**1806**	**7112**	**8930**

[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, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	2685	16,350	19,042	119	696	414	25.7	14.1	15.8	653	2168	2825
Pacific peoples	1296	6608	7905	102	508	307	30.9	16.8	19.1	374	1034	1409
Asian	1066	4912	5981	43	233	130	10.0	5.3	6.1	100	244	344
MELAA	368	951	1319	155	490	306	9.8	4.3	5.8	34	38	72
European or Other	10,657	46,711	57,392	119	536	325	13.3	6.3	7.6	1332	2771	4107
Unknown	3632	6119	9834	-	-	-	15.0	10.0	11.9	526	586	1123
Total	**19,704**	**81,651**	**101,473**	**121**	**523**	**318**	**16.2**	**8.9**	**10.3**	**3019**	**6841**	**9880**

[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, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	1654	10,531	12,186	100	547	340	18.4	9.0	10.3	290	883	1173
Pacific peoples	745	4904	5651	75	474	278	24.7	10.8	12.6	173	495	668
Asian	1274	6959	8234	51	273	163	8.2	3.1	3.9	95	200	295
MELAA	376	1030	1407	147	430	284	9.8	1.5	3.7	31	12	43
European or Other	6935	27,498	34,435	91	350	222	8.8	3.4	4.5	570	890	1460
Unknown	3145	4379	7559	-	-	-	11.9	6.6	8.8	351	277	634
Total	**14,129**	**55,301**	**69,472**	**101**	**383**	**244**	**11.4**	**5.3**	**6.5**	**1510**	**2757**	**4273**

[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 (number of people tested annually per 1000 population)

NHI information was available for 93.2% of all chlamydia specimens (89.6% of positive specimens) from 19/20 DHBs. The availability of NHI numbers varied by DHB, from 70.1% of specimens from Bay of Plenty DHB to 97.7% of specimens from both the Auckland region and Wairarapa DHB (see Quality of surveillance data). The NHI or patient ID number, where available, was used to remove all repeat tests for an individual in the calendar year, thus allowing reporting of the annual testing coverage rate. Table 19 presents the percentage of all tested specimens that were positive, the number of tests per 1000 population and the testing coverage rate by ethnicity and sex for 2014 across the 15–19 years, 20–24 years and 25–29 years age groups.

Coverage rates were lower than population testing rates for both males and females and across all age groups. For the 15–19 years age group, the male coverage rate was 19% lower and the female coverage rate 33% lower, than the respective population testing rates. For the 20–24 years age group the male coverage rate was 24% lower and the female coverage rate 27% lower, than the respective population testing rates. For the 25–29 years age group the male coverage rate was 27% lower and the female coverage rate 22% lower, than the respective population testing rates. Annual coverage rates for these three high risk age groups were between 48 and 92 per 1000 population (<10%) for males and between 231 and 380 per 1000 (23–38%) for females.

Different ethnic groups showed variation in the percentage decrease between population testing rates and coverage rates. For males, the Asian and MELAA ethnic groups showed the greatest percentage decrease, especially in the 20–24 years (33% and 29%, respectively) and 25–29 years (39% and 33%, respectively) age groups. The pattern was different for females with Māori and Pacific peoples ethnic groups showing the most percentage decrease across all age groups but with the greatest change in the 15–19 years age group (decreases of 38% and 36%, respectively).

Table 19. Percentage of chlamydia specimens tested that were positive, number of tests per 1000 population, and number of people tested per 1000 population by ethnicity, age group and sex, 2014

Ethnicity	Age group (years)[a]																	
	15–19						20–24						25–29					
	Specimens tested positive (%)[b]		Total tests per 1000 population		People tested per 1000 population[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		People tested per 1000 population[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		People tested per 1000 population[c]	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Māori	32.3	22.1	83	556	68	347	25.7	14.1	119	696	94	477	18.4	9.0	100	547	75	393
Pacific peoples	32.5	23.0	53	258	44	164	30.9	16.8	102	508	79	349	24.7	10.8	75	474	58	348
Asian	6.7	8.9	14	84	10	59	10.0	5.3	43	233	29	180	8.2	3.1	51	273	31	224
MELAA	12.9	7.6	52	241	44	167	9.8	4.3	155	490	110	364	9.8	1.5	147	430	99	346
European or Other	13.3	10.0	50	319	40	217	13.3	6.3	119	536	90	393	8.8	3.4	91	350	67	274
Unknown	20.1	17.4	-	-	-	-	15.0	10.0	-	-	-	-	11.9	6.6	-	-	-	-
Total	**20.3**	**14.9**	**59**	**345**	**48**	**231**	**16.2**	**8.9**	**121**	**523**	**92**	**380**	**11.4**	**5.3**	**101**	**383**	**74**	**297**

[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

2014 analysis

The site from which the specimen was taken was recorded for 99.2% (30,063/30,310 specimens) of positive specimens, based on chlamydia data from 41 laboratories. In males, the most common specimen site was urine (83.5%, 7390/8855 positive specimens). In females, the most common specimen sites were the cervix (47.5%, 10,150/21,378 positive specimens) and vagina (38.2%, 8159/21,378) (Table 20). The number of positive specimens from non-urogenital sites remains comparatively low (855/21,379, 4.0% for females and 679/8856, 7.7% for males). A total of 151 positive specimens were from the eye. Of these, 91 specimens (59.9%) were from 68 cases aged less than one year.

Trends in specimen site

Figure 6 and Figure 7 present the percentage of positive chlamydia tests by specimen site, from 2010 to 2014 for males and females (see Analytical methods). In males, there was a decrease in the number of positive results from urethral sites and an increase in positive results from urine samples. There was also a small increase in positive results from anorectal and throat sites. In females, there was a decline in positive results from both urethral sites and urine samples over this period. There was also a notable increase in positive results from vaginal samples and decrease in diagnosis from cervical samples, probably due to the increased use of vaginal swabs, including self-collection.

Table 20. Percentage of positive chlamydia tests by specimen site and sex, 2014

Specimen site[a]	Sex	
	Male (%)	Female (%)
Urethra	7.8	0.6
Vagina	-	38.2
Cervix[b]	0.0	47.5
Penis	0.4	-
Anorectal	4.7	0.4
Eye	0.8	0.4
Urine	83.5	8.8
Urogenital[c]	0.0	0.1
Throat	1.7	0.2
Other	0.4	3.0

[a] Includes data from 41 laboratories.
[b] One cervical specimen was male, assumed transgender.
[c] Pooled specimens from more than one site.

Figure 6. Specimen site, as a percentage of all positive chlamydia tests in males, 2010–2014

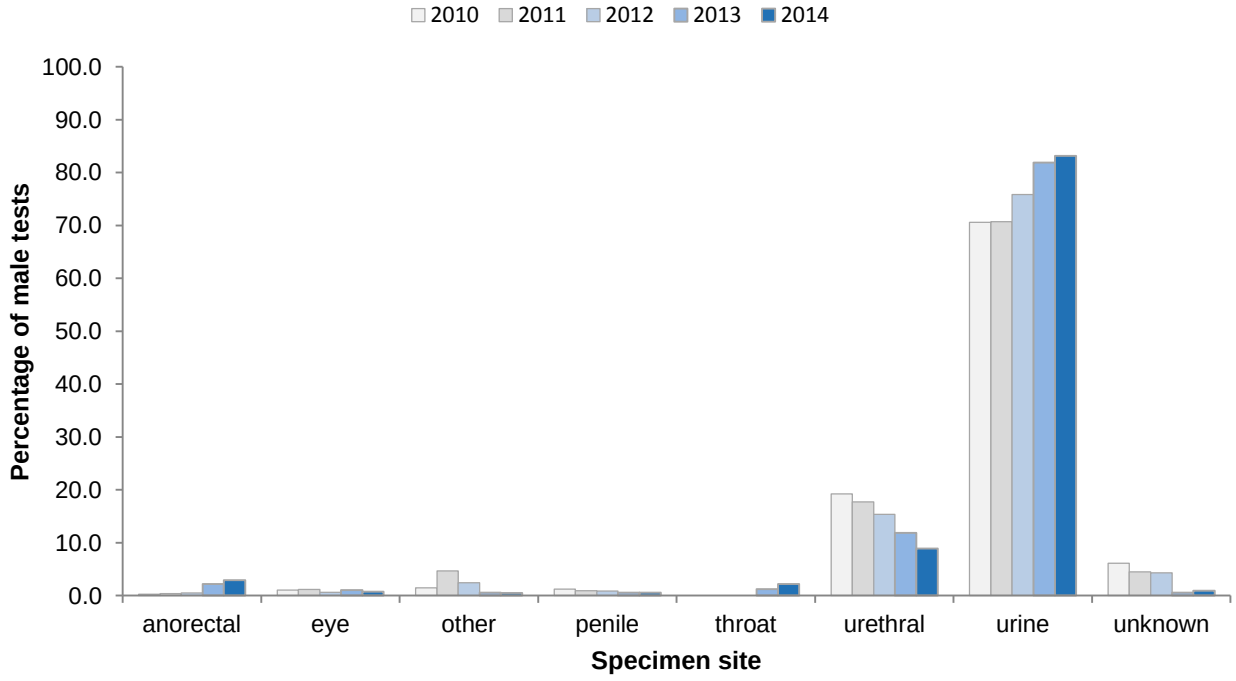
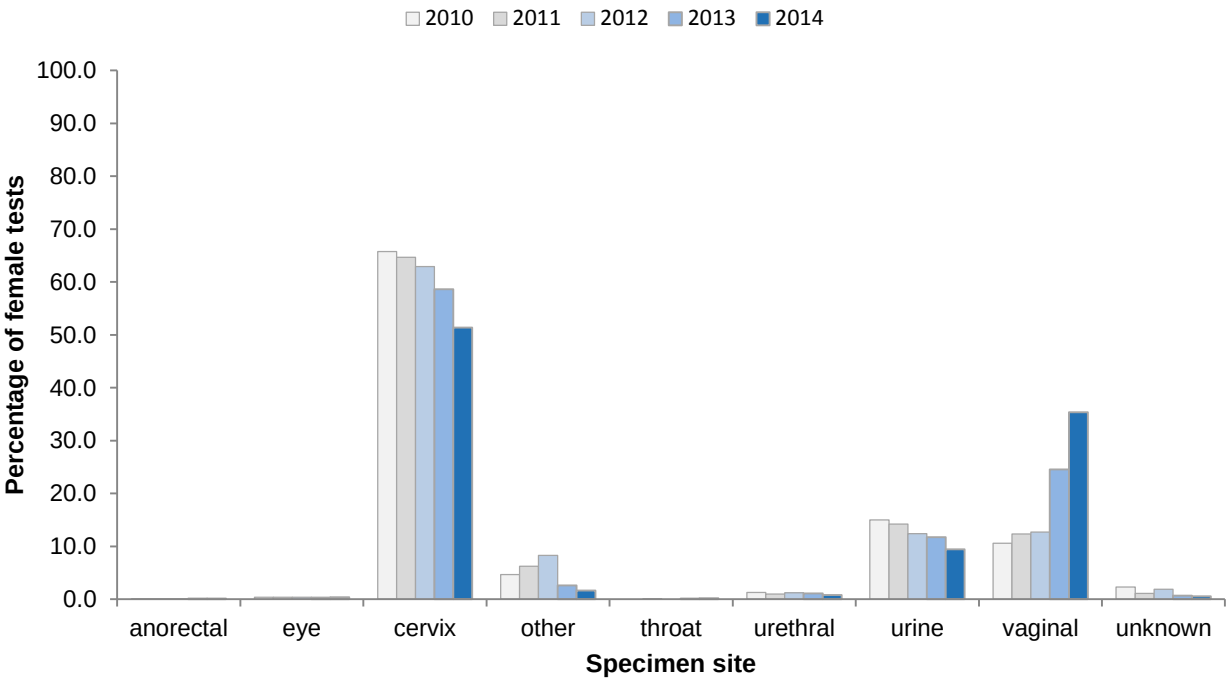


Figure 7. Specimen site, as a percentage of all positive chlamydia tests in females, 2010–2014



Clinic surveillance of chlamydia

National analysis

2014 analysis

In 2014, the number of chlamydia cases reported by SHCs and FPCs were 4801 and 2885 cases respectively (Table 21).

Table 21. Chlamydia case numbers by clinic type, 2014

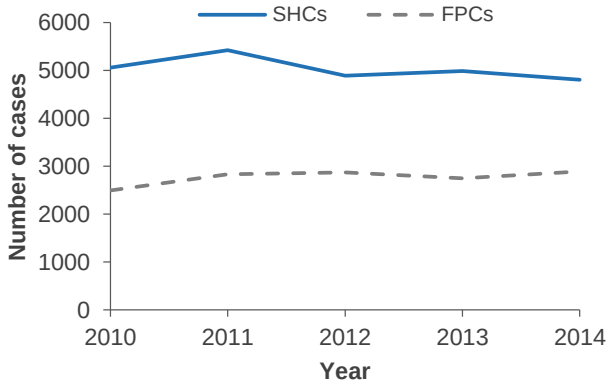
Clinic type	Total number of cases
SHC	4801
FPC	2885
Total	**7686**

Trends in national totals

Between 2013 and 2014, chlamydia clinic case numbers reported by SHCs decreased by 3.7% (from 4987 to 4801 cases). By contrast, chlamydia clinic case numbers reported by FPCs increased by 5.1% (from 2745 to 2885 cases).

From 2010 to 2014, chlamydia case numbers reported by SHCs decreased by 5.0% (from 5056 to 4801 cases) (Figure 8). By contrast, the number of chlamydia cases reported by FPCs increased by 15.7% (from 2494 to 2885 cases) from 2010 to 2014.

Figure 8. Chlamydia cases numbers by clinic type, 2010–2014



DHB counts

2014 analysis

Clinics in 19 DHBs contributed to chlamydia surveillance in 2014. The numbers of chlamydia cases in each clinic type by DHB are presented in Table 22. The highest case numbers of chlamydia in SHCs were seen in the Auckland region (1339 cases) and in Bay of Plenty DHB (666 cases).

Table 22. Chlamydia case numbers by clinic type and DHB, 2014

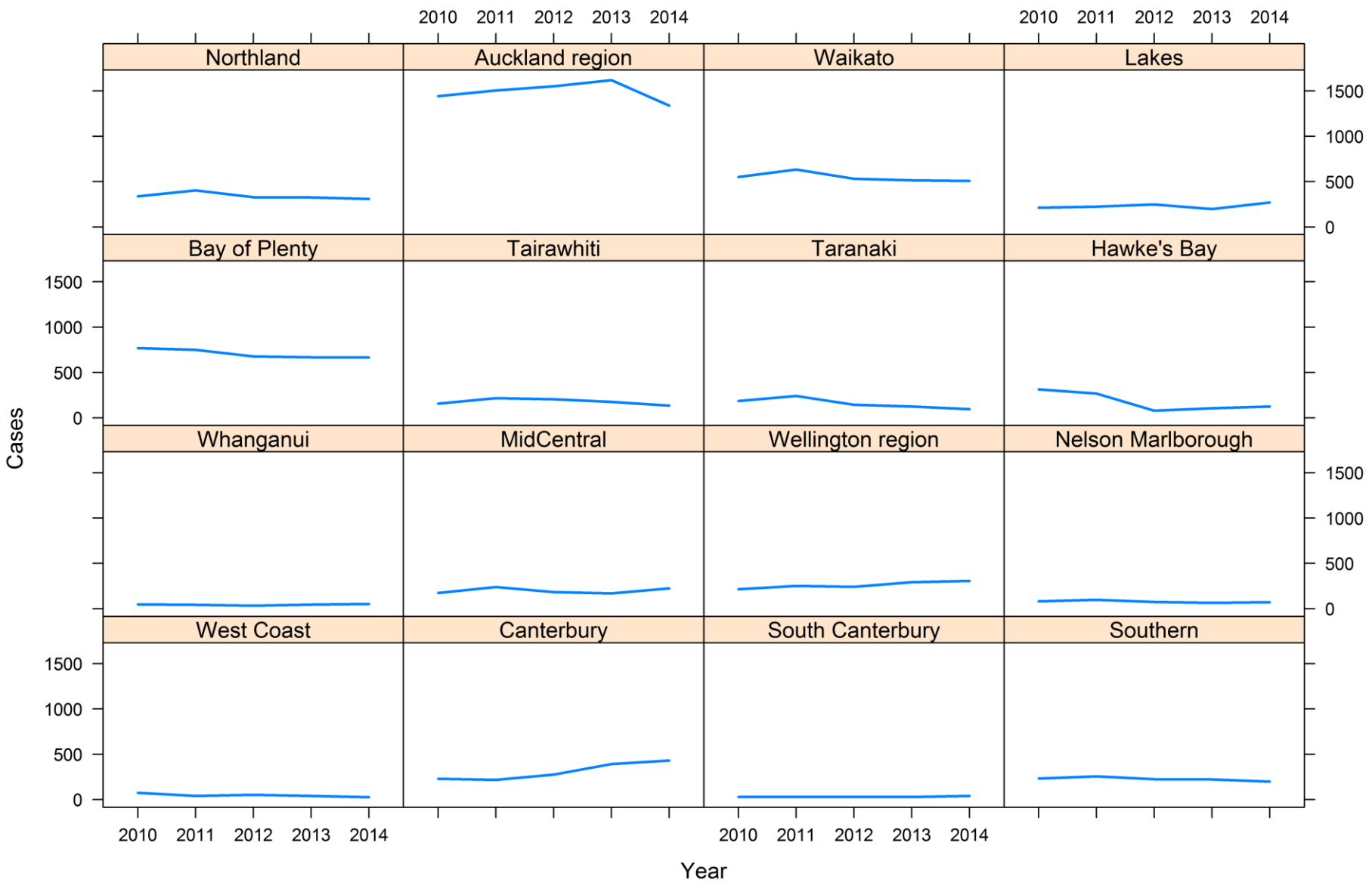
DHB	Clinic type		Total
	SHC	FPC	
Northland	309	115	424
Auckland region[a]	1339	792	2131
Waikato	508	432	940
Lakes	270	0	270
Bay of Plenty	666	60	726
Tairawhiti	136	122	258
Taranaki	96	65	161
Hawke's Bay	124	0	124
Whanganui	53	76	129
MidCentral	224	0	224
Wellington region[b]	306	346	652
Nelson Marlborough	71	257	328
West Coast	27	9	36
Canterbury	432	330	762
South Canterbury	41	15	56
Southern	199	266	465

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

Trends in DHB counts

Chlamydia case numbers reported by SHCs from 2010 to 2014 are presented by DHB in Figure 9. Variations in trends by DHB are seen such as increasing case numbers over the five-year period in the Wellington region and Canterbury DHB, and decreasing case numbers in the Auckland region, and Bay of Plenty, Taranaki and Hawke's Bay DHBs.

Figure 9. Chlamydia case numbers in SHCs by DHB, 2010–2014



Sex, age and ethnicity distribution of chlamydia cases

2014 analysis

Sex was recorded for 99.8% (7674/7686) of chlamydia cases in 2014. More cases of chlamydia were reported in females than males across both clinic types. The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2014, the male to female ratio of attendees at FPCs was 1:23). Table 23 presents the number of cases of chlamydia by sex and clinic type for 2014.

Table 23. Number of cases of chlamydia by sex and clinic type, 2014

Sex	Clinic type	
	SHC	FPC
Male	2364	473
Female	2430	2407
Total[a]	**4801**	**2885**

[a] Includes unknown sex.

Age was recorded for all but five chlamydia cases in 2014. A large proportion of the reported cases of chlamydia were aged less than 25 years: 60.3% (2891/4796) in SHCs and 82.5% (2379/2885) in FPCs. The mean age of chlamydia cases was 25.0 years in SHCs and 21.0 years in FPCs.

The number of males with chlamydia was highest in the 20–24 years age group in both SHCs (817 cases, 34.6%) and in FPCs (218 cases, 46.1%). For females, chlamydia case numbers were highest in the 15–19 years age group across both clinic types: 930 cases (38.3%) in SHCs and 1118 cases (46.4%) in FPCs. Figure 10 and Figure 11 present the clinic visit counts by age group and sex reported by SHCs and FPCs in 2014.

Figure 10. Confirmed chlamydia cases reported by SHCs by age group and sex, 2014

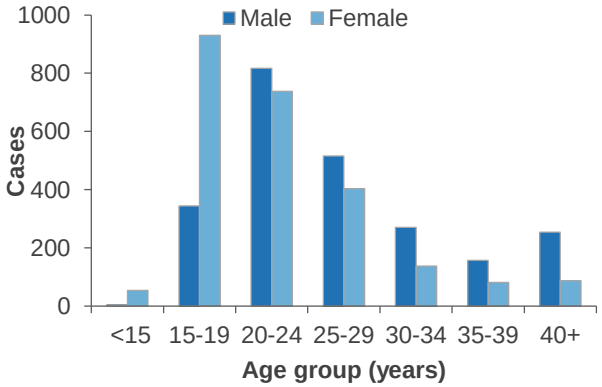


Figure 11. Confirmed chlamydia cases reported by FPCs by age group and sex, 2014

Ethnicity was recorded by SHCs for 98.5% (4727/4801) of the reported chlamydia cases (Table 24). The highest percentage of cases were of European ethnicity (45.6%, 2156 cases), followed by Māori (36.8%, 1738 cases), Other (9.5%, 450 cases) and Pacific peoples (8.1%, 383 cases) ethnicity. Ethnicity was recorded by FPCs for 97.4% (2811/2885) of the reported chlamydia cases. The highest percentage of cases were of European ethnicity (50.6%, 1423 cases), followed by Māori (34.9%, 982 cases), Pacific peoples (10.5%, 296 cases) and Other (3.9%, 110 cases) ethnicity.

Table 24. Confirmed chlamydia cases by ethnicity and clinic setting, 2014

Ethnicity	Clinic type	
	SHC	FPC
European	2156	1423
Māori	1738	982
Pacific peoples	383	296
Other	450	110
Unknown	74	74
Total	**4801**	**2885**

Trends in sex, age and ethnicity

Between 2010 and 2014, the number of confirmed chlamydia cases in males reported by SHCs decreased in the 15–19 years group. Case numbers were stable in the 20–24 years age group, and increased in all other age groups. For females, case numbers decreased in the 15–19 years, 20–24 years and 30–34 years age groups. Increases were seen in most of the older age groups (25–29 years, 35–39 years and 40 years and over age groups) (Figure 12).

A different trend was seen in FPCs where case numbers increased in the 15–19 years age group for males and females, and in the 20–24 years age group for males and the 25–29 years age group for females (Figure 13).

Figure 12. Chlamydia case numbers in SHCs by sex and age group, 2010–2014

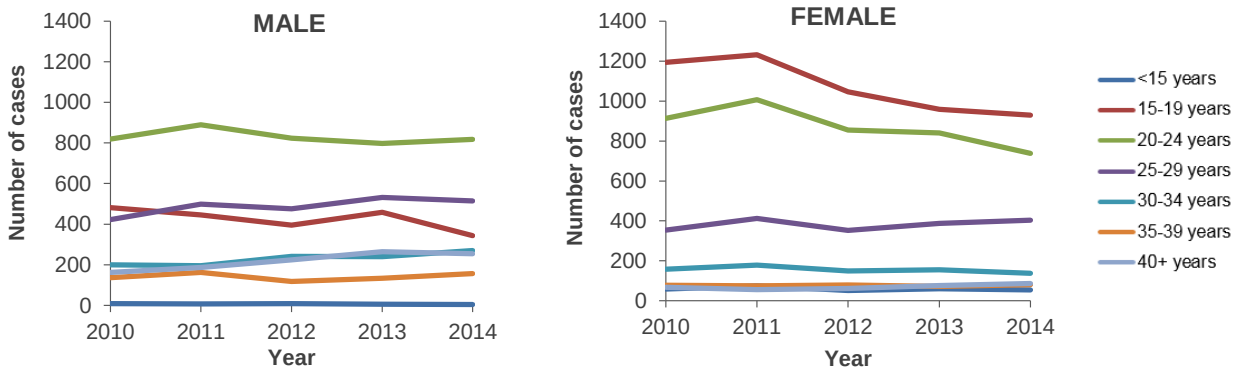
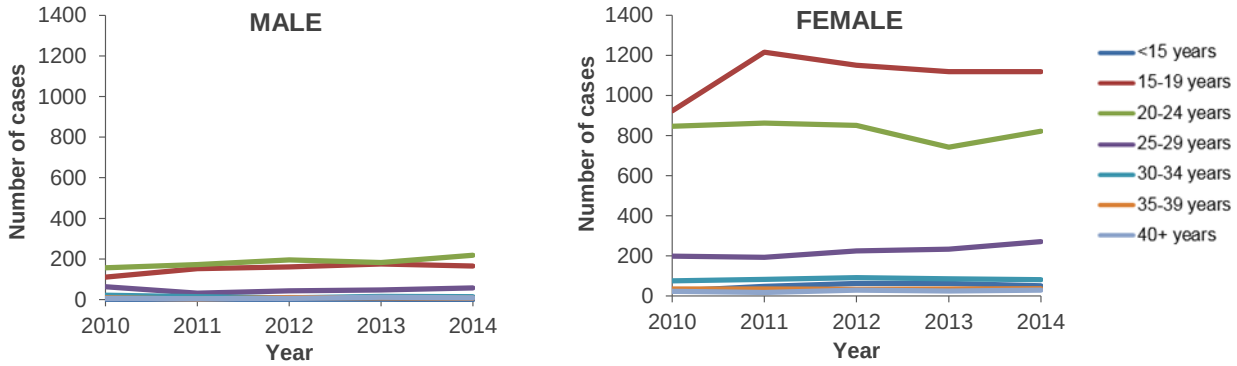


Figure 13. Chlamydia case numbers in FPCs by sex and age group, 2010–2014



In SHCs, there was a notable increase in the number of people diagnosed with chlamydia in the Other ethnic group from 2010 to 2014, and a decrease in Māori and Pacific peoples ethnic groups (Figure 14).

In FPCs, there was an increase in the numbers of people diagnosed with chlamydia in all ethnic groups from 2010 to 2014, except for the Pacific peoples ethnic group, in which numbers were stable (Figure 15).

Figure 14. Chlamydia case numbers reported from SHCs by ethnicity, 2010–2014

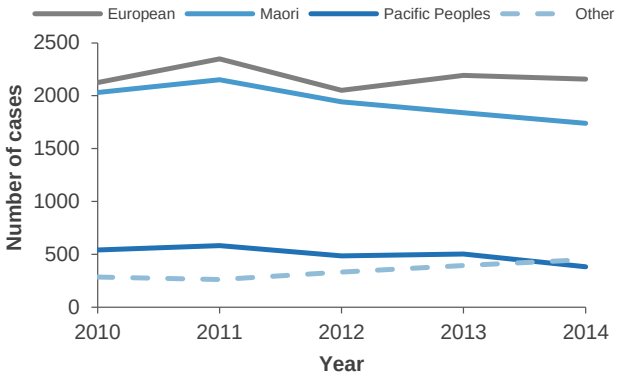
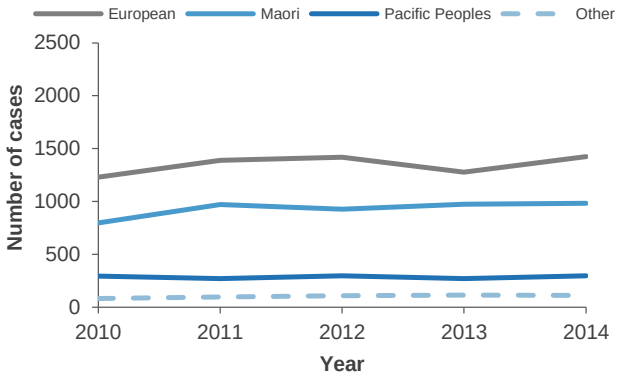


Figure 15. Chlamydia case numbers reported from FPCs by ethnicity, 2010–2014



Site of infection

2014 analysis

In 2014, chlamydia cases were most commonly confirmed from a sample taken at a urogenital site in both clinic types: 98.1% of SHC cases (4708 cases) and 97.7% of FPC cases (2820 cases).

Table 25 presents the number of confirmed chlamydia cases by site of infection and clinic setting in 2014.

Table 25. Chlamydia case numbers by site of infection and clinic setting, 2014

Site	Clinic type	
	SHC	FPC
Urogenital	4708	2820
Pelvic inflammatory disease/epididymitis	50	72
Other site	68	4
Total	**4801**	**2885**

Complicated infections

2014 analysis

Complicated infections (epididymitis in males and pelvic inflammatory disease (PID) in females) were reported for 1.0% (50/4801) of chlamydia cases in SHCs and 2.5% (72/2885) of cases in FPCs.

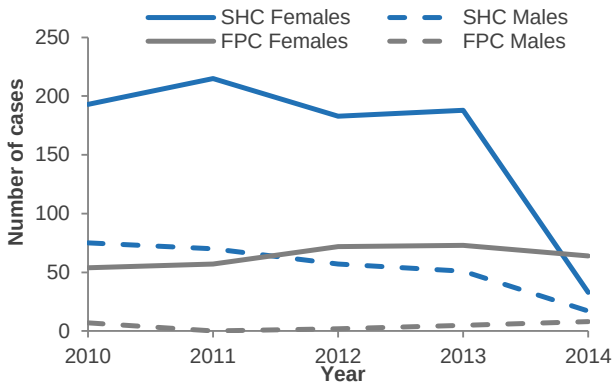
A total of 25 males (17 in SHCs and 8 in FPCs) were reported with epididymitis, with 76.0% (19 cases) aged less than 25 years. Ethnicity was recorded for all male epididymitis cases. The highest percentage of cases were of European ethnicity (56.0%, 14 cases), followed by Māori (36.0%, 9 cases), and Pacific peoples (8.0%, 2 cases) ethnicity.

A total of 97 females (33 in SHCs and 64 in FPCs) were reported with PID, with 70.1% (68 cases) aged less than 25 years. Of the 95 cases (97.9%) where ethnicity was recorded, the highest percentage of cases were of European ethnicity (45.3%, 43 cases), followed by Māori (41.1%, 39 cases), Pacific peoples (8.4%, 8 cases) and Other (5.3%, 5 cases) ethnicity.

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 2010 to 2014. Notably, the numbers of complicated infections seen in SHCs have decreased by more than three quarters in both males and females (75 to 17 cases and 193 to 33 cases, respectively). There has been little change in the numbers of complicated infections seen in FPCs.

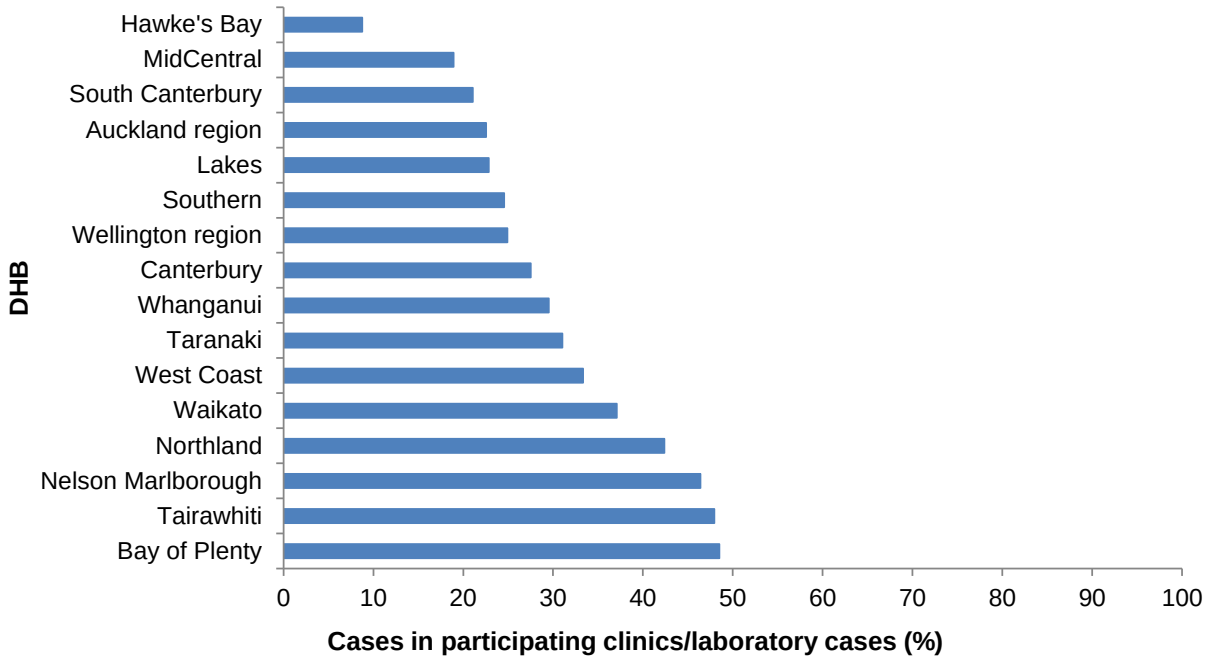
Figure 16. Numbers of epididymitis cases in males and PID cases in females by clinic type, 2010–2014



Comparison of laboratory and clinic surveillance

The number of cases seen in clinics as a proportion of laboratory cases are presented in Figure 17 for DHBs that meet the selection criteria for chlamydia laboratory reporting (see Analytical methods) and have clinics that participate in the STI surveillance programme. Chlamydia cases that were not reported from a participating clinic are most likely to have been diagnosed in a primary care facility. The highest proportion of chlamydia cases reported by participating clinics was in the Bay of Plenty DHB (48.5%), followed by Tairawhiti (48.0%) and Nelson Marlborough (46.4%) DHBs. The lowest proportion of chlamydia cases reported by participating clinics were in Hawke's Bay (8.8%) and MidCentral (18.9%) DHBs.

Figure 17. Cases of chlamydia seen in participating clinics as a proportion (%) of all positive laboratory tests by DHB, 2014



GONORRHOEA

THE SCIENCE BEHIND THE TRUTH

GONORRHOEA

Key findings

- In 2014, the estimated national rate of gonorrhoea was 70 cases per 100,000 population.
- The 2014 rate decreased significantly from 2013, but remained higher than the estimated rates from 2009 to 2011.
- The highest rate of gonorrhoea was reported in Tairawhiti DHB, with 316 cases per 100,000 population – more than four and a half times the estimated national rate.
- The national estimated rate for males was higher than for females (77 and 62 per 100,000 population, respectively).
- Gonorrhoea rates were stable or lower for most age groups in 2014 compared with 2013.
- One case of laboratory diagnosed gonorrhoea was reported in the less than one year age group.
- An increasing number of gonorrhoea cases were diagnosed via urine specimens in males.
- The number of pharyngeal gonorrhoeal infections diagnosed in men at SHCs increased notably from 2013 to 2014.
- One *N. gonorrhoeae* isolate with decreased susceptibility to ceftriaxone was identified in Canterbury DHB in 2014.
- In those aged 15–29 years the highest estimated gonorrhoea rates were reported in the Māori and Pacific peoples ethnic groups.
- Māori females aged 15–19 years reported the highest estimated rate, more than three times the national estimate.
- Annual population testing rates were highest for both males and females in the 20–24 years age group.
- Māori females in the 20–24 years age group had the highest testing rate across the ethnic groups.
- Annual testing coverage rates in the at risk age groups suggest that <10% of males and 23–38% of females had at least one annual test.

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 [15]. Untreated gonococcal infection may be associated with long-term serious sequelae, including PID in females, epididymo-orchitis in males and severe conjunctivitis in neonates [14].

Laboratory surveillance of gonorrhoea

National and DHB analysis

2014 analysis

All DHBs except Northland met the criteria for gonorrhoea reporting in 2014, hence all national rates calculated are estimated rates. These DHBs reported positive tests from 3038 cases. The estimated national gonorrhoea rate was 70 per 100,000 population (95% CI [66, 74]), a significant decrease from the 2013 estimated rate of 78 per 100,000 population. See Data collection for detail about new data processing methods introduced in 2013 that allow for exclusion of repeat tests.

The highest numbers of laboratory-confirmed gonorrhoea cases were seen in the Auckland region (1271 cases) and in Waikato DHB (371 cases). There was wide variation in the population rates by DHB from 316 per 100,000 population in Tairawhiti DHB to 23 per 100,000 population in Taranaki and Wairarapa DHBs (Table 26). Although most DHBs reported a decrease or small, non-signifcant increase in rates from 2013 to 2014, Waikato, MidCentral, Taranaki and Nelson Marlborough DHBs showed significant increases in rates (Table 26).

Table 26. Number of gonorrhoea laboratory-confirmed cases and population rates by DHB, 2013–2014

DHB	Number of laboratory-confirmed cases		Rate per 100,000 population		Rate change[d,e]
	2014	2013	2014	2013	
Northland[a]	-	-	-	-	-
Auckland region[b]	1271	1596	82	106	↓↓
Waikato	371	306	97	81	↑↑
Lakes	132	145	128	141	↓
Bay of Plenty	123	145	57	67	↓
Tairawhiti	149	187	316	398	↓↓
Taranaki	27	9	23	8	↑↑
Hawke's Bay	194	243	122	153	↓↓
Whanganui	36	23	58	37	↑
MidCentral	132	51	78	30	↑↑
Wellington region[c]	225	262	51	60	↓
Wairarapa	10	12	23	28	↓
Nelson Marlborough	47	17	33	12	↑↑
West Coast	2	7	-	21	-
Canterbury	224	242	44	48	↓
South Canterbury	15	7	26	12	↑
Southern	80	92	26	30	↓
Total	**3038**	**3344**	**70**	**78**	↓↓

[a] Data incomplete.

[b] Waitemata, Auckland and Counties Manukau DHBs.

[c] Hutt Valley and Capital & Coast DHBs.

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

[e] 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.

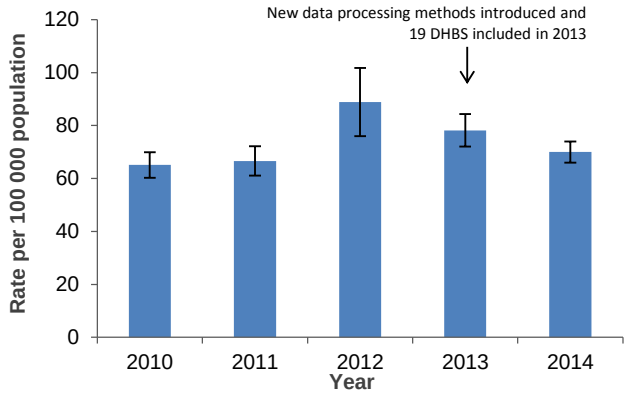
Trends in laboratory diagnoses

1. National rate trend analysis

All DHBs where data was available were included in the national estimated rate trend analysis for gonorrhoea (see Analytical methods). From 2013 to 2014, the estimated national gonorrhoea rate decreased significantly (10.5%) from 78 to 70 per 100,000 population. However from 2010 to 2014, the rate increased (7.4%) from 65 to 70 per 100,000. Introduction of nucleic acid amplification (NAAT) testing for gonorrhoea may explain this observed increase (see Interpreting the results). Estimated national gonorrhoea rates from 2010 to 2014, with a 95% confidence interval indicated, are shown in Figure 18.

Comparison of 2013–2014 estimated national and DHB rates with the 2010–2012 estimated rates should be interpreted with caution due to the introduction of a process to exclude repeat tests within a defined period for an individual and the addition of DHBs that were not previously reporting. Overall, 26.6% (1117) of positive specimens were excluded in 2014 as they were considered to be repeat tests.

Figure 18. Estimated national gonorrhoea rate, 2010–2014



Note: Estimated rates with 95% CIs were calculated for 2009–2012 based on data from 17 DHBs and for 2013–2014 on data from 19/20 DHBs. 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.

However, to directly compare 2013–2014 data with previous years, annual rates were estimated for 2013–2014 using only the 16 DHBs (17 DHBs prior to the amalgamation of Otago and Southland in May 2010) that contributed data from 2010–2012 and including repeat tests for 2013–2014. The estimated rate for 2014 (100 per 100,000) was significantly lower than the 2013 estimate (108 per 100,000) and was significantly higher than the estimates for 2010–2012 (66–88 per 100,000).

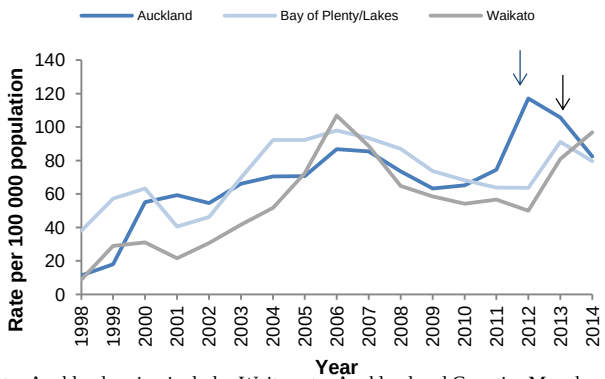
2. Long term trend analysis

Laboratory data has been collected from laboratories in the Auckland, Waikato and Lakes/Bay of Plenty regions since 1998. The three areas show the same long term trend as far as 2009, with an increase in gonorrhoea rates from 1998 to 2006 followed by a steady decline. The Auckland region showed an increase in rates from 2010 until 2012, followed by a further steady decline. In contrast the decline in rates in Lakes/Bay of Plenty and Waikato continued until 2012, followed by an increase in rates from 2012 to 2013. This increase persisted in the Waikato region with a further increase (from 81 to 97 per 100,000, 19%) from 2013 to 2014, whereas there was a decrease in rates from 2013 to 2014 in the Lakes/Bay of Plenty region. Figure 19 presents gonorrhoea rates in these three areas from 1998 to 2014.

3. Individual DHB trend analysis

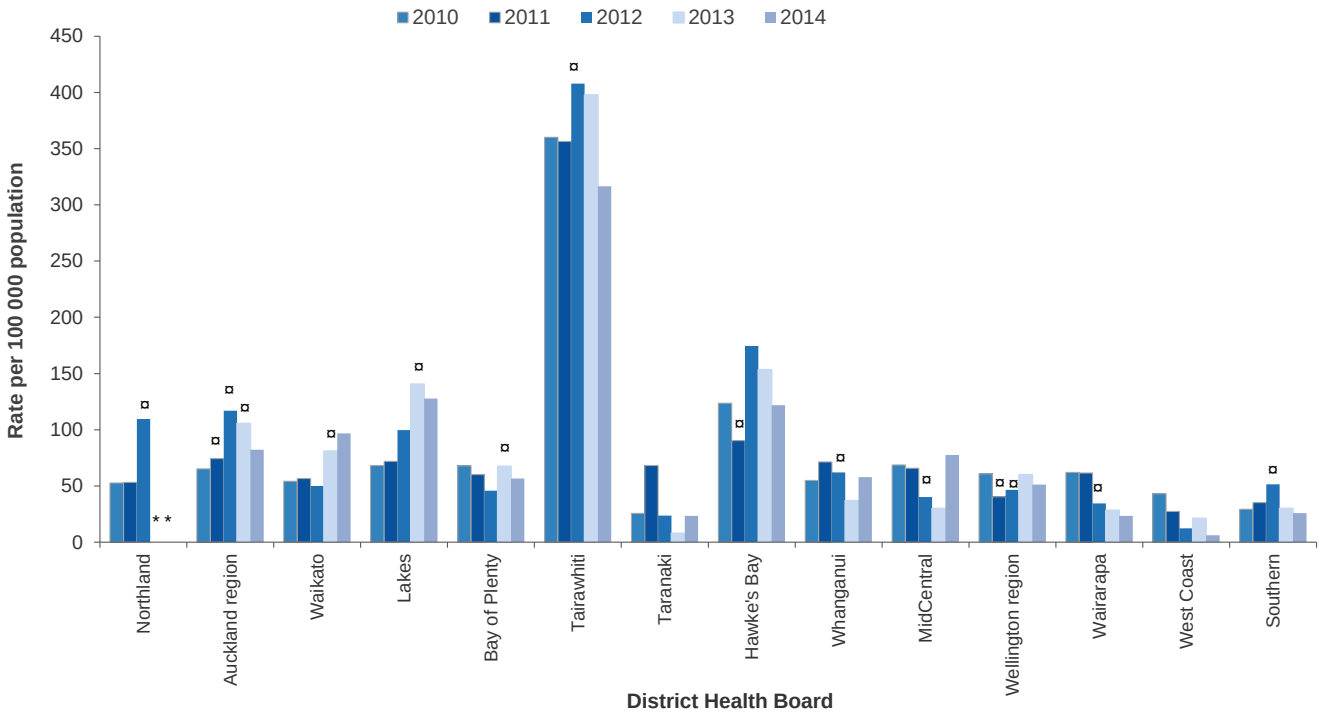
Seventeen DHBs met the selection criteria for the individual DHB trend analysis (see Analytical methods). From 2010 to 2014, the gonorrhoea rate varied among DHBs and across years (Figure 20). Introduction of NAAT testing for gonorrhoea may have contributed to increases observed in some DHBs (see Interpreting the results). The most notable observation is that, despite decreases in rates in recent years, there is a continued high gonorrhoea rate in Tairawhiti DHB, compared with other DHBs and regions. Other notable trends in this period were increasing rates in Waikato and Lakes DHBs, and decreasing rates in Wairarapa and West Coast DHB.

Figure 19. Gonorrhoea rates in selected regions, 1998–2014



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.

Figure 20. Gonorrhoea rates by DHB, 2010–2014



¤ Introduction of NAAT testing (see Surveillance methods).

Age and sex distribution of laboratory-confirmed cases

2014 analysis

Age and sex information was recorded for 98.6% of the laboratory-confirmed gonorrhoea cases. The national rate for males (77 per 100,000 population, 1633 cases) was higher than the national rate for females (62 per 100,000 population, 1367 cases) (Table 27). Both of these rates were lower than the respective 2013 rates for males (83 per 100,000) and females (72 per 100,000).

The highest rate of gonorrhoea in males was reported for Tairawhiti DHB (248 per 100,000, 57 cases), followed by Auckland region (105 per 100,000, 790 cases) and Hawke's Bay DHB (98 per 100,000, 75 cases). In females the highest rate of gonorrhoea was also reported in Tairawhiti DHB (381 per 100,000, 92 cases), followed by Lakes (155 per 100,000, 82 cases) and Hawke's Bay (144 per 100,000, 119 cases) DHBs.

The mean age of laboratory-confirmed gonorrhoea cases was 25.3 years (median age 22 years, range 0–94 years). Where age was known, 57.5% (1718/2990) of positive cases were aged 15–24 years. The highest national age-specific rate of laboratory-confirmed gonorrhoea occurred in the 15–19 years age group for females (383 per 100,000 population, 582 cases) and in the 20–24 years age group for males (266 per 100,000 population, 455 cases) (Figure 21).

The highest DHB age-specific rate was in the 15–19 years age group from Tairawhiti DHB (2343 per 100,000 population, 80 cases). Table 28 presents the number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and age group for 2014. Of the three laboratory confirmed gonorrhoea cases in the 0–4 years age group, one case was reported in the less than one year age group.

Table 27. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and sex, 2014

DHB	Number of laboratory-confirmed cases				Rate per 100,000 population[d]		
	Male	Female	Unknown	Total	Male	Female	Total
Northland[a]	-	-	-	-	-	-	-
Auckland region[b]	790	473	8	1271	105	60	82
Waikato	158	213	0	371	84	109	97
Lakes	49	82	1	132	97	155	128
Bay of Plenty	49	63	11	123	47	56	57
Tairawhiti	57	92	0	149	248	381	316
Taranaki	13	14	0	27	23	24	23
Hawke's Bay	75	119	0	194	98	144	122
Whanganui	16	20	0	36	53	63	58
MidCentral	60	70	2	132	73	80	78
Wellington region[c]	138	86	1	225	65	38	51
Wairarapa	6	4	0	10	29	-	23
Nelson Marlborough	23	24	0	47	33	33	33
West Coast	2	0	0	2	-	-	-
Canterbury	144	74	6	224	56	29	44
South Canterbury	11	2	2	15	38	-	26
Southern	42	31	7	80	28	20	26
Total	**1633**	**1367**	**38**	**3038**	**77**	**62**	**70**

[a] Data incomplete.
[b] Waitemata, Auckland and Counties Manukau DHBs.
[c] Hutt Valley and Capital & Coast DHBs.
[d] Rates have not been calculated where there were fewer than five cases in any category.

Table 28. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and age group, 2014

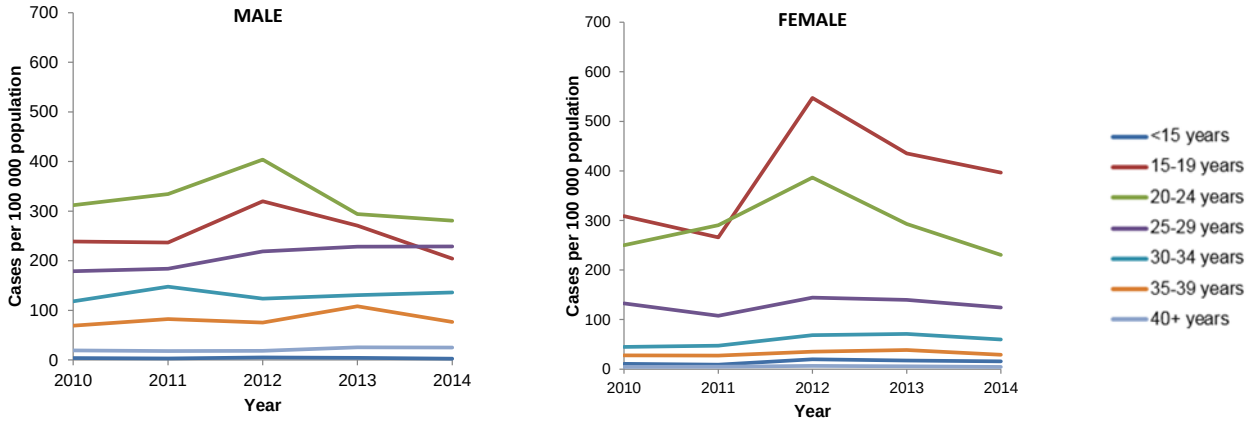
DHB	Age group (years)[d]																					
	0–4		5–9		10–14		15–19		20–24		25–29		30–34		35–39		40+		Unknown		Total	
	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000	Cases	Rate per 100,000
Northland[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Auckland region[b]	1	-	0	-	16	16	265	241	360	289	245	210	150	136	71	71	163	25	0	-	1271	82
Waikato	2	-	0	-	11	42	158	566	84	306	51	215	18	82	16	73	31	17	0	-	371	97
Lakes	0	-	0	-	7	91	77	1080	21	330	13	220	5	90	5	83	4	-	0	-	132	128
Bay of Plenty	0	-	0	-	5	33	26	183	36	310	27	252	12	111	3	-	4	-	10	-	123	57
Tairawhiti	0	-	0	-	4	103	80	2343	39	1347	19	735	2	-	1	-	4	-	0	-	149	316
Taranaki	0	-	0	-	1	-	4	-	6	91	1	-	4	-	4	-	0	-	7	-	27	23
Hawke's Bay	0	-	0	-	20	173	90	818	45	514	20	255	12	154	2	-	5	6	0	-	194	122
Whanganui	0	-	0	-	0	-	10	243	7	200	5	156	4	-	0	-	1	-	9	-	36	58
MidCentral	0	-	0	-	2	-	41	319	46	360	16	159	12	-	3	-	4	-	8	-	132	78
Wellington region[c]	0	-	0	-	4	-	60	203	63	173	45	145	20	66	17	57	16	8	0	-	225	51
Wairarapa	0	-	0	-	0	-	3	-	2	-	3	-	1	-	0	-	1	-	0	-	10	23
Nelson Marlborough	0	-	0	-	0	-	12	140	16	245	9	136	3	-	2	-	5	6	0	-	47	33
West Coast	0	-	0	-	0	-	2	-	0	-	0	-	0	-	0	-	0	-	0	-	2	-
Canterbury	0	-	0	-	4	-	51	144	55	145	32	95	11	35	15	48	51	21	5	-	224	44
South Canterbury	0	-	0	-	0	-	1	-	5	174	4	-	2	-	0	-	1	-	2	-	15	26
Southern	0	-	0	-	0	-	21	92	32	128	8	43	7	39	0	0	5	3	7	-	80	26
Total	**3**	**-**	**0**	**-**	**74**	**26**	**901**	**298**	**817**	**258**	**498**	**176**	**263**	**97**	**139**	**52**	**295**	**15**	**48**	**-**	**3038**	**70**

[a] Data incomplete.
[b] Waitemata, Auckland and Counties Manukau DHBs.
[c] Hutt Valley and Capital & Coast DHBs.
[d] Rates have not been calculated where there were fewer than five cases in any category.

Trends in age and sex distribution of gonorrhoea cases

From 2010 to 2014, there was a 32.3% increase in the rate of gonorrhoea in males in the 40 years and over age group (from 19 to 25 cases per 100,000) and a 27.8% increase in the 25–29 years age group (from 179 to 229 cases per 100,000). In females, there was a 34.2% increase in the 30–34 years age group (from 45 to 60 cases per 100,000 population) and a 28.4% increase in the rate for females in the 15–19 years age group (from 309 to 396 cases per 100,000). Small to moderate changes in gonorrhoea rates were observed in all other age groups for both sexes over this time. Gonorrhoea rates per 100,000 population by age group and sex from 2010 to 2014 are presented in Figure 21.

Figure 21. Gonorrhoea rates per 100,000 population by sex and age group, 2010–2014



Note: Estimated rates were calculated for 2010–2012 based on data from 17 DHBs. All DHBs except Northland were included in 2013 and 2014. 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

2014 analysis

Ethnicity information was able to be retrieved using the NHI from all DHBs except Taranaki and Northland (see Analytical methods), and was recorded for 78.9% (2377/3011) of laboratory-confirmed gonorrhoea cases. The ethnicity analyses should be interpreted with caution due to the varying levels of data completeness by DHB (see Quality of surveillance data).

The highest rate of gonorrhoea in males was reported in the Māori ethnic group (154 per 100,000, 374 cases), followed by Pacific peoples (139 per 100,000, 188 cases) and MELAA (128 per 100,000, 29 cases) ethnic groups. The highest rate of gonorrhoea in females was also reported in the Māori ethnic group (267 per 100,000, 685 cases) followed by Pacific peoples (129 per 100,000, 178 cases) and MELAA (28 per 100,000, 6 cases) ethnic groups.

Thirty-five percent (1059 cases) of positive cases were from the Māori ethnic group, and 26.0% (783 cases) were from the European or Other ethnic group. Table 29 presents the number of laboratory-confirmed gonorrhoea cases, and gonorrhoea population rates by ethnic group and sex for 2014.

One laboratory-confirmed gonorrhoea case was reported in the less than one year age group, it was from the Māori ethnic group and the specimen site was eye.

Table 30 presents the number of laboratory-confirmed gonorrhoea cases, and gonorrhoea population rates by ethnic group and sex for the age groups with the highest gonorrhoea rates for 2014 (15–19 years, 20–24 years and 25–29 years age groups). Across these age groups, the highest rates were reported in the Māori (993, 635 and 387 per 100,000, respectively) and Pacific peoples (440, 515 and 244 per 100,000, respectively) ethnic groups. The highest age and sex-specific rate occurred in the 15–19 years age group in females of Māori ethnicity (1401 per 100,000, 328 cases). 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 29. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by ethnicity and sex, 2014

Ethnicity	Number of laboratory-confirmed cases[a]				Rate per 100,000 population[a]		
	Male	Female	Unknown	Total	Male	Female	Total[b]
Māori	374	685	0	1059	154	267	212
Pacific peoples	188	178	0	366	139	129	134
Asian	92	42	0	134	42	18	30
MELAA	29	6	0	35	128	28	79
European or Other	507	276	0	783	38	20	28
Unknown	430	166	38	634	-	-	-
Total	**1620**	**1353**	**38**	**3011**	**78**	**63**	**71**

[a] Excludes Northland and Taranaki DHBs.

[b] Includes unknown sex.

Table 30. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by ethnicity, age group and sex, 2014

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	150	328	478	607	1401	993	104	170	274	493	771	635	55	75	130	353	417	387
Pacific peoples	46	75	121	329	553	440	67	64	131	532	498	515	29	20	49	295	195	244
Asian	3	6	9	-	38	27	27	11	38	109	52	83	31	6	37	125	24	74
MELAA	0	1	1	-	-	-	5	3	8	212	-	186	9	1	10	354	-	203
European or Other	64	96	160	74	118	95	137	76	213	157	89	124	98	51	149	132	67	99
Unknown	55	72	128	-	-	-	111	31	147	-	-	-	97	25	122	-	-	-
Total	**318**	**578**	**897**	**209**	**404**	**304**	**451**	**355**	**811**	**284**	**234**	**261**	**319**	**178**	**497**	**234**	**127**	**179**

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

[b] Excludes Northland and Taranaki DHBs.

[c] Includes unknown sex.

Test positivity and population testing rates

2014 analysis by DHB, age group and sex

Thirty-three laboratories, representing 19 DHBs, tested 439,405 specimens for gonorrhoea, of which 1.0% (4206 specimens from 3038 cases) tested positive, a decrease from the 2013 positive specimen rate (1.1%). The population testing rate was 101 gonorrhoea tests per 1000 population. The specimen counts did not exclude repeat samples from the same individual.

Table 31 presents the number of specimens tested for gonorrhoea, the number of tests per 1000 population, the percentage of specimens that were positive and the number of laboratory confirmed cases, by DHB for 2014.

The highest population testing rates were reported from the Auckland region (114 per 1000 population), Canterbury (113 per 1000) and Lakes (110 per 1000) DHBs. Tairawhiti DHB had the highest percentage of positive specimens (4.0%), followed by Hawke's Bay DHB (1.9%).

Table 32 presents the number of specimens tested for gonorrhoea, the number of tests per 1000 population, the percentage of specimens that were positive and the number of laboratory confirmed cases, by sex and age group for 2014.

The testing rate for males was 40 gonorrhoea tests per 1000 population, and the rate for females was 160 tests per 1000 population. The highest population testing rates were reported in the 20–24 years age group for both males and females (135 per 1000 and 569 per 1000, respectively).

For males the highest percentage of positive specimens was reported in the 15–19 years and Unknown age groups (4.7%) followed by males in the 20–24 years and 25–29 years age groups (both 3.2%). For females the highest percentage of positive specimens was reported in the Unknown, 10–14 years and 15–19 years age groups (4.8%, 2.7% and 1.3%, respectively).

Table 31. 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, 2014

DHB	Total specimens	Tests per 1000 population	Specimens tested positive (%)[a]	Number of laboratory-confirmed cases[b]
Northland[c]	-	-	-	-
Auckland region[d]	175,232	114	1.0	1271
Waikato	38,072	99	1.3	371
Lakes	11,378	110	1.4	132
Bay of Plenty	17,905	82	0.8	123
Tairawhiti	4301	91	4.0	149
Taranaki[e]	11,173	97	0.3	27
Hawke's Bay	14,377	90	1.9	194
Whanganui	4408	71	0.9	36
MidCentral	12,152	71	1.2	132
Wellington region[f]	42,726	97	0.7	225
Wairarapa	2265	53	0.5	10
Nelson Marlborough[g]	11,589	81	0.6	47
West Coast	2100	64	0.1	2
Canterbury	57,906	113	0.7	224
South Canterbury	4029	69	0.5	15
Southern	29,792	96	0.4	80
Total	**439,405**	**101**	**1.0**	**3038**

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

Table 32. 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, 2014

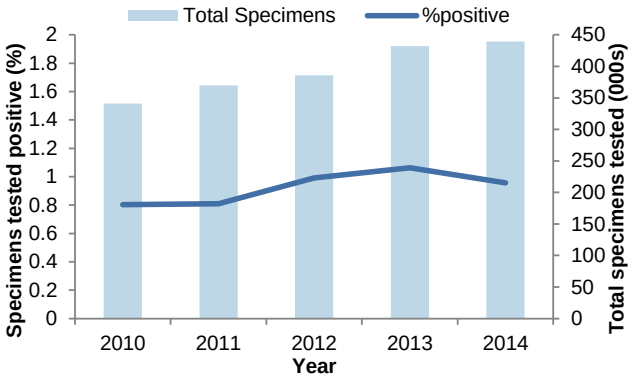
Age group (years)	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[a,b]			Number of laboratory–confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
0–4	876	959	1853	6	7	6	0.5	0.3	0.4	1	2	3
5–9	75	281	357	1	2	1	0.0	0.0	0.0	0	0	0
10–14	420	3094	3523	3	23	13	3.1	2.7	2.8	9	64	73
15–19	9689	52,019	61,775	64	363	209	4.7	1.3	1.8	318	578	897
20–24	21,337	86,490	107,943	135	569	348	3.2	0.5	1.0	451	355	811
25–29	15,665	60,120	75,826	115	428	274	3.2	0.4	0.9	319	178	497
30–34	9837	44,207	54,120	78	323	205	2.8	0.2	0.7	175	82	259
35–39	6513	32,035	38,597	53	237	150	2.2	0.2	0.5	95	38	135
40+	18,868	64,827	83,752	20	63	42	2.0	0.1	0.5	244	48	295
Unknown	192	165	486	-	-	-	4.7	4.8	10.7	8	8	41
Total	**83,472**	**344,197**	**428,232**	**40**	**160**	**101**	**3.0**	**0.5**	**1.0**	**1620**	**1353**	**3011**

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

Trends in test positivity

Between 2010 and 2014, the percentage of positive results recorded for all specimens tested for gonorrhoea, increased slightly from 0.8% to 1.0%. With the addition of DHBs from 2013 there has been a large increase in the number of tests included in this analysis. It is not possible to determine how many of the tests were cultures and how many were NAATs from the previous years' surveillance data (2010–2012). However, 98% (430,679/439,405) of the total number of specimens tested in 2014 recorded this information, of which 13% were cultures and the remainder were NAATs.

Figure 22. Percentage of positive specimens tested and total specimens tested for gonorrhoea, 2010–2014



Note: 2010–2012 data is from 17 DHBs, and 19 DHBs in 2013 and 2014.

Ethnicity analysis of test positivity and population testing rates

Ethnicity information was available for 90.3% (386,828/428,232) of gonorrhoea specimens from 18/20 DHBs. The specimen counts did not exclude repeat samples from the same individual.

Table 33 presents the number of specimens tested for gonorrhoea, the number of tests per 1000 population, the percentage of tested specimens that were positive and the number of laboratory-confirmed cases, by ethnicity and sex for 2014.

For males, the highest population testing rate was reported in the MELAA ethnic group (79 per 1000), followed by Māori and Pacific peoples ethnic groups (42 and 36 per 1000 population, respectively). For females, the highest population testing rate was also reported in the MELAA ethnic group (267 per 1000), followed by Māori and Pacific peoples ethnic groups (249 and 214 per 1000, respectively).

The highest sex-specific percentage of positive tests for gonorrhoea for males was in the Pacific peoples ethnic group (6.2%), followed by the Māori (5.3%) and Unknown (3.7%) ethnic groups. Females had lower positive specimen percentages than males across all ethnic groups, with the highest percentages for females reported in the Māori (1.3%), Unknown (0.8%) and Pacific peoples (0.7%) ethnic groups.

Table 34 to Table 36 present the number of specimens tested for gonorrhoea, the number of tests per 1000 population, the percentage of specimens tested that were positive and the number of laboratory-confirmed cases, by ethnicity and sex for the age groups that reported the highest gonorrhoea rates for 2014 (15–19 years, 20–24 years and 25–29 years age groups).

In the 15–19 years age group, the highest population testing rate for males was reported in the Māori ethnic group (90 per 1000) followed by the Pacific peoples (59 per 1000) and MELAA and European or Other (both 55 per 1000) ethnic groups. For females in the same age group, the pattern was somewhat different with the highest population testing rate reported in the Māori ethnic group (589 per 1000), followed by European or Other (336 per 1000) and then Pacific peoples (286 per 1000) ethnic groups. Males in the Māori and Pacific peoples ethnic groups had the highest percentages of positive specimens (9.0% and 8.3%, respectively) in the 15–19 years age group, and this pattern was also seen for females in this age group with positive specimen rates of 2.8% for Māori and 2.4% for Pacific peoples ethnic groups. Males and females in the Unknown ethnic group followed with 5.7% and 1.6% positive specimens respectively, both of these percentages were higher than the national average for this age group (Table 34).

In the 20–24 years age group, the highest population testing rate for males was reported in the MELAA ethnic group (172 per 1000 population), followed by Māori (134 per 1000), European or Other (133 per 1000) and Pacific peoples (116 per 1000) ethnic groups. In contrast, for females the highest population testing rate was reported in the Māori ethnic group (766 per 1000 population), followed by European or Other (579 per 1000), Pacific peoples (577 per 1000) and then MELAA (563 per 1000) ethnic groups. For males, the Pacific peoples ethnic group had the highest percentage of specimens that were positive (7.6%) followed by Māori (5.3%) and Unknown (3.9%) ethnic groups. For females, the Māori ethnic group had the highest percentage (1.2%), followed by Pacific peoples (1.0%) and Unknown (0.5%) ethnic groups (Table 35).

In the 25–29 years age group, the highest population testing rate for males was reported in the MELAA ethnic group (171 per 1000 population), followed by Māori (116 per 1000) and European or Other (103 per 1000) ethnic groups. In contrast, for females the highest population testing rate was reported in the Māori ethnic group (618 per 1000 population), followed by Pacific peoples (548 per 1000) and MELAA (493 per 1000) ethnic groups. For males, the Pacific peoples ethnic group had the highest percentage of positive specimens (5.7%) followed by Māori (4.9%) and Unknown (3.9%) ethnic groups. For females, the Māori ethnic group had the highest percentage (0.8%) followed by Unknown (0.7%) and Pacific peoples (0.4%) ethnic groups (Table 36).

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 ethnicity and sex, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	10,283	63,820	74,130	42	249	148	5.3	1.3	1.8	374	685	1059
Pacific peoples	4848	29,575	34,431	36	214	126	6.2	0.7	1.5	188	178	366
Asian	5894	36,608	42,516	27	158	94	2.6	0.1	0.5	92	42	134
MELAA	1792	5687	7483	79	267	170	2.9	0.1	0.8	29	6	35
European or Other	44,103	184,089	228,268	33	131	83	1.9	0.2	0.5	507	276	783
Unknown	16,552	24,418	41,404	-	-	-	3.7	0.8	2.1	430	166	634
Total	**83,472**	**344,197**	**428,232**	**40**	**160**	**101**	**3.0**	**0.5**	**1.0**	**1620**	**1353**	**3011**

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

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 ethnicity and sex in the 15–19 years age group, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	2229	13,799	16,037	90	589	333	9.0	2.8	3.6	150	328	478
Pacific peoples	820	3884	4706	59	286	171	8.3	2.4	3.4	46	75	121
Asian	285	1402	1688	16	88	51	1.4	0.4	0.6	3	6	9
MELAA	97	401	498	55	255	150	0.0	0.5	0.4	0	1	1
European or Other	4745	27,416	32,182	55	336	191	2.0	0.5	0.7	64	96	160
Unknown	1513	5117	6664	-	-	-	5.7	1.6	2.5	55	72	128
Total	**9689**	**52,019**	**61,775**	**64**	**363**	**209**	**4.7**	**1.3**	**1.8**	**318**	**578**	**897**

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

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 in the 20–24 years age group, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	2829	16,886	19,720	134	766	457	5.3	1.2	1.8	104	170	274
Pacific peoples	1463	7411	8875	116	577	349	7.6	1.0	2.1	67	64	131
Asian	1193	5335	6531	48	254	143	3.7	0.3	0.9	27	11	38
MELAA	405	1086	1491	172	563	347	2.0	0.4	0.8	5	3	8
European or Other	11,575	49,201	60,804	133	579	353	2.0	0.2	0.5	137	76	213
Unknown	3872	6571	10,522	-	-	-	3.9	0.5	1.8	111	31	147
Total	**21,337**	**86,490**	**107,943**	**135**	**569**	**348**	**3.2**	**0.5**	**1.0**	**451**	**355**	**811**

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

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 25–29 years age group, 2014

Ethnicity	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[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	1803	11,117	12,921	116	618	385	4.9	0.8	1.4	55	75	130
Pacific peoples	846	5612	6458	86	548	322	5.7	0.4	1.1	29	20	49
Asian	1440	7763	9204	58	307	183	3.7	0.1	0.7	31	6	37
MELAA	435	1172	1608	171	493	327	3.7	0.1	1.1	9	1	10
European or Other	7689	29,767	37,459	103	389	248	2.1	0.2	0.6	98	51	149
Unknown	3452	4689	8176	-	-	-	3.9	0.7	2.0	97	25	122
Total	**15,665**	**60,120**	**75,826**	**115**	**428**	**274**	**3.2**	**0.4**	**0.9**	**319**	**178**	**497**

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

Analysis of testing coverage rates (number of people tested annually per 1000 population)

NHI information was available for 93.2% of all gonorrhoea specimens (81.3% of positive specimens) from 18/20 DHBs. The availability of NHI numbers varied by DHB, from 68.8% in Tairawhiti DHB to 99.4% in Hawke's Bay DHB (see Quality of surveillance data). The NHI or patient ID number, where available, was used to remove all repeat tests for an individual in the calendar year, thus allowing reporting of the annual coverage rate (testing rate by person). Table 37 presents the percentage of all tested specimens that were positive, the number of tests per 1000 population and the testing coverage rate by ethnicity and sex for 2014 across the 15–19 years, 20–24 years and 25–29 years age groups.

Annual coverage rates were lower than population testing rates for both males and females across all age groups. For the 15–19 years age group, the male coverage rate was 25% lower and the female coverage rate 37% lower, than the respective population testing rates. For the 20–24 years age group the male coverage rate was 31% lower and the female coverage rate 33% lower, than the respective poulation testing rates. For the 25–29 years age group the male coverage rate was 34% lower and the female coverage rate 29% lower, than the respective population testing rates. Annual coverage rates for these three high risk age groups were between 48 and 93 per 1000 population (<10%) for males and between 231 and 384 per 1000 (23–38%) for females.

Different ethnic groups showed variation in the percentage decrease between population testing rates and coverage rates. For males, the Asian and MELAA ethnic groups showed the greatest percentage change, especially in the 20–24 years (decreases of 40% and 35%, respectively) and 25–29 years (decreases of 46% and 42%, respectively) age groups. The pattern was different for females with Māori and Pacific peoples ethnic groups showing the most percentage decrease across all age groups but with the greatest change in the 15–19 years age group (decreases of 42% for both ethnicities).

Table 37. Percentage of gonorrhoea specimens tested that were positive, number of tests per 1000 population, and number of people tested per 1000 population by ethnicity, age group and sex, 2014

Ethnicity	Age group (years)[a]																	
	15–19						20–24						25–29					
	Specimens tested positive (%)[b]		Total tests per 1000 population		People tested per 1000 population[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		People tested per 1000 population[c]		Specimens tested positive (%)[b]		Total tests per 1000 population		People tested per 1000 population[c]	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Māori	9.0	2.8	90	589	69	343	5.3	1.2	134	766	95	476	4.9	0.8	116	618	77	397
Pacific peoples	8.3	2.4	59	286	44	166	7.6	1.0	116	577	80	354	5.7	0.4	86	548	59	358
Asian	1.4	0.4	16	88	11	59	3.7	0.3	48	254	29	181	3.7	0.1	58	307	31	228
MELAA	0.0	0.5	55	255	45	171	2.0	0.4	172	563	111	371	3.7	0.1	171	493	100	348
European or Other	2.0	0.5	55	336	41	216	2.0	0.2	133	579	92	396	2.1	0.2	103	389	69	279
Unknown	5.7	1.6	-	-	-	-	3.9	0.5	-	-	-	-	3.9	0.7	-	-	-	-
Total	**4.7**	**1.3**	**64**	**363**	**48**	**231**	**3.2**	**0.5**	**135**	**569**	**93**	**384**	**3.2**	**0.4**	**115**	**428**	**76**	**303**

[a] All percentages and rates exclude Northland and Taranaki DHBs.

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

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

Specimen site

2014 analysis

The site from which a specimen was taken was recorded for 98.9% (4101/4145) of positive specimens, based on data from 38 laboratories (see Analytical methods). In males, the most common specimen site was urine (38.9%, 967/2484 positive specimens). In females, the most common specimen site was the vagina (43.9%, 733/1670 positive specimens). The proportion of positive sites that were not urogenital was much lower in females than in males (6.2%, 103/1670 for females, and 29.3%, 727/2484 for males) (Table 38).

Table 38. Percentage of positive gonorrhoea tests by specimen site and sex, 2014

Specimen site[a]	Sex	
	Male	Female
Urethral	28.0	0.3
Vaginal	-	43.9
Cervix	-	39.9
Penile	2.8	-
Anorectal	11.2	0.5
Eye	0.2	0.0
Urine	38.9	8.3
Urogenital[b]	0.0	0.2
Throat	16.8	2.2
Other	1.0	3.5

[a] Includes data from 38 laboratories.

[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 from 2010 to 2014 for females and males (see Analytical methods). Over this period, in males, there was a decrease in the proportion of positive tests from urethral specimens and a notable increase in the proportion of positive anorectal, throat and urinary specimens. In females, there was an increase in the proportion of positive vaginal and throat specimens. The proportion of positive cervical specimens increased from 2010 to 2013 but then decreased in 2014.

Figure 23. Specimen site, as a percentage of all positive gonorrhoea tests in males, 2010–2014

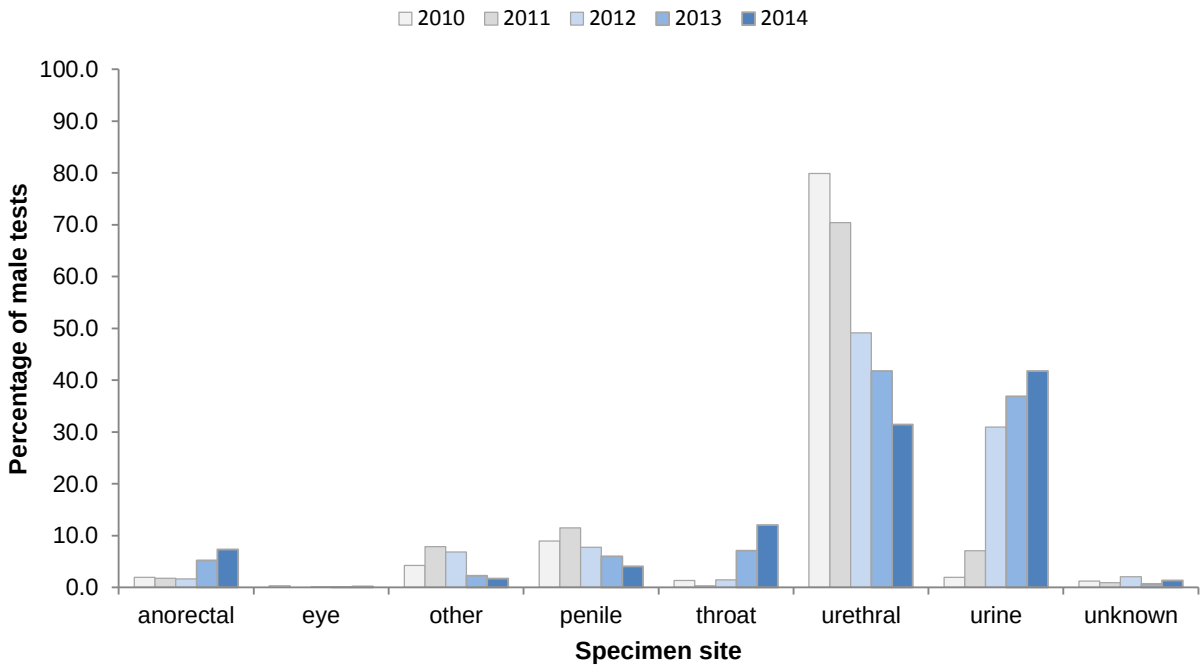
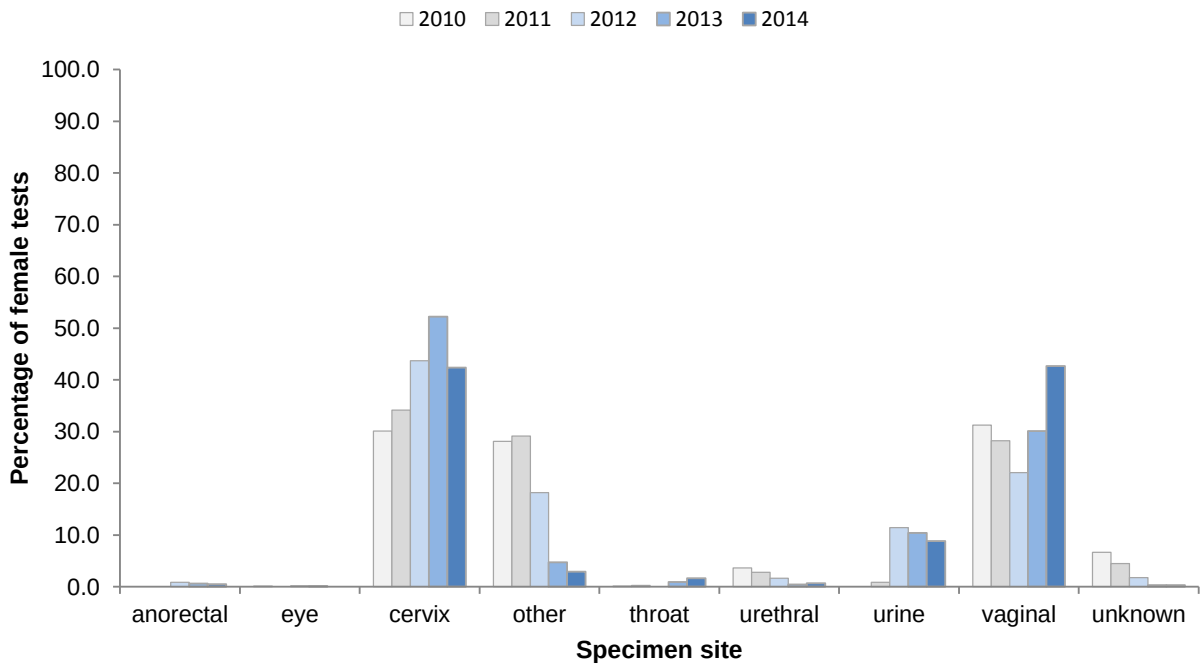


Figure 24. Specimen site, as a percentage of all positive gonorrhoea tests in females, 2010–2014



Antibiotic resistance surveillance

In 2014, the prevalence of resistance to penicillin and ciprofloxacin among *N. gonorrhoeae* isolates was 9.6% and 36.1% respectively. The rate of penicillin resistance has increased since 2013, while ciprofloxacin resistance has remained stable. The number of isolates tested has decreased compared with 2013, (for penicillin resistance from 422 to 208 and for ciprofloxacin resistance from 1055 to 667).

In 2014, penicillin resistance ranged from 100.0% (1 isolate tested) in Bay of Plenty DHB to 0.0% in Nelson Marlborough and West Coast DHBs. Ciprofloxacin resistance ranged from 100.0% (1 isolate tested) in Wairarapa DHB to 0.0% in West Coast and South Canterbury DHBs. Data was only provided from some of the laboratories for Northland and Taranaki DHBs (Table 39). The prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates from 2000 to 2014 is illustrated in Figure 25.

Ceftriaxone is now considered the first-line treatment for gonorrhoea. While no ceftriaxone resistance (minimum inhibitory concentration (MIC) >0.25 mg/L) has been detected among *N. gonorrhoeae* in New Zealand to date, in 2014 an isolate with decreased susceptibility to ceftriaxone (MICs typically 0.06 mg/L) was identified in Canterbury DHB. Isolates with decreased susceptibility had previously been identified in the Auckland region and in Waikato DHB.

Figure 25. Prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates, 2000–2014

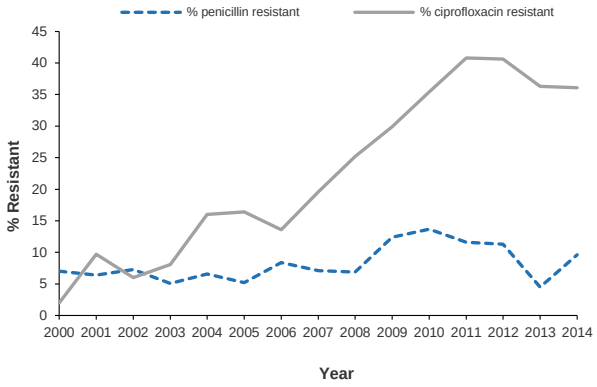


Table 39. Penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates by DHB, 2014

DHB	Penicillin		Ciprofloxacin	
	Number tested	% resistant	Number tested	% resistant
Northland	-	-	-	-
Auckland region[b]	-	-	289	36.0
Waikato	48	8.3	83	22.9
Lakes	13	15.4	15	73.3
Bay of Plenty	1	100.0	11	45.5
Tairawhiti	-	-	16	31.3
Taranaki	-	-	-	-
Hawke's Bay	66	6.1	66	24.2
MidCentral/Whanganui	-	-	20	55.0
Wairarapa	-	-	1	100.0
Wellington region[c]	-	-	20	40.0
Nelson Marlborough	11	0.0	11	45.5
West Coast	1	0.0	1	0.0
Canterbury	57	10.5	108	39.8
South Canterbury	-	-	7	0.0
Southern	11	9.1	19	36.8
Total[a]	**208**	**9.6**	**667**	**36.1**

[a] Data incomplete for Northland and Taranaki DHBs.
[b] Waitemata, Auckland and Counties Manukau DHBs.
[c] Hutt Valley and Capital & Coast DHBs.

Clinic surveillance of gonorrhoea

National analysis

2014 analysis

In 2014, the number of gonorrhoea cases reported by SHCs and FPCs were 794 and 253 respectively (Table 40).

Table 40. Gonorrhoea case numbers by clinic type, 2014

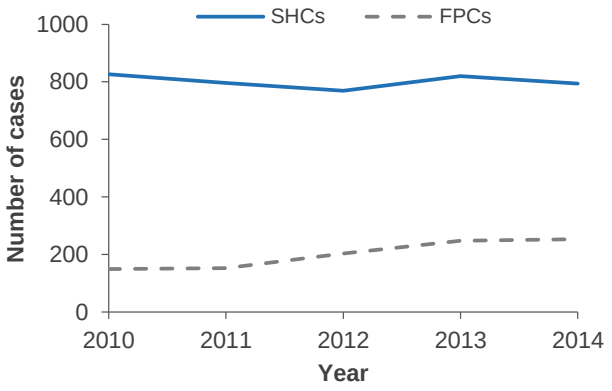
Clinic type	Total number of cases
SHC	794
FPC	253
Total	**1047**

Trends in national totals

Between 2013 and 2014, gonorrhoea case numbers reported by SHCs decreased by 3.2% (from 820 to 794 cases) and FPCs increased by 2.4% (from 247 to 253 cases).

From 2010 to 2014, gonorrhoea case numbers reported by SHCs decreased by 3.9% (from 826 to 794 cases) and FPCs increased by 69.8% (from 149 to 253 cases).

Figure 26. Gonorrhoea case numbers by clinic type, 2010–2014



DHB counts

2014 analysis

Clinics in 19 DHBs contributed to gonorrhoea surveillance in 2014. Gonorrhoea case numbers in each DHB by clinic type are presented in Table 41. The highest number of gonorrhoea cases in SHCs was seen in the Auckland region (281 cases) and in Waikato DHB (121 cases). In DHBs with both SHCs and FPCs, higher case counts were seen in SHCs, except in Tairawhiti, Nelson Marlborough and West Coast DHBs.

Table 41. Gonorrhoea case numbers by clinic type and DHB, 2014

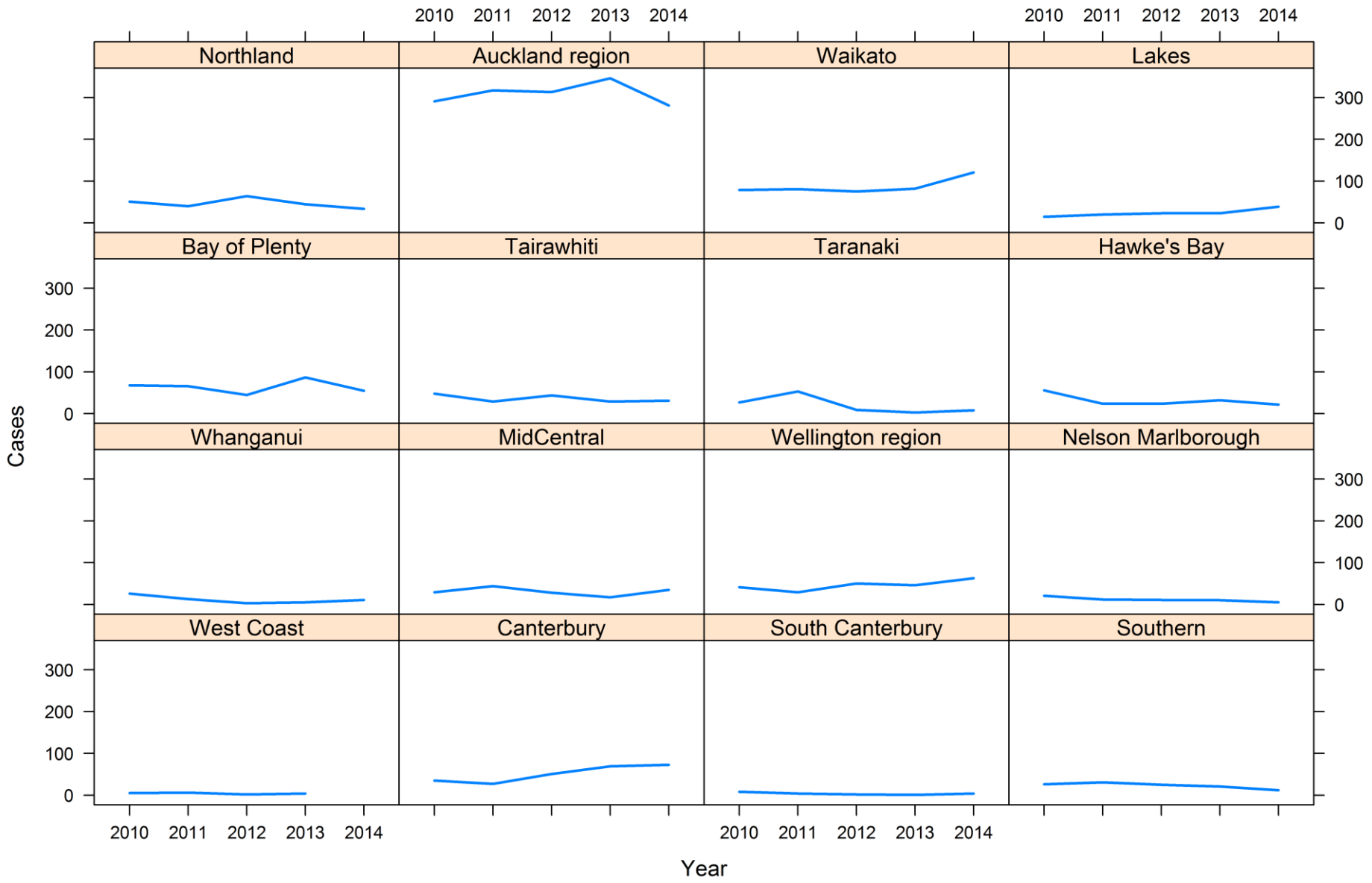
DHB	Clinic type		Total
	SHC	FPC	
Northland	34	8	42
Auckland region[a]	281	63	344
Waikato	121	66	187
Lakes	39	0	39
Bay of Plenty	55	3	58
Tairawhiti	31	41	72
Taranaki	8	2	10
Hawke's Bay	22	0	22
Whanganui	11	6	17
MidCentral	35	0	35
Wellington region[b]	63	22	85
Nelson Marlborough	5	13	18
West Coast	0	1	1
Canterbury	73	20	93
South Canterbury	4	1	5
Southern	12	7	19

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

Trends in DHB counts

Gonorrhoea case numbers in SHCs from 2010 to 2014 are presented by DHB in Figure 27. There are variations in the trends seen in DHBs. For example, case numbers increased over the five-year period in Canterbury, Lakes and Waikato DHBs and the Wellington region, but case numbers decreased in Hawke's Bay and Nelson Marlborough DHBs.

Figure 27. Gonorrhoea case numbers in SHCs by DHB, 2010–2014



Sex, age and ethnicity distribution of gonorrhoea cases

2014 analysis

Sex was recorded for all but two gonorrhoea cases. More cases of gonorrhoea were reported in both males and females in SHCs than in FPCs. The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2014, the male to female ratio of attendees at FPCs was 1:23). Table 42 presents the number of cases of gonorrhoea by sex and clinic type for 2014.

Table 42. Gonorrhoea case by sex and clinic type, 2014

Sex	Clinic type	
	SHC	FPC
Male	514	63
Female	279	189
Total[a]	**794**	**253**

[a] Includes unknown sex.

Age was recorded for all gonorrhoea cases in 2014. A large proportion of the reported cases of gonorrhoea were aged less than 25 years - 45.7% (363/794) in SHCs and 90.1% (228/253) in FPCs. The mean age of gonorrhoea cases was 28.0 years in SHCs and 19.7 years in FPCs.

The number of males with gonorrhoea was highest in the 25–29 years age group in SHCs (125 cases), while in FPCs the number of males with gonorrhoea was highest in the 15–19 years age group (34 cases). The number of females with gonorrhoea was highest in the 15–19 years age group across both clinic types - 105 cases (37.6%) in SHCs and 112 cases in FPCs (59.3%).

Figure 28 and Figure 29 present the number of confirmed cases of gonorrhoea by age group and sex for 2014 in SHCs and FPCs.

Figure 28. Gonorrhoea case numbers reported by SHCs by age group and sex, 2014

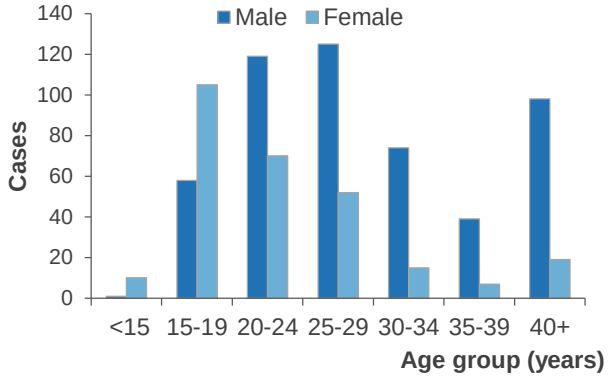
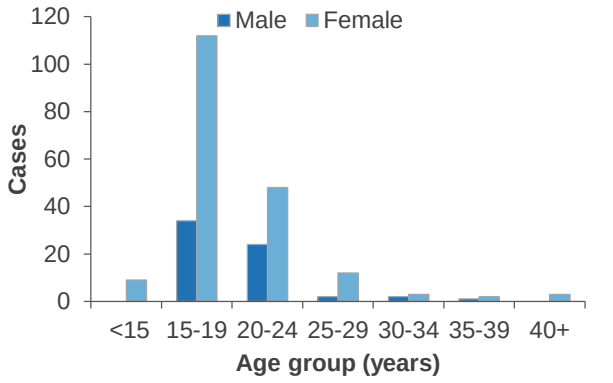


Figure 29. Gonorrhoea case numbers reported by FPCs by age group and sex, 2014



Ethnicity was recorded by SHCs for 98.0% (778/794) of the reported cases of gonorrhoea. The highest percentage of gonorrhoea cases reported by SHCs were of European ethnicity (41.1%, 320 cases), followed by Māori (40.5%, 315 cases), Other ethnicity (10.8%, 84 cases) and Pacific peoples (7.6%, 59 cases) (Table 43). Ethnicity was recorded by FPCs for 98.8% (250/253) of the reported cases. The highest percentage of gonorrhoea cases reported by FPCs were of Māori ethnicity (57.2%, 143 cases), followed by European (28.8%, 72 cases), Pacific peoples (12.4%, 31 cases) and Other ethnicity (1.6%, 4 cases).

Table 43. Gonorrhoea cases by ethnicity and clinic setting, 2014

Ethnicity	Clinic type	
	SHC	FPC
European	320	72
Māori	315	143
Pacific peoples	59	31
Other	84	4
Unknown	16	3
Total	**794**	**253**

Trends in sex, age and ethnicity

Between 2010 and 2014, the numbers of cases of gonorrhoea in females reported by SHCs were highest in the 15–19 years and 20–24 years age groups. Over this time period, case numbers in males had previously been highest in the 20–24 years age group, but in 2014, they were highest in the 25–29 years age group (Figure 30).

FPCs predominantly diagnosed gonorrhoea in females in the 15–19 years and 20–24 years age groups. Since 2010, a substantial increase has been seen in the number of female cases in the 15–19 years age group (from 59 to 112 cases). Male case numbers were consistently low across all age group in FPCs between 2010 and 2014, with an increase seen in the 15–19 years age group from 2010 and in the 20–24 years age group in 2014 (Figure 31).

Figure 30. Gonorrhoea cases in SHCs by sex and age group, 2010–2014

Figure 31. Gonorrhoea cases in FPCs by sex and age group, 2010–2014

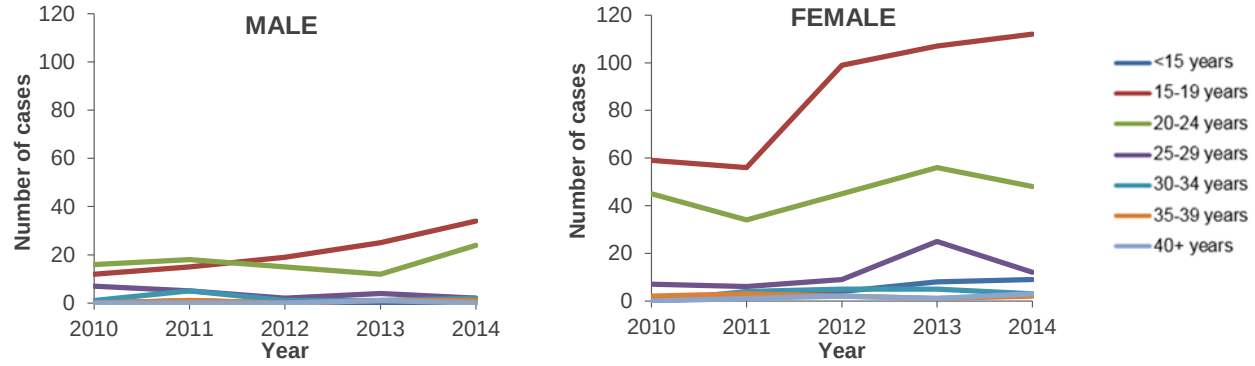


Figure 32 and Figure 33 present the number of cases of gonorrhoea reported from SHCs and FPCs by ethnicity between 2010 and 2014. In SHCs, there was an increase in the number of gonorrhoea cases seen in the Other (34 to 84 cases) ethnic group, and a decrease in cases in the Pacific peoples (102 to 59 cases) and Māori (374 to 315 cases) ethnic groups between 2010 and 2014. In FPCs, there was an increase in the number of cases seen in the Māori (76 to 143 cases), Pacific peoples (13 to 31 cases) and European (52 to 72 cases) ethnic groups.

Figure 32. Gonorrhoea cases reported from SHCs by ethnicity, 2010–2014

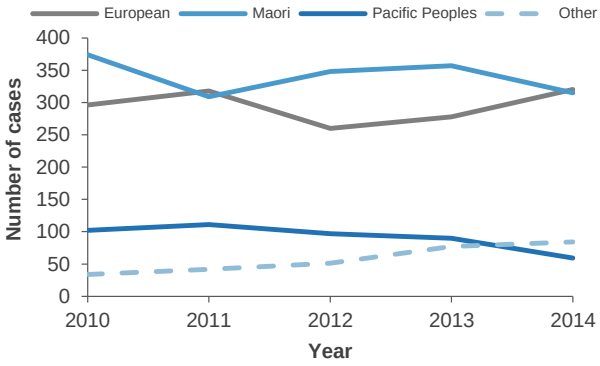
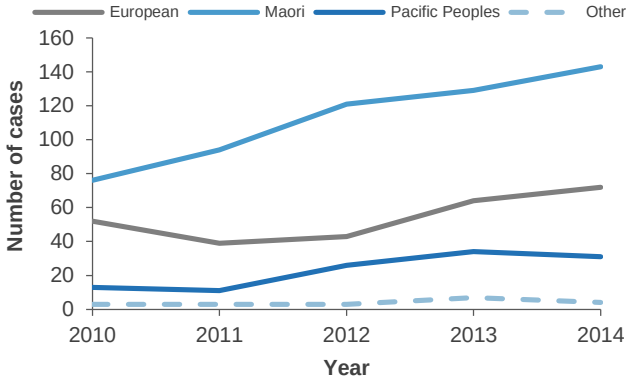


Figure 33. Gonorrhoea cases reported from FPCs by ethnicity, 2010–2014



Site of infection

2014 analysis

In 2014, gonorrhoea cases were most commonly confirmed from a urogenital site in both types of clinic as follows: 77.2% of SHC cases (613 cases) and 90.5% of FPC cases (229 cases) (Table 44).

In SHCs, the next most common sites was the pharynx with 15.9% (126 cases), followed by anorectal at 15.5% (123 cases).

Table 44. Gonorrhoea cases by site of infection and clinic setting, 2014

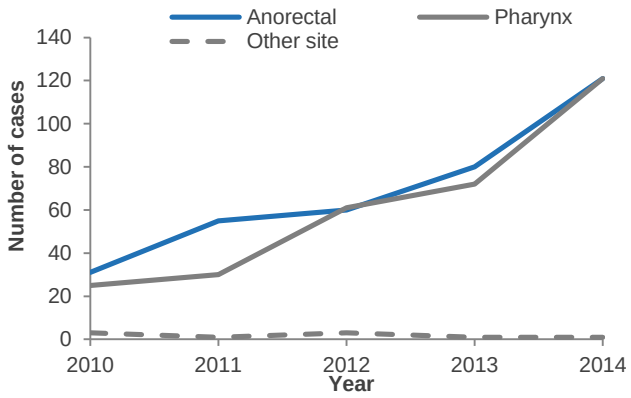
Site	Clinic type	
	SHC	FPC
Urogenital	613	229
Anorectal	123	4
Pelvic inflammatory disease/epididymitis	4	16
Pharynx	126	5
Other site	2	2
Total[a]	**794**	**253**

[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

Figure 34 presents the trends in non-complicated non-urogenital gonorrhoea sites reported in males by SHCs between 2010 and 2014. Increases in anorectal and pharyngeal gonorrhoea infections were reported over the time period (from 31 to 121 cases and from 25 to 121 cases, respectively). Gonorrhoea infections at other sites have remained low. In females, the number of non-complicated non-urogenital gonorrhoea infections were very low between 2010 and 2014, hence trend analysis is not presented.

Figure 34. Site of infection, non-complicated non-urogenital gonorrhoea cases in males in SHCs, 2010–2014



Complicated infections

2014 analysis

Complicated infections (epididymitis in males and pelvic inflammatory disease (PID) in females) were reported for 0.5% (4/794) of gonorrhoea cases in SHCs and 6.3% (16/253) of cases in FPCs. Two males (both in FPCs) were reported with epididymitis. Both cases were aged less than 25 years and were of Pacific peoples ethnicity. A total of 18 females (4 in SHCs and 14 in FPCs) were reported with PID, of whom 83.3% (15 cases) were aged less than 25 years. Ethnicity was recorded for all female PID cases: 9 cases (50.0%) were of Māori ethnicity, 8 cases (44.4%) were of European ethnicity, and 1 case (5.6%) was of Pacific peoples ethnicity.

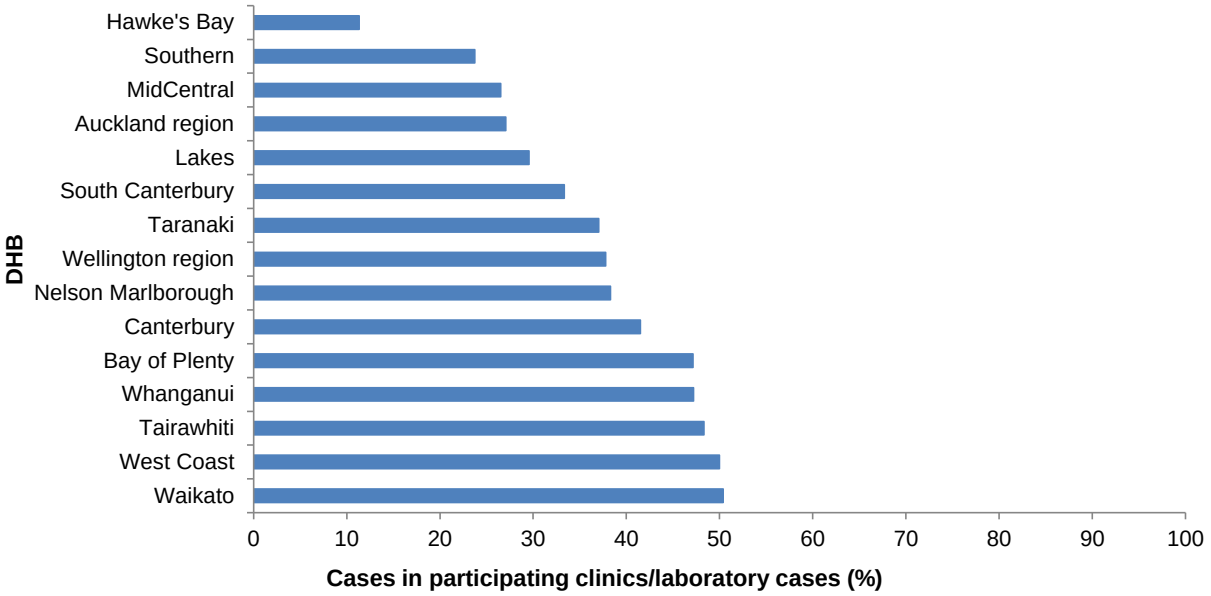
Trends in complicated infections

Case numbers of complicated gonorrhoea infections reported by SHCs were very low for both males and females between 2010 and 2014, hence trend analysis is not presented.

Comparison of laboratory and clinic surveillance

Clinic cases as a proportion of laboratory cases are presented in Figure 35 for DHBs that met the selection criteria for gonorrhoea laboratory reporting (see Analytical methods) and have clinics that participate in the STI surveillance programme. Gonorrhoea cases that are not seen in the participating clinics are likely to be diagnosed in a primary care setting. The highest proportion of gonorrhoea cases reported by a participating clinic was in the Waikato DHB (50.4%), followed by West Coast (50.0%) and Tairawhiti (48.3%) DHBs. The lowest proportion of gonorrhoea cases reported by participating clinics were in Hawke's Bay (11.3%) and Southern (23.8%) DHBs.

Figure 35. Cases of gonorrhoea seen in participating clinics as a proportion (%) of all positive laboratory tests by DHB, 2014



GENITAL HERPES

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GENITAL HERPES (FIRST PRESENTATION)

Key findings

- In 2014, 1155 first presentations of genital herpes were reported; 834 cases were seen in SHCs and 321 cases in FPCs.
- Since 2010 a marked decrease has occurred in case numbers reported by SHCs in females aged 15–19 years.

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 [16]. 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 [17].

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 [13]. The ulcerative lesions of HSV facilitate the transmission of HIV infection [18].

Clinic surveillance of genital herpes (first presentation)

National analysis

2014 analysis

In 2014, the number of genital herpes (first presentation) cases reported by SHCs and FPCs were 834 and 321 cases respectively (Table 45).

Table 45. Genital herpes (first presentation) case numbers by clinic type, 2014

Clinic type	Total number of cases
SHC	834
FPC	321
Total	**1155**

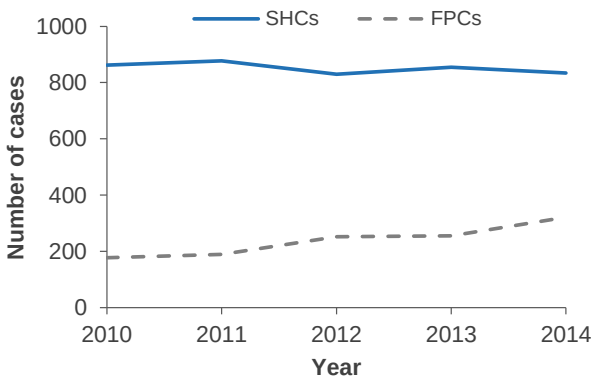
Trends in national totals

Between 2013 and 2014, genital herpes clinic case counts reported by SHCs decreased by 2.5% (from 855 to 834 cases), whereas case counts reported by FPCs increased by 25.9% (from 255 to 321 cases).

From 2010 to 2014, genital herpes clinic case counts reported by SHCs decreased by 3.2% (from 862 to 834 cases). By contrast, genital herpes clinic case counts increased by 81.4% in FPCs (from 177 to 321 cases) (Figure 36).

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.

Figure 36. Genital herpes (first presentation) cases by clinic type, 2010–2014



DHB counts

2014 analysis

Clinics in 19 DHBs contributed to genital herpes surveillance in 2014. The numbers of genital herpes cases in each clinic type by DHB are presented in Table 46. The highest case numbers of genital herpes in SHCs and FPCs were seen in the Auckland region (189 and 55 cases, respectively) and in Canterbury DHB (128 and 84 cases, respectively). In DHBs with both SHCs and FPCs, higher genital herpes case counts were seen in SHCs.

Table 46. Genital herpes (first presentation) case numbers by clinic type and DHB, 2014

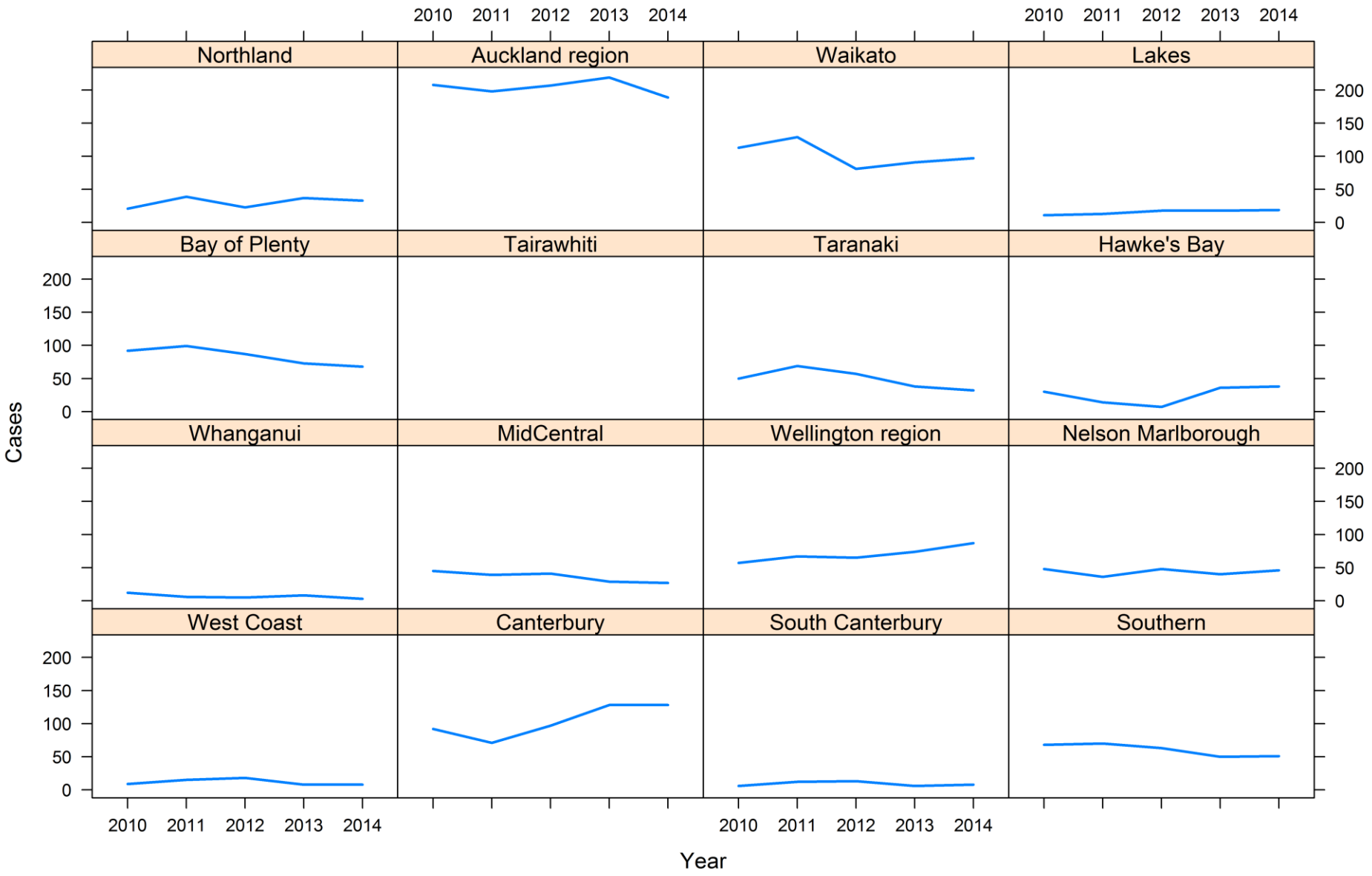
DHB	Clinic type		Total
	SHC	FPC	
Northland	33	6	39
Auckland region[a]	189	55	244
Waikato	97	20	117
Lakes	19	0	19
Bay of Plenty	68	5	73
Tairawhiti	-	4	4
Taranaki	32	2	34
Hawke's Bay	38	0	38
Whanganui	3	5	8
MidCentral	27	0	27
Wellington region[b]	87	58	145
Nelson Marlborough	46	44	90
West Coast	8	0	8
Canterbury	128	84	212
South Canterbury	8	2	10
Southern	51	36	87

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

Trends in DHB counts

The number of genital herpes cases seen in SHCs from 2010 to 2014 is presented by DHB in Figure 37. Variations are seen among DHBs. For example, there are increasing case numbers over the five-year period in the Wellington region and Canterbury DHBs, while decreasing case numbers were seen in Waikato, Bay of Plenty, Taranaki, Whanganui, MidCentral and Southern DHBs.

Figure 37. Genital herpes case numbers in SHCs by DHB, 2010–2014



*Data was not available for Tairawhiti DHB for 2009–2014.

Sex, age and ethnicity distribution of genital herpes

2014 analysis

Sex was recorded for all but three cases of genital herpes. More cases of genital herpes were seen in females than males at SHCs (54.4%, 453/833 cases) and at FPCs (85.6%, 273/319) (Table 47). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2014, the male to female ratio of attendees at FPCs was 1:23).

Table 47. Genital herpes (first presentation) cases by sex and clinic type, 2014

Sex	Clinic type	
	SHC	FPC
Male	380	46
Female	453	273
Total[a]	**834**	**321**

[a] Includes Unknown sex.

Age was recorded for all cases of genital herpes except one. In SHCs, 37.2% (310/833) of the reported cases of genital herpes were aged less than 25 years. This proportion was larger in FPCs (65.1%, 209/321). The mean age of genital herpes cases was 31.0 years in SHCs and 24.5 years in FPCs.

Across both clinic types, the number of females with genital herpes was highest in the 20–24 years age group (131 cases in SHCs and 93 cases in FPCs). The number of males with genital herpes was highest in the 25–29 years age group in SHCs (89 cases) and in the 20–24 years age group in FPCs (16 cases). Figure 38 and Figure 39 present the number of genital herpes cases reported by age group and sex for SHCs and FPCs in 2014.

Figure 38. Number of cases of genital herpes reported by SHCs by age group and sex, 2014

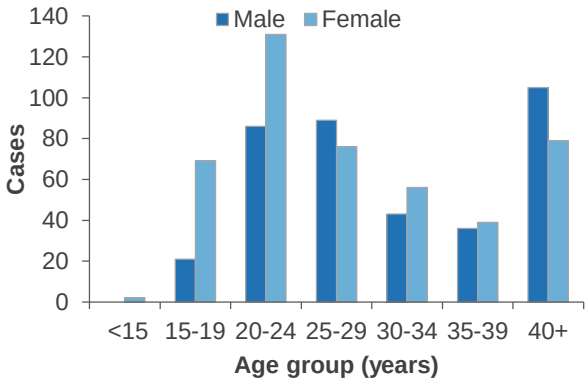
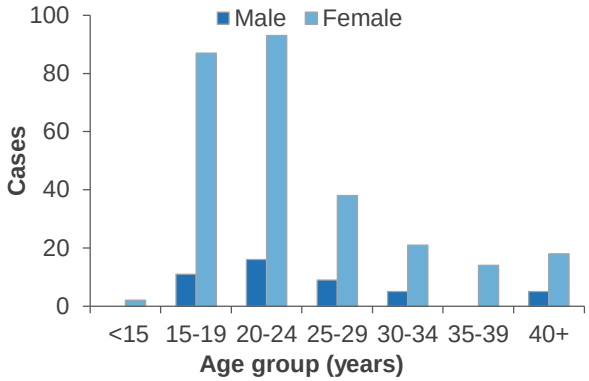


Figure 39. Number of cases of genital herpes reported by FPCs by age group and sex, 2014



Ethnicity was recorded by SHCs for 97.6% (814/834) of the reported cases of genital herpes (Table 48). The highest percentage of cases recorded by SHCs were of European ethnicity (70.3%, 572 cases), followed by Māori (15.1%, 123 cases), Other (12.0%, 98 cases) and Pacific peoples (2.6%, 21 cases) ethnicity. Ethnicity was recorded by FPCs for 95.6% (307/321) of the reported cases of genital herpes. The highest percentage of cases recorded by FPCs were of European ethnicity (78.2%, 240 cases), followed by Māori (13.7%, 42 cases), Other (5.5%, 17 cases) and Pacific peoples (2.6%, 8 cases) ethnicity.

Table 48. Genital herpes (first presentation) cases by ethnicity and clinic type, 2014

Ethnicity	Clinic type	
	SHC	FPC
European	572	240
Māori	123	42
Pacific peoples	21	8
Other	98	17
Unknown	20	14
Total	**834**	**321**

Trends in sex, age and ethnicity

Between 2010 and 2014, the highest number of genital herpes cases in SHCs was seen in females in the 20–24 years age group (

Figure 40). In males, it was also consistently high in this group over the same time period. A slightly decreasing or stable trend in case numbers was observed in the younger age groups in females over the five year period, except for a large increase in case numbers in the 25–29 years age group in 2013. This contrasted with an increasing trend since 2012 for females aged 30 years and over. Since 2010

a marked decrease has occurred in case numbers reported by SHCs in females aged 15–19 years. By contrast, a decreasing or stable trend in case numbers was observed in males in most age groups, except for an increase in cases reported in the 25–29 years and 40 years and over age groups in 2014.

In FPCs, the highest numbers of genital herpes cases were in females in the 15–19 years and 20–24 years age groups (Figure 41). Case numbers were low in males but showed an increasing trend in 25–29 years, 30–34 years and the over 40 years age groups over the five-year period. For females, there was a large increase in the 15–19 years, 20–24 years, 25–29 years and 30–34 years age groups, and a slightly increasing or stable trend in case numbers was observed in the other age groups.

Figure 40. Genital herpes (first presentation) cases in SHCs by sex and age group, 2010–2014

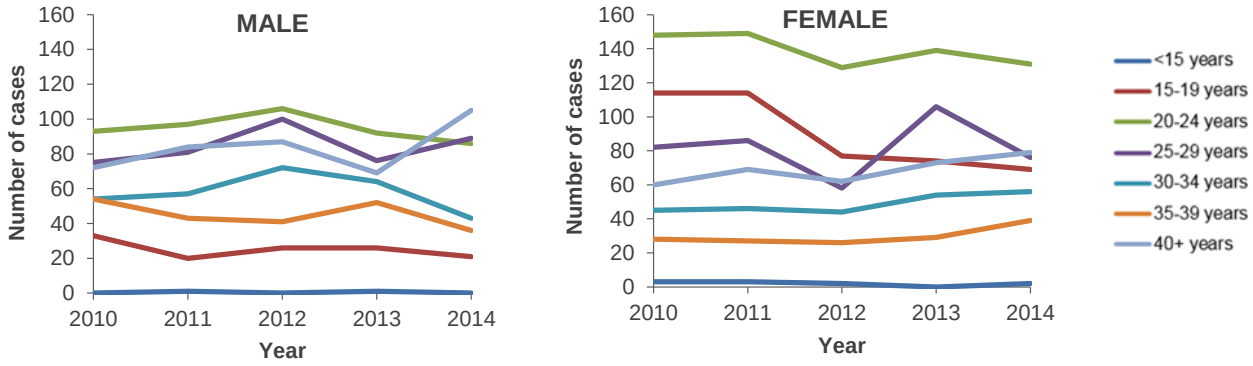


Figure 41. Genital herpes (first presentation) cases in FPCs by sex and age group, 2010–2014

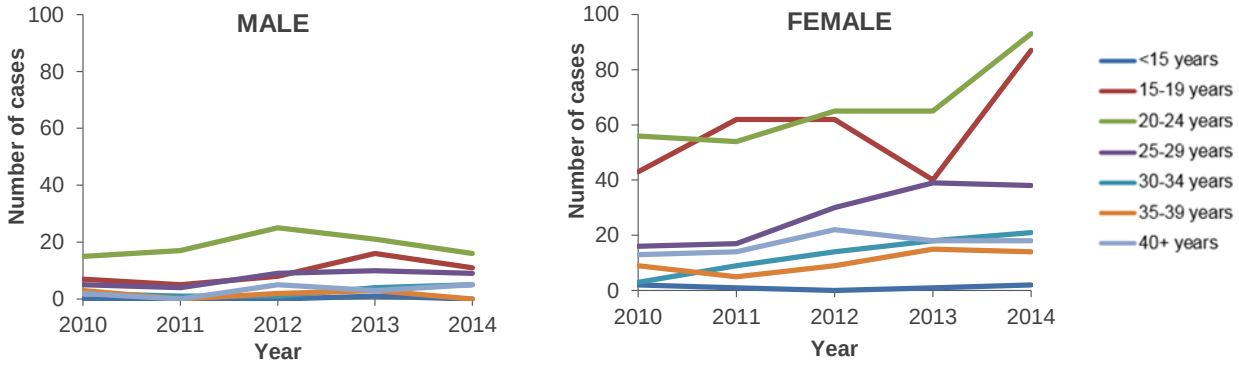


Figure 42 and Figure 43 show the number of first presentations of genital herpes reported from SHCs and FPCs by ethnicity between 2010 and 2014. Cases of genital herpes were substantially more common in those of European ethnicity in both clinic settings over the five-year period.

In SHCs, case numbers remained stable in most ethnic groups, but with a relatively large increase (42% from 69 to 98 cases) in the Other ethnicity group. In FPCs, case numbers increased notably in all ethnic groups.

Figure 42. Number of genital herpes (first presentation) cases reported from SHCs by ethnicity, 2010–2014

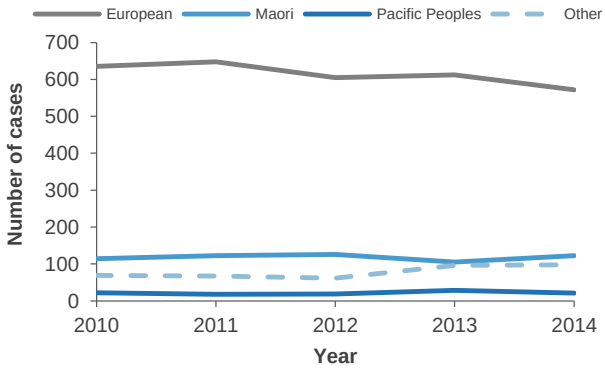
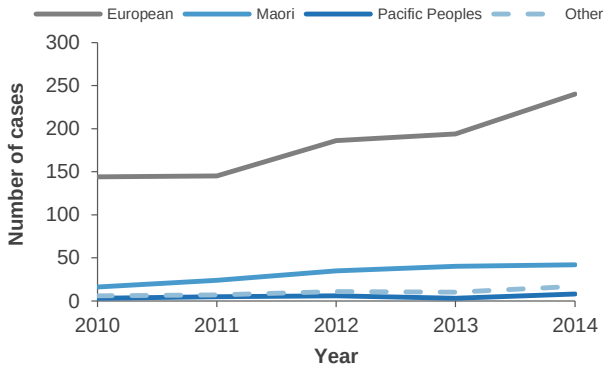


Figure 43. Number of genital herpes (first presentation) cases reported from FPCs by ethnicity, 2010–2014



GENITAL WARTS

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GENITAL WARTS (FIRST PRESENTATION)

Key findings

- 2003 first presentations of genital warts were reported in 2014. Of these, 1777 were seen in SHCs.
- Case numbers decreased in SHCs and FPCs between 2013 and 2014.
- Since 2010 a marked decrease has occurred in case numbers reported in females aged 15–19 years and 20–24 years age groups.

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 [19]. 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 and is still available free for girls and young women until their 20th birthday [20]. Immunisation coverage varies by birth cohort with 48% of women born in 1991 estimated to have received three doses of quadrivalent HPV vaccine compared with 54% of girls born in 2000 as of 28 February, 2014 [21].

Clinic surveillance of genital warts (first presentation)

National analysis

2014 analysis

In 2014, genital warts was the most commonly reported viral STI in New Zealand. The number of genital warts (first presentation) reported by SHCs and FPCs were 1777 and 226 cases respectively (Table 49).

Table 49. Genital warts (first presentation) case numbers by clinic type, 2014

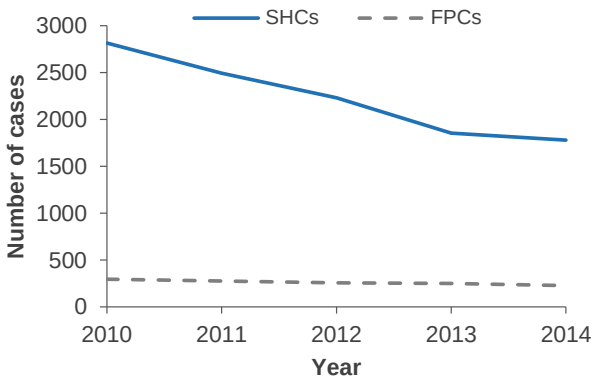
Clinic type	Total number of cases
SHC	1777
FPC	226
Total	**2003**

Trends in national totals

Between 2013 and 2014, genital warts clinic case counts reported by SHCs decreased by 4.2% (from 1854 to 1777 cases) and case counts reported by FPCs decreased by 8.9% (from 248 to 226 cases).

From 2010 to 2014, genital warts clinic case counts reported by SHCs decreased by 36.8% (from 2813 to 1777 cases) and case counts reported by FPCs by 23.1% (from 294 to 226 cases) (Figure 44).

Figure 44. Genital warts (first presentation) cases by clinic type, 2010–2014



DHB counts

2014 analysis

Clinics in 19 DHBs contributed to genital warts surveillance in 2014. The numbers of genital warts cases in each clinic type by DHB are presented in Table 50. The highest numbers of genital warts in SHCs were seen in the Auckland and Wellington regions (635 cases and 195 cases, respectively), and Waikato and Canterbury DHBs (175 and 174 cases, respectively). In DHBs with both SHCs and FPCs, higher genital warts case counts were seen in SHCs, except for in Whanganui which had equal case counts in both clinic types.

Table 50. Genital warts (first presentation) case numbers by clinic type and DHB, 2014

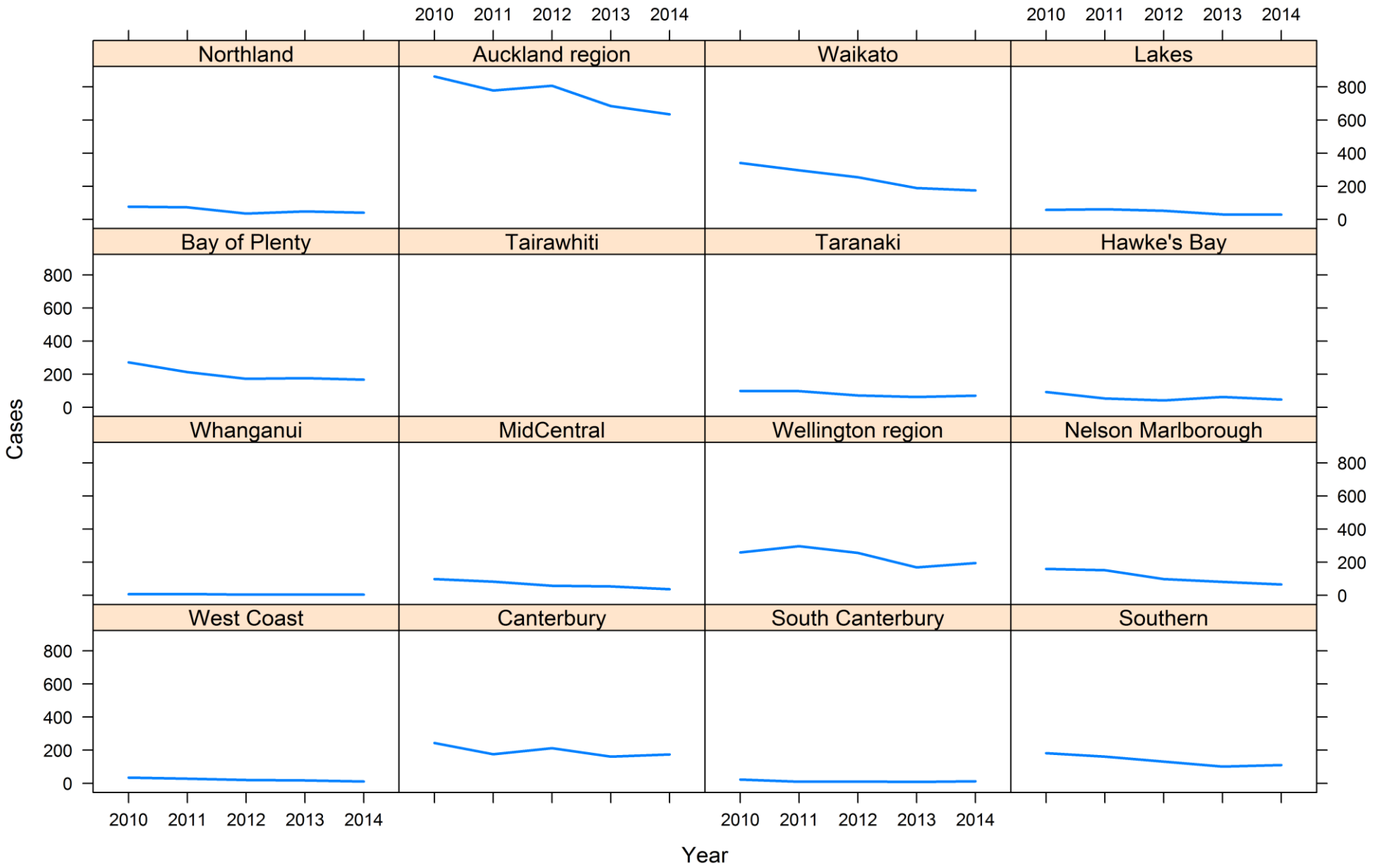
DHB	Clinic type		Total
	SHC	FPC	
Northland	41	10	51
Auckland region[a]	635	58	693
Waikato	175	23	198
Lakes	29	0	29
Bay of Plenty	168	4	172
Tairawhiti	0	9	9
Taranaki	71	1	72
Hawke's Bay	48	0	48
Whanganui	5	5	10
MidCentral	37	0	37
Wellington region[b]	195	38	233
Nelson Marlborough	66	8	74
West Coast	11	1	12
Canterbury	174	38	212
South Canterbury	12	1	13
Southern	110	30	140

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

Trends in DHB counts

Genital warts case numbers in SHCs from 2010 to 2014 are presented by DHB in Figure 45. SHCs in all DHBs have reported a decrease in the number of cases over the five-year period.

Figure 45. Genital warts case numbers in SHCs by DHB, 2010–2014



*Data was not available for Tairawhiti DHB for 2009–2014.

Sex, age and ethnicity distribution of genital warts

2014 analysis

Sex was recorded for all but four genital warts cases. More cases of genital warts were seen in males than females at SHCs (61.2%, 1081/1776). By contrast, more cases of genital warts were seen in females than males at FPCs (70.0%, 156/223) (Table 51). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2014, the male to female ratio of attendees at FPCs was 1:23).

Table 51. Genital warts (first presentation) cases by sex and clinic type, 2014

Sex	Clinic type	
	SHC	FPC
Male	1081	67
Female	695	156
Total[a]	**1777**	**226**

[a] Includes unknown sex.

Age was recorded for all genital warts cases except one. In SHCs, 39.0% (693/1776) of the reported cases of genital warts were aged less than 25 years. The proportion of cases aged less than 25 years was larger in FPCs (62.4%, 141/226) than in SHCs. The mean age of cases of genital warts was 29.5 years in SHCs and 24.2 years in FPCs.

In SHCs, the number of cases in both males and females with genital warts was highest in the 20–24 years age group (325 and 217 cases respectively). In FPCs, the highest numbers of cases in males and females were also seen in this age group (34 and 49 cases, respectively). Figure 46 and Figure 47 present the number of genital warts cases reported by age group and sex for SHCs and FPCs in 2014.

Figure 46. Number of cases of genital warts reported by SHCs by age group and sex, 2014

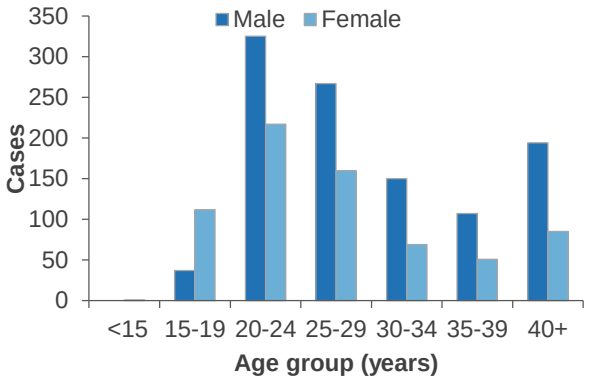
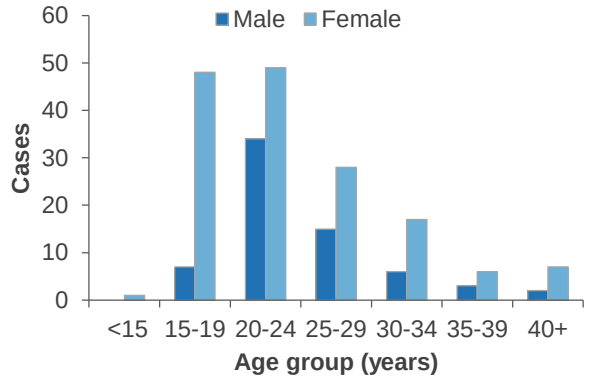


Figure 47. Number of cases of genital warts reported by FPCs by age group and sex, 2014



Ethnicity was recorded by SHCs for 97.6% (1734/1777) of the reported cases of genital warts. The highest percentage of cases reported by SHCs were of European ethnicity (69.4%, 1203 cases), followed by Māori (13.8%, 239 cases), Other (13.1%, 228 cases) and Pacific peoples (3.7%, 64 cases) ethnicity. Ethnicity was recorded by FPCs for 96.0% (217/226) of the reported cases. The highest percentage of cases reported by FPCs were of European ethnicity (70.5%, 153 cases), followed by Māori (18.9%, 41 cases), Other (5.5%, 12 cases) and Pacific peoples (5.1%, 11 cases) ethnicity.

Table 52 presents the number of genital warts cases by ethnicity and clinic setting for 2014.

Table 52. Genital warts (first presentation) cases by ethnicity and clinic type, 2014

Ethnicity	Clinic type	
	SHC	FPC
European	1203	153
Māori	239	41
Pacific peoples	64	11
Other	228	12
Unknown	43	9
Total	**1777**	**226**

Trends in sex, age and ethnicity

Between 2010 and 2014, in SHCs there was a notable decrease in genital warts case numbers in the 15–19 years and 20–24 years age groups, and a moderate decrease in the 25–29 years age group, in both males and females (Figure 48). Case numbers remained stable over the five-year period for all other age groups in males and females. In FPCs, notable decreases were observed among females in the 15–19 years and the 20–24 years age groups. Genital warts case numbers also decreased in the 15–19 years and 20–24 years age groups in males (Figure 49).

Figure 48. Number of genital warts (first presentation) cases in SHCs by sex and age group, 2010–2014

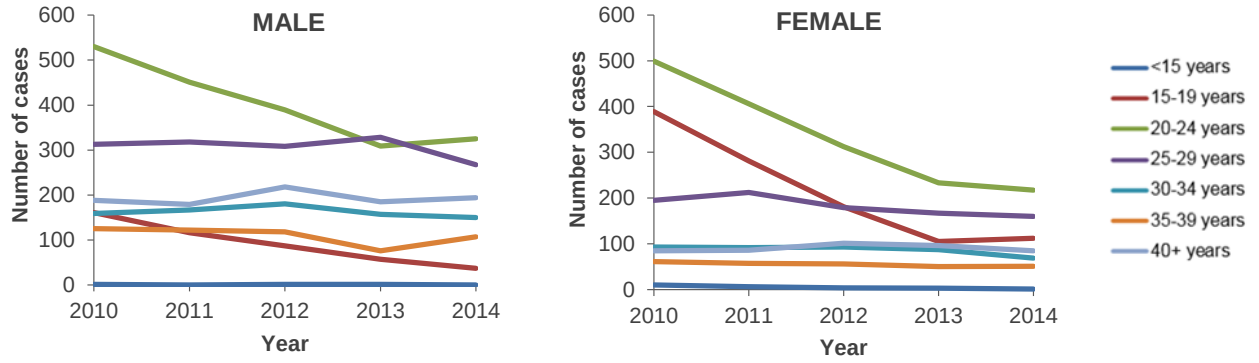


Figure 49. Number of genital warts (first presentation) cases in FPCs by sex and age group, 2010–2014

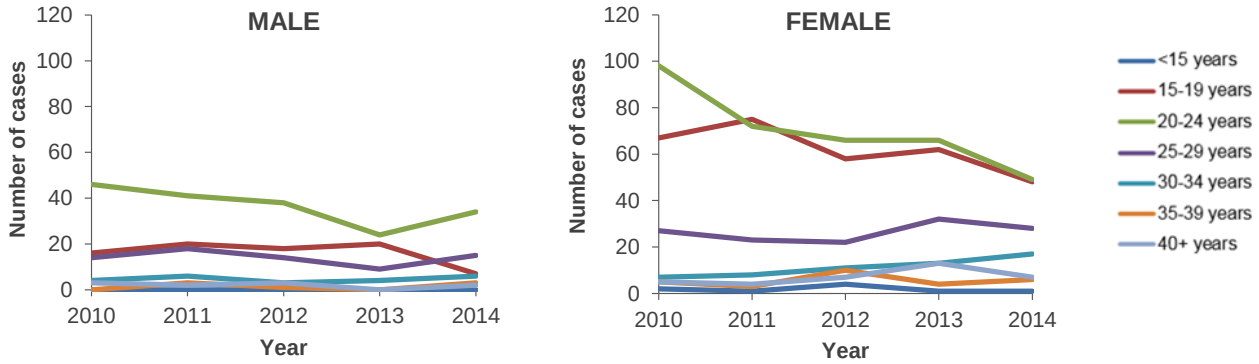


Figure 50 and Figure 51 present genital warts case numbers reported from SHCs and FPCs by ethnicity between 2010 and 2014. In SHCs, there was a decrease in diagnoses in all ethnic groups except Other ethnicity. In FPCs, the number of diagnoses decreased in all ethnic groups.

Figure 50. Number of genital warts (first presentation) cases reported from SHCs by ethnicity, 2010–2014

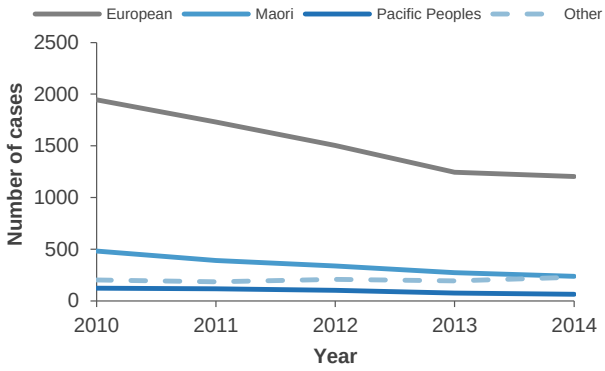
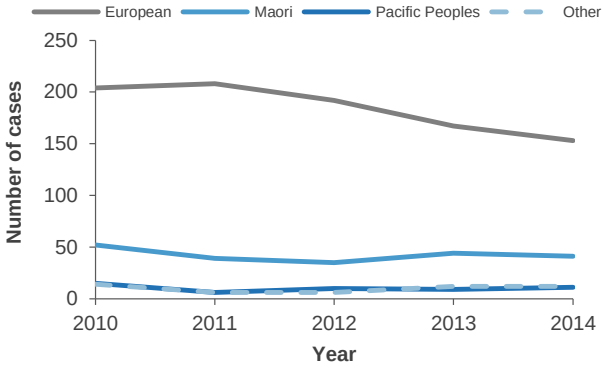


Figure 51. Number of genital warts (first presentation) cases reported from FPCs by ethnicity, 2010–2014



INFECTIOUS SYPHILIS

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INFECTIOUS SYPHILIS

Key findings

- 141 infectious syphilis cases were reported in 2014.
- There was a notable increase in infectious syphilis cases from 2013 to 2014 in SHCs (from 82 to 140 cases).
- The majority of cases were seen in the Auckland region (85 cases) and Canterbury DHB (27 cases).
- 95.7% of cases were male.

Syphilis is a serious infection caused by *Treponema pallidium* 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 fours 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 [22]. Only cases of infectious syphilis (primary, secondary and early latent) are reported by clinics for surveillance purposes.

Clinic surveillance of infectious syphilis

National analysis

2014 analysis

In 2014, the number of infectious syphilis cases reported by SHCs and FPCs were 140 and 1 case respectively (Table 53).

Table 53. Infectious syphilis case numbers by clinic type, 2014

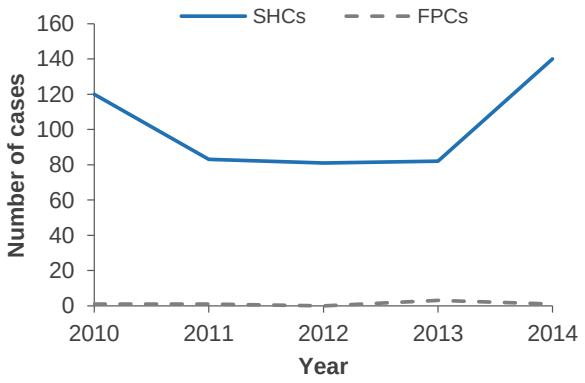
Clinic type	Total number of cases
SHC	140
FPC	1
Total	**141**

Trends in national totals

Between 2013 and 2014, the infectious syphilis case count reported by SHCs increased from 82 to 140 cases.

From 2010 to 2014, the infectious syphilis clinic case count reported by SHCs increased by 16.7% (from 120 to 140 cases) (Figure 52).

Figure 52. Infectious syphilis case numbers by clinic type, 2010–2014



DHB counts

2014 analysis

Clinics in 19 DHBs contributed to infectious syphilis surveillance in 2014. The numbers of infectious syphilis cases seen in SHCs by DHB are presented in Table 54. The highest case numbers of syphilis in SHCs were seen in the Auckland region (85 cases) and Canterbury DHB (27 cases).

Trends in DHB counts

Between 2010 and 2014 SHCs in the Auckland region reported the highest numbers of syphilis cases. Case numbers in the Auckland region increased during 2014 to 85 cases. The number of syphilis cases reported in the Wellington region decreased between 2010 and 2014 from 23 to 3 cases. In 2010 Canterbury reported 8 cases but numbers increased notably in 2012 (to 29 cases) and has remained at a similar level since with 28 cases reported in 2013 and 27 cases in 2014.

Table 54. Infectious syphilis case numbers by DHB and sex, 2014

DHB	Cases	
	Male	Female
Northland	0	0
Auckland region[a]	82	3
Waikato	16	0
Lakes	0	0
Bay of Plenty	5	0
Tairawhiti	0	0
Taranaki	0	0
Hawke's Bay	2	0
Whanganui	1	0
MidCentral	1	0
Wellington region[b]	3	0
Nelson Marlborough	0	0
West Coast	0	0
Canterbury	25	2
South Canterbury	0	0
Southern	0	1
Total	**135**	**6**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

Sex, age and ethnicity distribution of syphilis

2014 analysis

Sex and age were recorded for all cases of infectious syphilis. Of the cases recorded in SHCs, 134 (95.7%) were male and 6 (4.3%) were female. The one FPC case was male (Table 55).

Table 55. Infectious syphilis case numbers by sex and clinic type, 2014

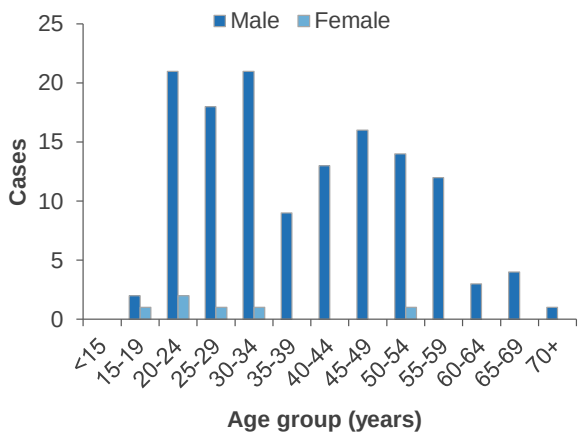
Sex	Clinic type	
	SHC	FPC
Male	134	1
Female	6	0
Total	**140**	**1**

In SHCs, a large proportion (81.4%, 114 cases) of the reported syphilis cases were aged 25 years and over, with a mean age of 38.4 years (range: 18–74 years).

The number of syphilis cases was highest in males aged between 20 and 34 years (60 cases). For females, syphilis case numbers were low with one case reported in each of the 15–19 years, 25–29 years, 30–34 years and 50–54 years age groups. Two cases were reported in females in the 20–24 years age group. Figure 55 presents the number of syphilis cases reported by SHCs by age group and sex for 2014.

The one case reported from a FPC was a male in the 50–54 years age group. Figure 53 presents clinic cases of syphilis by age group and sex for 2014.

Figure 53. Infectious syphilis case numbers reported by SHCs by age group and sex, 2014



Ethnicity was recorded by SHCs for 97.1% (136/140) of the reported cases of syphilis. The highest percentage of cases were of European ethnicity (58.1%, 79 cases), followed by Other (23.5%, 32 cases), Māori (12.5%, 17 cases) and Pacific peoples (5.9%, 8 cases) ethnicity.

The one FPC case was of European ethnicity (Table 56).

Table 56. Infectious syphilis case numbers by ethnicity and clinic type, 2014

Ethnicity	Clinic type	
	SHC	FPC
European	79	1
Māori	17	0
Pacific peoples	8	0
Other	32	0
Unknown	4	0
Total	**140**	**1**

Trends in sex, age and ethnicity

Between 2010 and 2012, SHC syphilis case numbers had been decreasing in males in the 40 years and over age group. From 2013 onwards there was an increase in cases, and from 2013 to 2014 case numbers increased from 37 to 63 (Figure 54). During the five-year period, case numbers in females attending SHCs were low compared with males. The highest number of cases in females between 2010 and 2014 was seen in the 40 years and over age group in SHCs.

Figure 55 presents syphilis case numbers reported from SHCs by ethnicity between 2010 and 2014. Between 2010 and 2014 there was a general increase in case numbers in the European ethnic group (from 56 to 79 cases). Case numbers in the Māori ethnic group have remained low over the five-year period but increased slightly (from 11 to 17 cases), and case numbers in the Pacific peoples ethnic group have decreased (from 17 to 8 cases). In the Other ethnic group case numbers have remained relatively stable.

Figure 54. Number of Infectious syphilis cases in SHCs in males by age group, 2010–2014

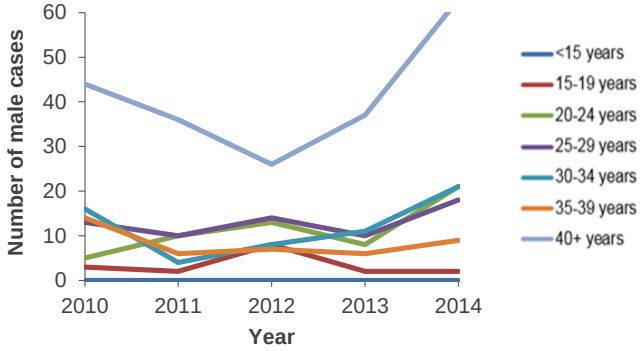
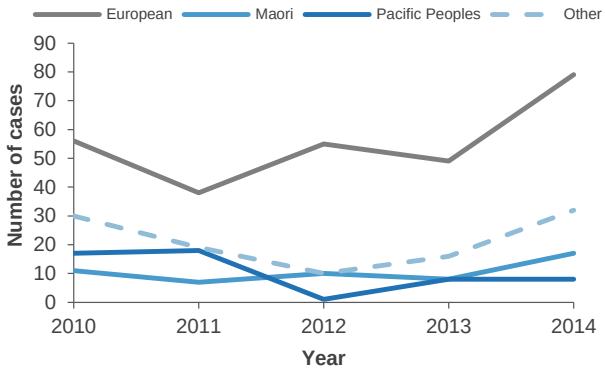


Figure 55. Infectious syphilis case numbers reported from SHCs by ethnicity, 2010–2014



Enhanced surveillance of infectious syphilis

The following analyses are based on data from the enhanced syphilis surveillance. For 2014 this includes all 140 cases reported in the clinic surveillance by SHCs as well as the one case that reported by a FPC, as the case was referred to a SHC for treatment.

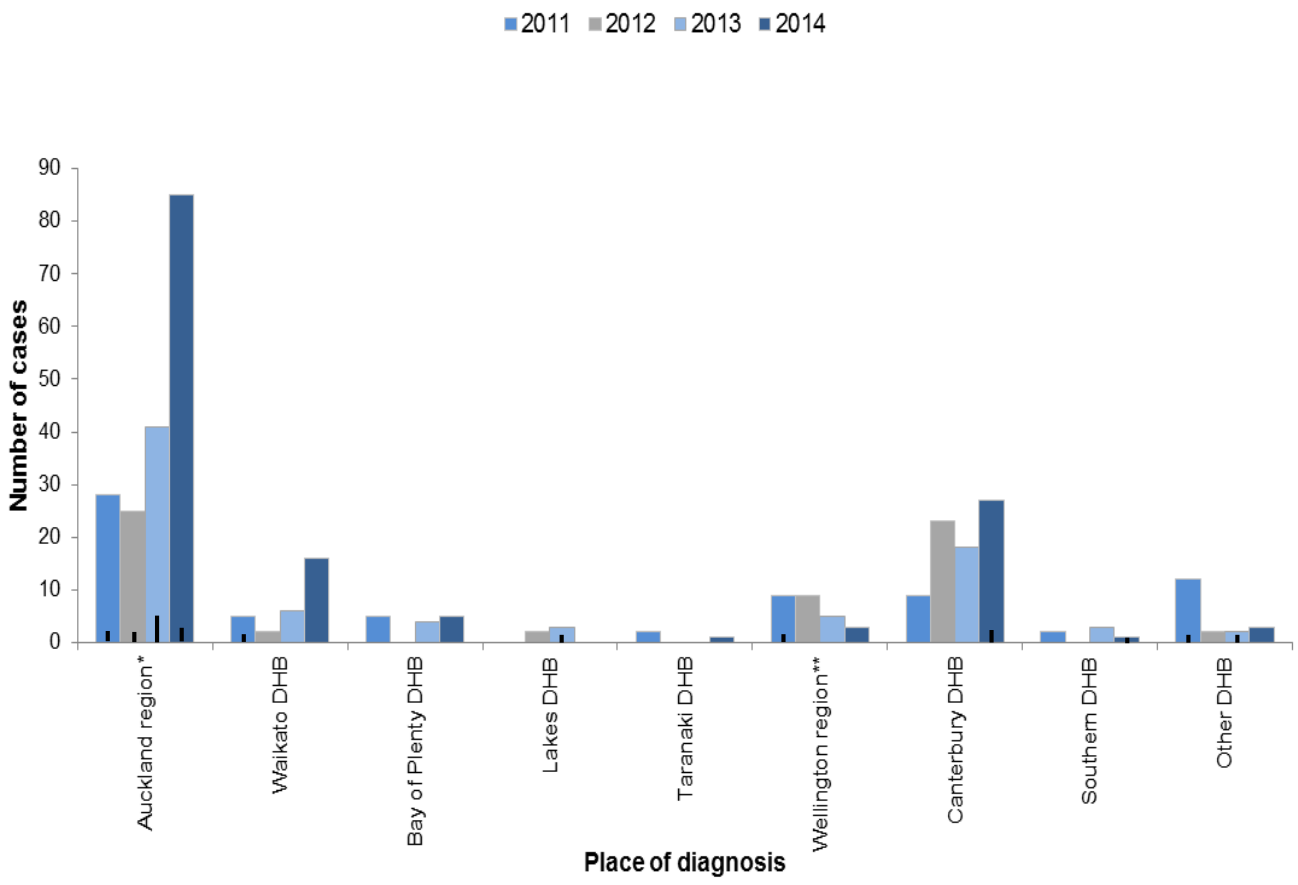
Place of diagnosis

In 2014, the majority of infectious syphilis cases were diagnosed in the Auckland region (85/141 cases). The six female cases reported in 2014 were diagnosed in the Auckland region (3 cases), Canterbury (2 cases) and Southern (1 case) DHBs.

Trends

Since 2011 the number of cases reported has increased (72 to 141 cases). The number of cases increased in the Auckland region (28 to 85 cases), Waikato DHB (5 to 16 cases) and Canterbury DHB (9 to 27 cases). A slight decrease occurred in the Wellington region (8 to 3 cases). Other places of diagnosis have remained more or less stable (Figure 56).

Figure 56. Infectious syphilis case numbers by place of diagnosis, 2011–2014



Age

2014 analysis

The number of males with syphilis was highest in the 20–24 years and 30–34 years age groups (21 cases each) followed by the 25–29 years age group (18 cases). For females, syphilis case numbers were low and occurred in the less than 20 years (1 case), 20–24 years (2 cases), 25–29 years (1 case), 30–34 years age groups (1 case) and 50–54 years (1 case) age groups (Table 57).

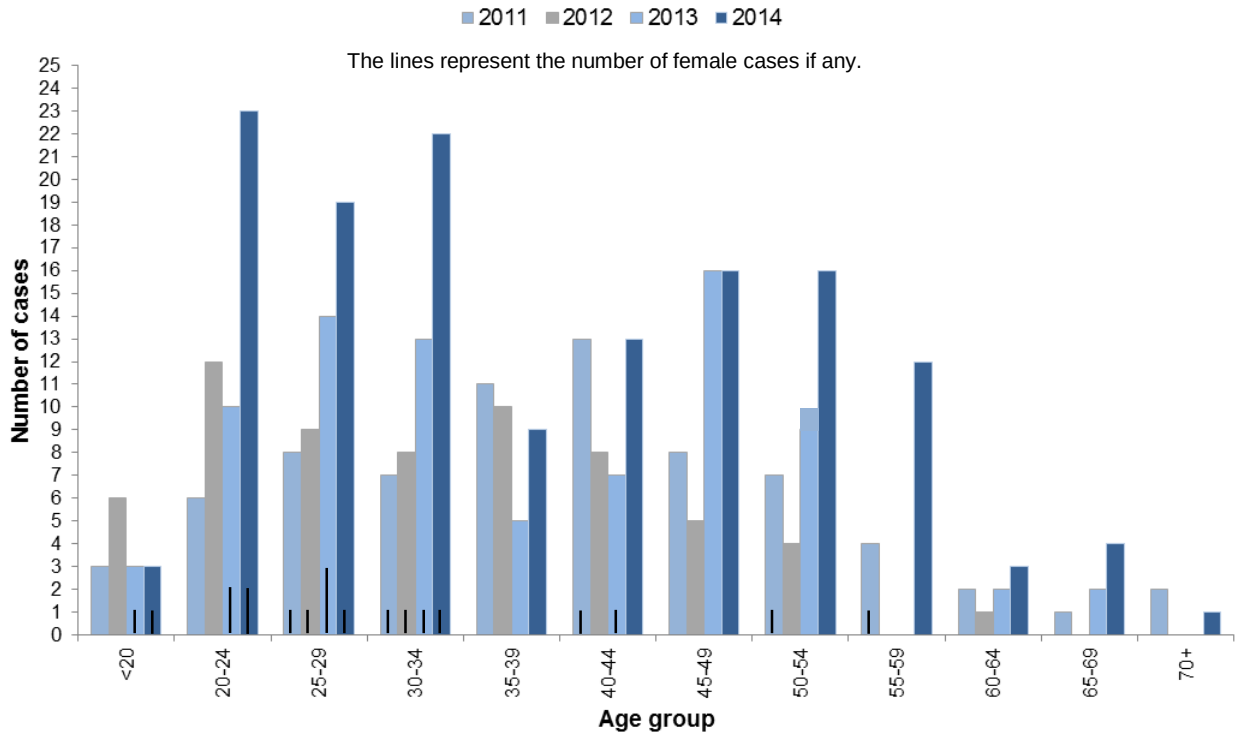
Trends

From 2011 to 2014 case numbers increased in almost all age groups. The largest increase since 2011 occurred in the 20–24 years age group (6 to 23 cases), followed by the 30–34 years (7 to 22 cases) and the 25–29 years (8 to 19 cases) age groups. Case numbers in the less than 20 years and 70 years and over age groups remained low and fairly stable (Figure 57).

Table 57. Number of infectious syphilis cases by age group and sex, 2014

Age group (years)	Male	Female	Total
<20	2	1	3
20–24	21	2	23
25–29	18	1	19
30–34	21	1	22
35–39	9	0	9
40–44	13	0	13
45–49	16	0	16
50–54	15	1	16
55–59	12	0	12
60–64	3	0	3
65–59	4	0	4
70+	1	0	1
Total	**135**	**6**	**141**

Figure 57. Infectious syphilis case numbers by age group, 2011–2014



Sexual behaviour

2014 analysis

Sexual behaviour for the 12 months prior to diagnosis was recorded for all cases except one. Of the male cases 89.6% (121/135) were men who had sex with men (MSM) including 14 cases who also had sex with females. All females for which sexual behaviour information was recorded (83.3%, 5/6) were heterosexual (Table 58).

Table 58. Number of infectious syphilis cases by sexual behaviour and sex, 2014

Sexual behaviour[a]	Male	Female	Total
Same sex partners only	107	0	107
Opposite sex partners only	14	5	19
Both opposite and same sex partners	14	0	14
Unknown	0	1	1
Total	**135**	**6**	**141**

[a] Sexual behaviour in the past 12 months.

Trends

There has been little change in the sexual behaviour reported in infectious syphilis cases from 2011 to 2014 with the majority of cases reported as MSM and all female cases reported as heterosexual. Two male cases in 2012 were reported with unknown sexual behaviour, and therefore are not included in the analyses.

Ethnicity

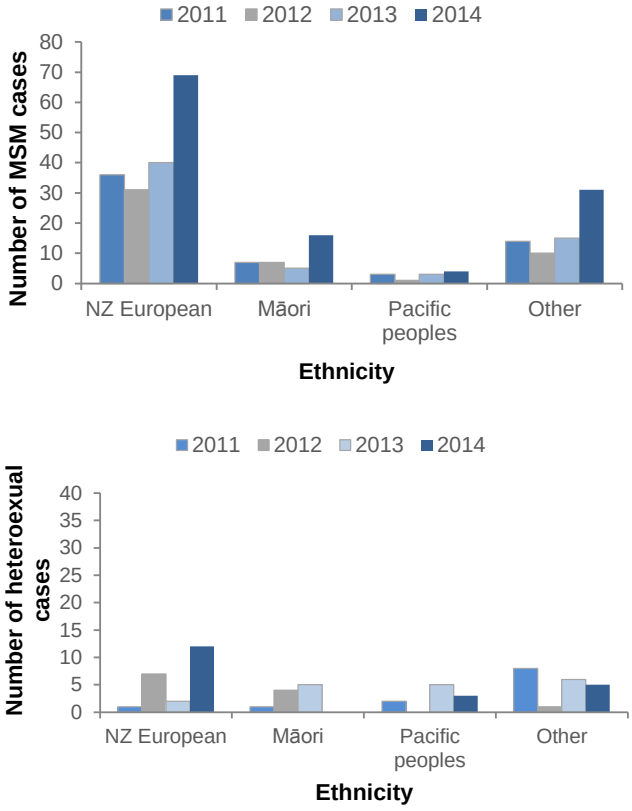
2014 analysis

Ethnicity information was recorded in the enhanced surveillance questionnaires for all cases except for one MSM case. The main ethnic group reported in MSM cases was NZ European (57.0%), followed by Asian and Māori (13.3% each), Other (12.4%) and Pacific peoples (3.3%) ethnic groups. The pattern was different for heterosexual cases where, although the main ethnic group reported was NZ European (60.0%), followed by Asian (15.0%) ethnic groups, the Pacific peoples ethnic group also reported 15.0% of cases, followed by the Other ethnic group (10.0%), and there were no heterosexual cases reported in the Maori ethnic group. In both MSM and heterosexual cases there was no pattern to the range that made up the Other ethnicities reported (Table 59).

Trends

The most commonly reported ethnic group for MSM cases remained NZ European from 2011 to 2014. In heterosexual cases there was no distinct pattern over the four 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, 2011–2014



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

2014 analysis

Information on country of infection was recorded for 93.6% (132/141) of cases. Most MSM and heterosexual cases were thought to be infected in New Zealand (86.8% and 65.0%, respectively) (Table 59).

Table 59. Number of infectious syphilis cases by sexual behaviour, country of infection and clinical setting of initial syphilis test, 2014

Country of infection and Clinical setting	MSM	Heterosexual men and women			Total[a]
			Heterosexual men	Heterosexual women	
Ethnicity					
Māori	**16**	**0**	0	0	**16**
Pacific peoples	**4**	**3**	3	0	**7**
NZ European	**69**	**12**	8	4	**81**
Asian	**16**	**3**	2	1	**19**
Other[b]	**15**	**2**	1	1	**17**
Unknown	**1**	**0**	0	0	**1**
Country of infection					
New Zealand	**105**	**13**	8	5	**118**
Australia	**1**	**3**	3	0	**4**
Other	**8**	**2**	2	0	**10**
Unknown	**7**	**2**	1	1	**9**
Clinical setting of initial syphilis test					
Sexual health clinic	**86**	**8**	4	4	**94**
General practice	**15**	**9**	7	2	**24**
NZ AIDS Foundation testing clinic	**1**	**0**	0	0	**1**
Family planning clinic	**0**	**1**	1	0	**1**
Body positive testing clinic	**3**	**0**	0	0	**3**
Infectious diseases clinic	**11**	**1**	1	0	**12**
Other	**5**	**1**	1	0	**6**
Total number of cases	**121**	**20**	**14**	**6**	**141**

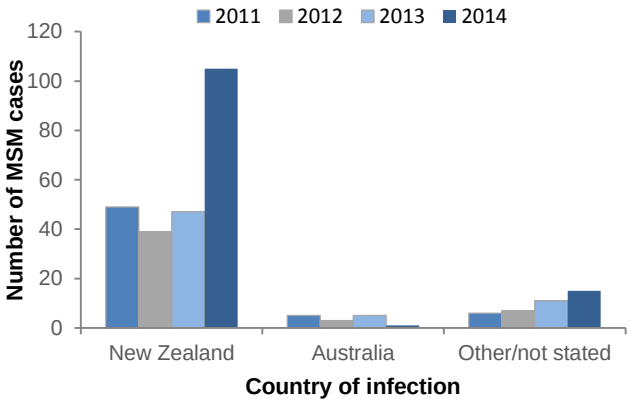
[a] Total includes MSM and heterosexual men and women.

[b] Other ethnicities included African, Australian, British, European, Middle Eastern, Scandinavian, South African and South American.

Trends

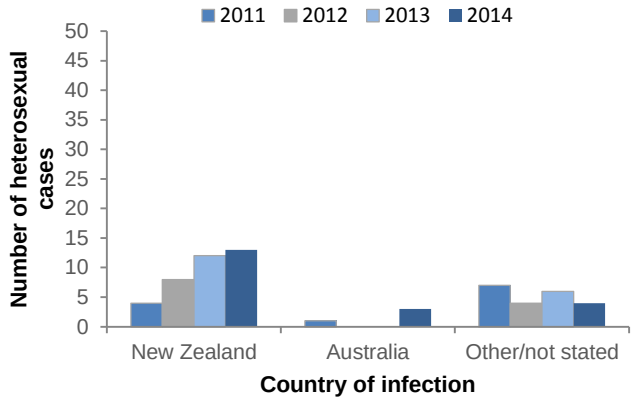
The most common country of infection for both MSM and heterosexual cases remained New Zealand between 2011 and 2014. Australia also remained the next most common country of infection in MSM cases (Figure 59 and Figure 60).

Figure 59. MSM infectious syphilis case numbers by country of infection, 2011–2014



Note: other countries of infection reported in 2014 were Brazil, China, Japan, Thailand, Turkey, the United States of America and Vietnam.

Figure 60. Heterosexual infectious syphilis case numbers by country of infection, 2011–2014



Note: other countries of infection reported in 2014 were China and the Philippines.

Clinical setting of initial syphilis test

2014 analysis

The clinical setting for the initial syphilis test was recorded for all cases (Table 59). Initial testing of MSM cases was most commonly reported in SHCs (86 cases), followed by general practices (15 cases) and infectious disease clinics (11 cases). In heterosexual cases both males and females were more likely to have been tested in general practices (7 cases and 2 cases, respectively) and SHCs (4 cases each). No cases had an initial test at an antenatal clinic in 2014.

Trends

The clinical settings for initial tests have not changed notably over the four years of enhanced syphilis surveillance.

Primary reason for testing

2014 analysis

The primary reason for testing was recorded for all cases (Table 60). The most commonly reported primary reason for testing in MSM cases was clinical symptoms or suspicion (63 cases), followed by asymptomatic STI screening (37 cases) and syphilis contact (10 cases). In heterosexual men the most commonly reported reasons for testing were clinical symptoms or suspicion (10 cases), followed by syphilis contact and immigration purposes (2 cases each). In heterosexual women the most commonly reported reasons were clinical symptoms or suspicion (2 cases), followed by syphilis contact, immigration purposes, asymptomatic STI screening and antenatal screening (1 case each).

Trends

The most commonly reported primary reason for testing in MSM cases remained clinical symptoms or suspicion between 2011 and 2014. This was also the most commonly reported primary reason for testing in heterosexual men. However, for heterosexual women there was no predominant trend in primary reason for testing during the same period.

Symptoms

2014 analysis

Symptom information was recorded for all MSM cases except one, and 60.0% (72/120) reported symptoms. Seventy percent (14/20) of heterosexual cases reported symptoms, of which three were female. The most commonly reported symptom in both MSM and heterosexual cases were genital ulceration (36 cases and 10 cases, respectively) and rash (32 cases and 4 cases, respectively) (Table 60).

Trends

The most commonly reported symptoms have continued to be genital ulceration, rash or lymphadenopathy since 2011. In 2014 two cases reported neurological symptoms, this had not been reported in the previous years. In both 2012 and 2013 all females were reported to be asymptomatic, but in 2014 50.0% (3/6) of female cases were symptomatic.

Rapid Plasma Reagin (RPR) titres

2014 analysis

RPR titre information was recorded for all but three cases (1 MSM and 2 heterosexual cases) (Table 60). The most commonly reported titres in MSM were 1:32 or 1:64 (48 cases) and in heterosexual cases were 1:8 or 1:16 (6 cases).

Trends

RPR titre information was available for all cases except one in both 2011 and 2012, and for all cases in 2013. The most commonly reported titres for MSM cases in 2011 were 1:128 or greater. From 2012 to 2014 the most commonly reported titres were 1:32 or 1:64. In heterosexuals the most commonly reported titres were 1:32 or 1:64 from 2011 to 2013, although in 2012 titres of 1:128 or greater had the same number of cases reported as 1:32 or 1:64.

Table 60. Number of infectious syphilis cases by sexual behaviour and primary reason for testing, symptoms, and RPR titres, 2014

Primary reason for testing, Symptoms and RPR titres	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	Total[a]
Primary reason for testing					
Clinical symptoms or suspicion	**63**	**12**	10	2	**75**
Asymptomatic STI screening	**37**	**1**	0	1	**38**
Syphilis contact	**10**	**3**	2	1	**13**
Immigration purposes	**0**	**3**	2	1	**3**
Antenatal screening	**0**	**1**	0	1	**1**
Other	**11**	**0**	0	0	**11**
Symptoms	**72**	**14**	11	3	**86**
Genital ulceration	**36**	**10**	8	2	**46**
Rash	**32**	**4**	3	1	**36**
Lymphadenopathy	**10**	**2**	2	0	**12**
Neurological symptoms	**2**	**0**	0	0	**2**
Oral ulceration	**1**	**0**	0	0	**1**
Other	**8**	**0**	0	0	**8**
Unknown	**1**	**0**	0	0	**1**
No symptoms	**48**	**6**	3	3	**54**
RPR titres					
0	**10**	**3**	3	0	**13**
1:1, 1:2, 1:4	**17**	**1**	1	0	**18**
1:8, 1:16	**27**	**6**	2	4	**33**
1:32, 1:64	**48**	**5**	3	2	**53**
1:128, 1:256, 1:512	**18**	**3**	3	0	**21**
Unknown	**1**	**2**	2	0	**3**
Total number of cases	**121**	**20**	**14**	**6**	**141**

[a] Total includes MSM and heterosexual men and women.

Concurrent STI diagnoses

2014 analysis

Forty-two (34.7%) MSM cases had a concurrent STI diagnoses of which 22 had chlamydia, seven had gonorrhoea, six had genital warts and one had genital herpes. One (5.0%) heterosexual case had a concurrent STI diagnosis, which was a female with trichomoniasis (Table 62).

Trends

Since 2011 the most commonly reported concurrent STI diagnosis in MSM cases has continued to be chlamydia. Heterosexual cases also reported having chlamydia as a concurrent STI diagnosis but only in very small numbers in both 2012 (3 cases) and 2013 (1 case).

HIV serostatus

2014 analysis

HIV serostatus was recorded for all cases. Thirty-nine (32.2%) MSM cases were HIV seropositive. Two (14.3%) heterosexual male cases were HIV seropositive, and all heterosexual female cases were HIV seronegative (Table 62).

Trends

HIV seropositivity for MSM cases has steadily risen from 19.0% to 32.2% between 2011 and 2014. Two heterosexual cases reported HIV seropositivity both in 2012 and 2014, both of which were male. Infectious syphilis case numbers by HIV serostatus in MSM are presented in Figure 61.

Table 61. HIV seropositivity in MSM infectious syphilis cases, 2011–2014

Year	2011	2012	2013	2014
% HIV positive	19.0	20.8	30.2	32.2

Figure 61. MSM infectious syphilis case numbers by HIV serostatus, 2011–2014

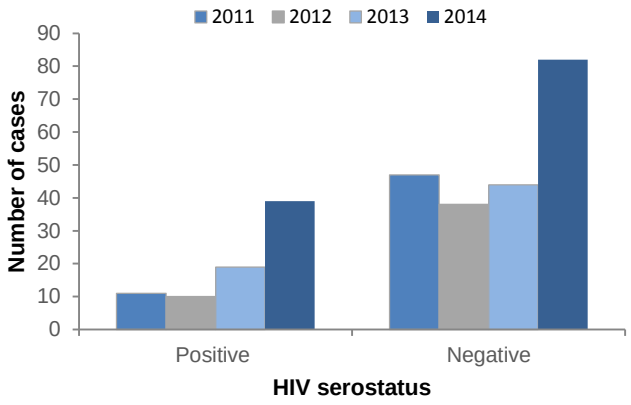


Table 62. Number of infectious syphilis cases by sexual behaviour and concurrent STIs and HIV serostatus, 2014

Concurrent bacterial STIs and HIV serostatus	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	Total[a]
Concurrent bacterial STIs					
Chlamydia	**22**	**0**	0	0	**22**
Gonorrhoea	**7**	**0**	0	0	**7**
Genital warts	**6**	**0**	0	0	**6**
Trichomoniasis	**0**	**1**	0	1	**1**
Genital herpes	**1**	**0**	0	0	**1**
Other	**6**	**0**	0	0	**6**
HIV serostatus					
Positive	**39**	**2**	2	0	**41**
Negative	**82**	**18**	12	6	**100**
Unknown	**0**	**0**	0	0	**0**
Total number of cases	**121**	**20**	**14**	**6**	**141**

[a] Total includes MSM and heterosexual men and women.

Sexual activity

2014 analysis

None of the female cases reported having same sex partners in the three months prior to diagnosis. For MSM the number of same sex partners in the past three months was recorded for 90.1% (109/121) of cases. The majority (63.3%) of MSM cases had two or more sexual partners in the three months prior to diagnosis (Table 63).

The number of opposite sex partners in the three months prior to diagnosis was recorded for all cases except two (Table 63). Eight (6.6%) MSM cases reported having opposite sex partners in the previous three months, of these six reported one partner only. Fourteen (77.8%) heterosexual cases reported having only one opposite sex partner in the previous three months.

Of the cases for which information was recorded (139/141) two cases were recorded as being sex workers (both MSM). Information was recorded for all MSM cases and none were reported as acquiring the infection through a sex worker. However, of the heterosexual cases with information recorded (15/20) one male case was reported as acquiring the infection through a female sex worker (Table 63).

Trends

Between 2011 and 2014 the most commonly reported number of same sex partners in the three months prior to diagnosis in MSM cases, where information was available, 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. One MSM case was reported as acquiring infectious syphilis via a transgender sexworker in 2011. Heterosexual cases were reported as acquiring infectious syphilis via female sex workers in 2012 (1 case), 2013 (2 cases) and 2014 (1 case).

Table 63. Number of infectious syphilis cases by sexual behaviour and sexual activity and sex work, 2014

Sexual activity and Sex work	MSM	Heterosexual men and women	Heterosexual men	Heterosexual women	Total[a]
Number of same sex partners in past 3 months					
0	**6**	**-**	-	-	**6**
1	**34**	**-**	-	-	**34**
2–4	**46**	**-**	-	-	**46**
5–9	**15**	**-**	-	-	**15**
10–15	**5**	**-**	-	-	**5**
16 or more	**3**	**-**	-	-	**3**
Unknown	**12**	**-**	-	-	**12**
Number of opposite sex partners in past 3 months					
0	**113**	**1**	1	0	**114**
1	**6**	**14**	10	4	**20**
2–4	**1**	**3**	1	2	**4**
5–9	**1**	**0**	0	0	**1**
10 or more	**0**	**0**	0	0	**0**
Unknown	**0**	**2**	2	0	**2**
Sex work					
Patient was a sex worker					
Yes	**2**	**0**	0	0	**2**
No	**118**	**19**	14	5	**118**
Unknown	**1**	**1**	0	1	**1**
Acquired through sex worker					
Yes	**0**	**1**	1	0	**0**
No	**107**	**14**	10	4	**107**
Unknown	**14**	**5**	3	2	**14**
Gender of sex worker					
Female	**0**	**1**	1	0	**0**
Total number of cases	**121**	**20**	**14**	**6**	**141**

[a] Total includes MSM and heterosexual men and women.

Context leading to infection

2014 analysis

The context leading to infection was reported for 51 cases (36.2%). The most commonly reported contexts in MSM cases were sex-on-site venues (17 cases), internet-dating (15 cases) and internet-based GPS mobile device apps (14 cases). Information for heterosexual cases was only recorded for five cases and those cases reported Bars and Other as the context leading to infection.

Trends

The most commonly reported contexts leading to infection in MSM cases remained the Internet and Sex-on-site venues between 2011 and 2014. For the majority of heterosexual cases information on context was not provided.

Table 64. Number of infectious syphilis cases by sexual behaviour and context leading to infection, 2014

Context leading to infection	MSM	Heterosexual men and women			Total[a]
			Heterosexual men	Heterosexual women	
Sex-on-site venue	**17**	**1**	1	0	**18**
Internet-based GPS mobile device App	**14**	**0**	0	0	**14**
Internet-dating	**15**	**0**	0	0	**15**
Bar	**4**	**2**	1	1	**6**
Beat	**5**	**0**	0	0	**5**
Other	**7**	**3**	2	1	**10**
Not stated	**76**	**14**	**10**	**4**	**90**

[a] Total includes MSM and heterosexual men and women.

OTHER STIs

E/S/R

THE SCIENCE BEHIND THE TRUTH

OTHER STIs

Key findings

- 755 cases of NSU were reported in 2014 - 21 of these cases were seen in FPCs.
- The number of NSU cases seen in SHCs decreased by 2.1% from 2013 to 2014.
- The mean age of males with NSU in SHCs was 31.7 years in 2014.
- One case of LGV was reported in 2014 in a SHC.

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 [23] [24].

Chancroid

Chancroid is caused by Haemophilus ducreyi. 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 [25].

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 [26].

Clinic surveillance of non-specific urethritis

National analysis

2014 analysis

In 2014, the number of NSU cases reported by SHCs and FPCs were 734 and 21 cases respectively (Table 65).

Table 65. NSU case numbers by clinic type, 2014

Clinic type	Total number of cases
SHC	734
FPC	21
Total	**755**

Trends in national totals

Between 2013 and 2014, NSU case counts reported by SHCs decreased by 2.1% (from 750 to 734 cases) and case counts reported by FPCs increased by 50.0% (from 14 to 21 cases).

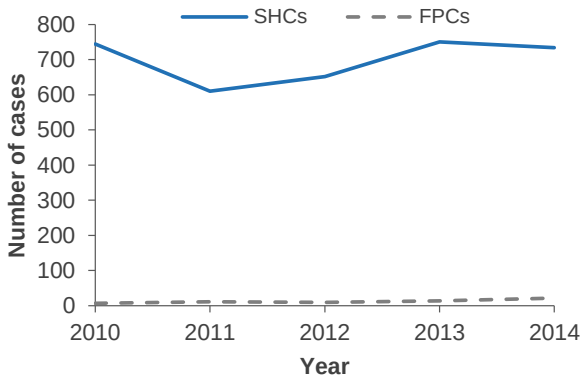
From 2010 to 2014, NSU case counts decreased by 1.3% in SHCs (from 744 to 734 cases) (Figure 62). NSU case counts in FPCs have increased over the five-year period but have remained low.

DHB counts

2014 analysis

Clinics in 19 DHBs contributed to NSU surveillance in 2014. The number of NSU cases in SHCs by DHB is presented in Table 66. The highest number of cases in SHCs were seen in the Auckland (319 cases) and Wellington (103 cases) regions.

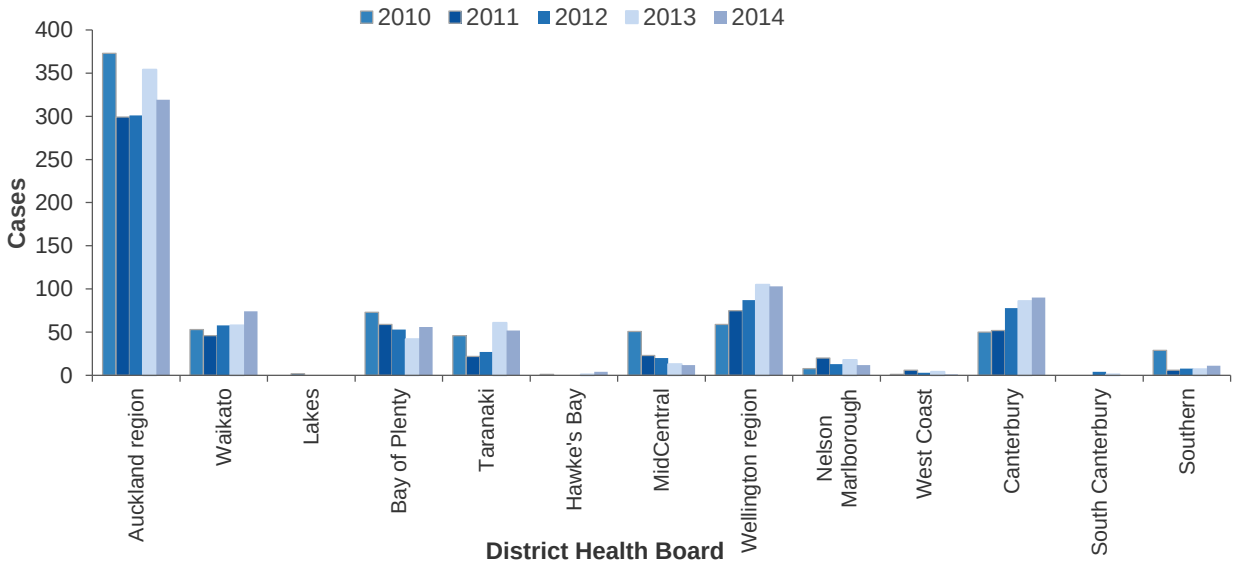
Figure 62. NSU cases by clinic type, 2010–2014



Trends in DHB counts

The number of NSU cases seen in SHCs from 2010–2014 is presented in Figure 63. Variation is seen amongst DHBs, for example there are increasing case numbers over the five year period in the Wellington region and Waikato and Canterbury DHBs, while decreasing case numbers are seen in Bay of Plenty and MidCentral DHBs.

Figure 63. NSU cases reported by SHCs by DHB, 2010–2014



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, Tairawhiti and Whanganui DHBs over the five year period.

Table 66. NSU case numbers in SHCs by DHB, 2014

DHB	Cases
Northland	0
Auckland region[a]	319
Waikato	74
Lakes	0
Bay of Plenty	56
Tairawhiti	0
Taranaki	52
Hawke's Bay	4
Whanganui	0
MidCentral	12
Wellington region[b]	103
Nelson Marlborough	12
West Coast	1
Canterbury	90
South Canterbury	0
Southern	11

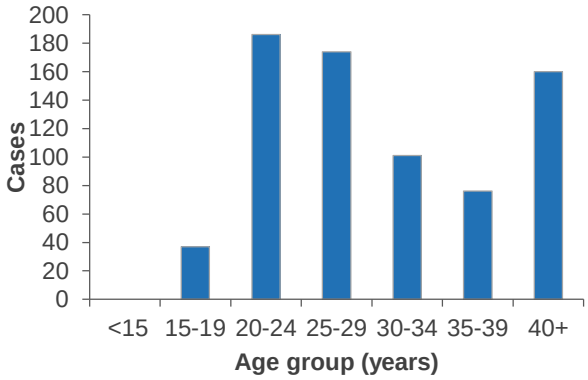
[a] Waitemata, Auckland and Counties Manukau DHBs.
[b] Hutt Valley and Capital & Coast DHBs.

Age and ethnicity distribution of NSU

2014 analysis

Age was recorded for all NSU cases in 2014. In SHCs, 30.4% (223/734) of the reported cases of NSU were aged less than 25 years. The proportion of cases aged less than 25 years was larger in FPCs (66.7%, 14/21). The mean age of NSU cases was 31.7 years in SHCs and 24.5 years in FPCs. Figure 64 presents the number of NSU cases reported by age group for SHCs in 2014.

Figure 64. NSU case numbers reported by SHCs by age group, 2014



In SHCs, ethnicity was recorded for 97.7% (717/734) of the reported cases of NSU. The highest percentage of cases were of European ethnicity (71.1%, 510 cases), followed by Other (13.5%, 97 cases), Māori (11.3%, 81 cases) and Pacific peoples (4.0%, 29 cases) ethnicity (Table 67).

Table 67. NSU cases numbers by ethnicity and clinic type, 2014

Ethnicity	Clinic type	
	SHC	FPC
European	510	13
Māori	81	5
Pacific peoples	29	1
Other	97	1
Unknown	17	1
Total	**734**	**21**

Trends in age and ethnicity

From 2010 to 2014, case numbers decreased in every age group except the 25–29 years and 30–34 years age groups, where numbers increased (from 145 to 174 and 77 to 101 cases, respectively) (Figure 65). Case numbers were very low in the under 15 years age group.

Figure 65. Number of NSU cases in SHCs in males by age group, 2010–2014

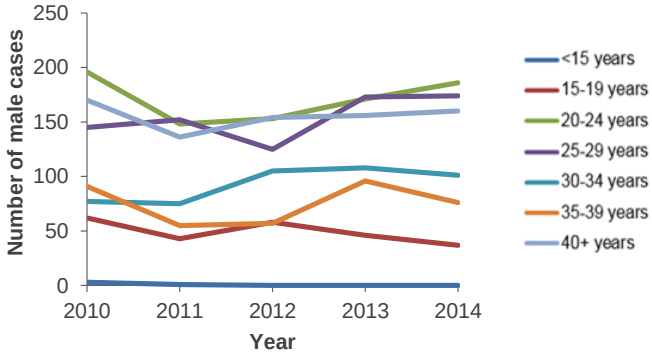
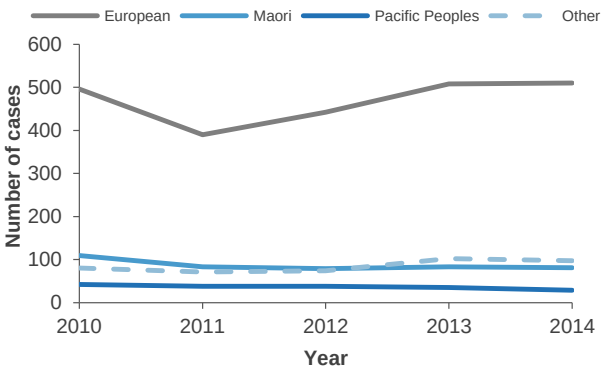


Figure 66 presents NSU case numbers reported from SHCs by ethnicity between 2010 and 2014. Since 2010, case numbers increased in the Other (from 80 to 97 cases) and European (496 to 510 cases) ethnic groups. Case numbers decreased in the Pacific peoples (from 42 to 29 cases) and Māori (from 109 to 81 cases) ethnic groups.

Figure 66. Number of NSU cases reported from SHCs, by ethnicity, 2010–2014



Clinic surveillance of lymphogranuloma venereum, chancroid and granuloma inguinale

National analysis

2014 analysis

One case of lymphogranuloma venereum (LGV) and no cases of chancroid or granuloma inguinale (GI) were reported in 2014. The LGV case was reported by a SHC in Waikato DHB, in a male 25 years of age and of European ethnicity.

Trend analysis

Between 2010 and 2014, five cases of LGV, one case of chancroid and one case of GI were reported by SHCs.

The chancroid and GI cases were reported by SHCs in 2010. The chancroid case was reported in Bay of Plenty DHB, in a male 22 years of age and of European ethnicity. The GI case was reported in Hawke's Bay DHB, in a female 18 years of age and of European ethnicity.

In 2010 one LGV case was reported in MidCentral DHB, in a female 17 years of age and of Pacific peoples ethnicity. 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 as detailed above.

DISCUSSION

DISCUSSION

Chlamydia

Chlamydia was the most commonly reported STI in New Zealand in 2014 with an incidence rate of 629 per 100,000 population, a non-significant decrease from the 2013 rate of 637 per 100,000 population. The laboratory-based estimated national chlamydia rate had been stable between 2009 and 2011, followed by a decrease in 2012. Although the 2013 incidence rate was a marked decrease from the estimated 2012 rate some of this decrease may have been due to the introduction of new data processing methods for collection of 2013 data (exclusion of repeat tests for an individual within a defined episode period). The proportion of positive specimens excluded as repeat tests in 2013 and 2014 was similar (5.8%, and 5.9%, respectively). As repeat tests were not excluded for the estimated incidence for 2009–2012, the true incidence for 2009–2012 is likely to have been lower than that reported. It is reassuring that the decrease first noted in 2012 has been maintained over these two years of directly comparable collection (data was available from all DHBs and with exclusion of repeat tests by episode). Although the decrease in incidence from 2013 to 2014 was not significant, it is reassuring that there has been no increase in incidence given that testing rates in the high risk age groups of 20–24 and 25–29 years increased from 2013 to 2014.

It is difficult to interpret the decrease in overall test positivity from 7.8% in 2013 to 7.5% in 2014 as, although test positivity may be used as a proxy for prevalence, the usefulness of these estimates may be affected by a range of variables, including testing rates, testing venues, and ethnicity [27].

Although the incidence rate of chlamydia in females in the 15–19 years age group has continued to show a steady decline since 2010, this group continues to have the highest incidence rate by age group and sex at the national level. Testing rates by age group were able to be calculated for the first time in 2013, and in 2014 had decreased slightly for males and females in the 15–19 years age group but increased for both sexes in older age groups [28]. Coverage rates were calculated for the first time in 2014 in the highest incidence age groups (15–19 years, 20–24 years and 25–29 years) by removing repeated tests for each unique individual, and these rates indicate that less than 10% of males but between 23% and 38% of females had at least one annual test in these age groups. These rates were almost all below the level mathematical modelling has suggested is required to decrease chlamydia prevalence (annual testing of 30–40% of people in the high risk age groups) and were generally lower than 2014 testing rates for England but higher than that reported from Australia [29-33]. It is important to note that the assumptions used in these various models have not been verified for the New Zealand population.

Ethnicity analysis of laboratory-based surveillance data showed estimated rates were highest in the Māori and Pacific peoples ethnic groups, particularly in the high risk age groups (15–29 years). These findings were consistent with the proportionately higher case numbers reported for Māori and Pacific peoples ethnic groups in clinic-based surveillance since 2010, and higher prevalence than other ethnic groups found in published studies [34]. In general, population-level testing rates for males and females in the highest risk age groups were highest in the Māori ethnic group and for females these were above the level predicted in modelling studies to decrease prevalence [30]. However, a significant number of people were tested more than once, with Māori females in the high risk age groups showing the largest decreases (up to 38%) when annual testing coverage rates were calculated. This means the 2014 testing coverage for those recommended to be screened annually is lower than the level predicted to have an impact on prevalence. Further analysis of repeatedly positive test results, along with testing coverage rates, may provide insights into the contribution of repeated infections to ongoing higher test positivity for Māori and Pacific peoples ethnic groups.

Although laboratory-based surveillance showed a decrease in incidence rate in recent years, the chlamydia clinic case numbers reported by Family Planning Clincis (FPCs) increased by 5.1% between 2013 and 2014. However during this time the number of clinic visits increased by 9.7% which suggests a decreased prevalence

among those attending the FPCs. During the same period the chlamydia clinic case numbers reported by Sexual Health Clinics (SHCs) decreased by 3.7% and the number of clinic visits decreased by 0.02%, which suggests a decreased prevalence among those attending SHCs.

Gonorrhoea

The 2014 estimated national rate of gonorrhoea (70 per 100,000) showed a further 9.8% decrease from the 2013 rate (78 per 100,000). But this rate remains 7.4% higher than the estimated rate in 2010, after which time nucleic acid amplification testing (NAAT) for gonorrhoea testing was introduced in many laboratories. New data processing methods that allow for exclusion of repeat tests for an individual within a defined episode period will account for some of the decrease seen in the national rate starting in 2013. As repeat tests were not excluded for the estimated incidence for 2010–2012, the true incidence for 2010–2012 is likely to have been lower than that reported. This data suggests that the increase in the national rate seen from 2010–2012 is likely to be a result of the change in gonorrhoea laboratory testing practices leading to increased detection of infections rather than a sudden increase in the overall burden of gonorrhoea. This is supported by the continuing decrease in incidence rates in 2013 and 2014.

The decrease in the estimated national rate from 2013 to 2014 was not evenly distributed across all age groups and both sexes, with notable increases in males in the 20–24 years, 25–29 years and 30–34 years age groups. Testing rates by age group and sex were able to be calculated for the first time in 2013, and the 2014 national population testing rates for males and females were similar to the 2013 rates [28]. However in 2014 the testing rates had increased in males in the 20–24 years and 30–34 years age groups, and for both sexes in the 25–29 years age groups. This increased testing may explain the increased incidence for males in these age groups.

For the few DHBs that showed a significant overall increase in rates from 2013 to 2014, the pattern of change varied, with the increase in Waikato DHB across all age groups but with a greater increase in males compared with females, whereas the increased rates in MidCentral and Nelson Marlborough DHBs occurred in those aged 15–29 years, with a greater increase overall in females compared with males. In several DHBs that had a small overall decrease in rate between 2013 and 2014 there were notable variations in the rate changes for one sex and/or in specific age groups. For instance the Wellington region had a greater decrease in the female rate and an increase in the rate for those aged 25–39 years; Canterbury DHB had an increase in the male rate and also for those aged over 35 years; and Southern DHB showed no decrease in the male rate and an increase in those in the 15–19 years age group. It is also of interest that although most DHBs had higher rates in females, the estimated national rate was higher for males and this was driven by higher rates in males in the Auckland and Wellington regions and Wairarapa, Canterbury, South Canterbury and Southern DHBs. During this same period both Auckland and Canterbury SHCs have reported a notable increase in syphilis case numbers for males.

Coverage rates were calculated for the first time in 2014 in the highest incidence age groups (15–29 years) by removing repeated tests for each unique individual, and, similarly to coverage rates for chlamydia testing, these rates indicate that less than 10% of males but between 23% and 38% of females had at least one annual test in these age groups.

Ethnicity analysis of laboratory-based surveillance data was undertaken for the first time in 2014 and this showed that overall the highest estimated rates were in the Māori and Pacific peoples ethnic groups for both males and females and these findings held across the highest risk age groups (15–29 years). Similarly the percentages of positive specimens for males and females in the high risk age groups, where ethnicity information was able to be retrieved, were also highest in the Māori and Pacific peoples ethnic groups. These findings are consistent with the proportionately higher case numbers reported for the Māori ethnic group in clinic-based surveillance since 2010 but are higher than expected for the Pacific peoples ethnic group.

In general, testing rates for males and females in the high risk age groups were highest in the Māori ethnic group, not unexpectedly a similar

finding to testing rates for chlamydia. However this group also showed the largest decreases (36–42% in females) when calculating annual testing coverage. This suggests that fewer Māori females in the high risk age groups are having an annual test than may be expected by looking at the population testing rates. Further analysis may be useful to see what proportion of repeat tests are in those with positive tests and, of these, how many have repeated positive specimens.

The 3.2% decrease in gonorrhoea clinic case numbers reported by SHCs between 2013 and 2014 was consistent with the decrease in the estimated incidence rate from 2013 to 2014 seen in laboratory-based surveillance. During this time the number of clinic visits decreased by only 0.02% which suggests a true decrease in prevalence among those attending the SHCs. Although during the same period the gonorrhoea clinic case numbers reported by FPCs increased by 2.4%, the number of clinic visits increased by 9.7%, which also suggests a decreased prevalence among those attending FPCs.

Site of infection data is collected in both the clinic and laboratory-based surveillance and the data show a trend in males for an increase in the proportion of positive samples from anorectal and throat sites from 2010 to 2014. It would be useful to be able to collect data on sexual behaviour to ascertain if this increase is among MSM. For females, case numbers are low but there is a similar trend in the laboratory-based data with an increasing proportion of positive throat samples over the same period.

In 2012, the World Health Organization released an action plan in response to growing concerns about antimicrobial resistant gonorrhoea, especially emerging resistance to ceftriaxone [35]. No ceftriaxone resistance has been detected among *Neisseria gonorrhoeae* in New Zealand as yet. However, an isolate with decreased susceptibility to ceftriaxone was confirmed from Canterbury DHB in 2014, and previous confirmations of isolates with decreased susceptibility have been reported from the Auckland region and Waikato DHB. Although improved surveillance of the antimicrobial susceptibilities of *N. gonorrhoeae* isolates in New Zealand was implemented in 2013, with most laboratories supplying antimicrobial susceptibility data with their routine monthly STI surveillance data, the increased use of NAAT testing has led to a marked decrease in the number of isolates available for antimicrobial susceptibility testing. It is of concern that this decrease (422 isolates in 2013 to 208 isolates in 2014), may reduce our ability to recognise changes in resistance patterns in a timely manner.

Genital herpes

Over the past five years, there has been a decreasing trend in cases of genital herpes reported in SHCs in both males and females but notable increases in cases in males aged 40 years and over and in females aged 30 years and over. However, in FPCs over the same time period, there has been an overall increase in cases reported, with the most notable increases in females in the younger age groups, specifically those aged 15–34 years. This difference probably reflects the differing clientele accessing services at these clinics. The variation seen across DHBs, with increasing numbers reported by SHCs in the Wellington region and Canterbury DHBs, is interesting as both of these regions also show an increasing trend in chlamydia, gonorrhoea and NSU cases reported by SHCs for the same time period. As this is a disease that may predispose transmission of HIV infection it would be useful to collect information on sexual behaviours and activity from the cases.

Genital warts

The decreasing trend in the number of cases of genital warts in both clinic types continued in 2014. Since 2010 this decreasing trend has been most notable in females and males aged 15–19 years and 20–24 years age groups. These decreases follow the introduction of HPV vaccine onto the routine immunisation schedule for girls aged 12 years from late 2008, along with a vaccination programme targeting girls born on or after 1 January 1990 [36]. The decline in genital warts cases in the clinic data is consistent with findings from Australia where quadrivalent HPV vaccine has been funded for girls and young women since 2007. HPV vaccine is not currently available for boys free of charge in New Zealand, but has recently been introduced for boys in Australia [37].

Infectious syphilis

Trends in STIs are important because they are a marker for behaviours associated with HIV transmission. Co-infection is known to be important as the risk of HIV acquisition and transmission is increased if genital ulceration is present [5]. This is particularly true for syphilitic ulcers [38]. High rates of HIV co-infection have been documented in syphilis outbreaks overseas, ranging from 20 to 70 percent [39].

There were 141 infectious syphilis cases reported in 2014, a large increase from the 85 cases reported in 2013. Although syphilis case numbers, as reported in the clinic-based sentinel surveillance, appeared to have declined between 2010 and 2013, data collected as part of the enhanced syphilis surveillance since 2011 is likely to give a truer indication of the trend due to use of the revised and standardised case definition by all SHCs. Enhanced surveillance data showed an increasing trend in the number of cases reported over the past four years from 72 cases in 2011 to 141 cases in 2014. All 2014 cases were able to be matched and reconciled with syphilis cases reported as part of ESR's 2014 sentinel STI surveillance.

Data from enhanced syphilis surveillance shows that, similar to previous years, the majority of cases reported in 2014 were male (135/141, 95.7%) and concentrated in MSM living in the main centres, with the highest numbers reported from the Auckland region and Christchurch DHB. The highest number of MSM cases (and also for all male cases) was in the 20–24 years and 30–34 years age groups, whereas in 2013 the highest numbers were in the 45–49 years age group. This is somewhat similar to what has been reported by the AIDS Epidemiology Group (AEG) for MSM reported as newly diagnosed with HIV infection in 2014, where 35% were aged under 30 years. This is a higher percentage than was reported by AEG for any of the older 10 year age groups [40]. An increase in diagnoses of either disease in younger age groups is of concern.

Although MSM diagnosed with infectious syphilis at SHCs in 2014 were most likely to be of NZ European ethnicity (57.0%), the proportion of cases in the Asian and Māori ethnic groups increased to 13.2% (from 9.7% and 8.1%, respectively, in 2013) [41]. MSM cases belonging to the Pacific peoples ethnic group remained low (3.3%) and the remainder, usually single cases, belonged to a diverse range of other ethnicities. This pattern is very similar to the ethnic groups reported by AEG for MSM newly diagnosed with HIV infection in 2014 where 60% were European/Pakeha ethnicity, followed by 15% Asian (decreased from 23.9% in 2013), 13% Māori (increased from 7.1% in 2013) and 5% Pacific peoples ethnicities [40]. The increase in the proportion for MSM syphilis cases reporting Asian ethnicity (now a similar proportion as was reported for HIV cases in 2013) is difficult to interpret without data on syphilis cases diagnosed outside of SHCs but may indicate that this group has been more likely to attend an SHC for testing or screening during 2014.

The proportion of MSM who reported symptoms (60.0%), most commonly genital ulceration or rash, has decreased from 65.1% in 2013 [41]. This highlights the importance of routine screening for high risk groups, particularly MSM, and and contact follow up. Unlike 2012 and 2013, when no women reported symptoms, three of the six female cases reported symptoms in 2014 (genital ulceration and rash) but the remaining cases were found through contact tracing or asymptomatic screening, including for immigration purposes and antenatal care. This suggests that there are may be other women who remain undiagnosed.

Most 2014 cases (118/141, 83.6%) reported they were infected in New Zealand, whereas 14 cases reported infection in another country, and for nine cases the country of infection was reported as unknown. Australia was reported as the country of infection for one MSM and for three heterosexual cases.

Information on the context of infection was not recorded for 64.5% of MSM and 75.0% of heterosexual cases. Where it was known for MSM, the most commonly reported contexts were sex-on-site venues, internet dating and internet-based GPS mobile device applications. Use of GPS mobile apps was reported more commonly than in 2013 and this increase is consistent with reports from overseas where such apps have been reported as important drivers of transmission. Use of these applications is thought to join previously isolated sexual networks and reduce the time for outbreaks to evolve [42].

In 2014, 34.7% of MSM syphilis cases had a concurrent STI diagnosis and 32.2% were reported to be HIV seropositive. The proportions were much lower for heterosexual cases among whom 5.0% had a concurrent STI and 10.0% (2 cases) were reported to be HIV seropositive. The proportion of MSM infectious syphilis cases with HIV co-infection is now considerably higher than was found in the Auckland study of 2002–2004 (4/40, 10.0% MSM syphilis cases were also HIV seropositive) and the 2011 enhanced surveillance findings (19.0% of MSM syphilis cases were also HIV seropositive) [5, 6]. This increase in HIV co-infection amongst MSM syphilis cases has also been noted in overseas surveillance, where co-infection rates typically range from 30–60% [43]. Co-infection is known to be important as the risk of HIV acquisition and/or transmission is increased if genital ulceration is present. Oral sex has been reported to be a risk reduction strategy for HIV transmission among MSM (both seropositive and seronegative) in other countries where one analysis of syphilis cases partially attributed increasing syphilis rates to this practice [5, 43].

It would be useful for planning health promotion interventions to have information about risk factors, such as frequency of screening, and "risk reduction" strategies, such as use of oral sex and serosorting. It has been suggested that these questions could be incorporated into the enhanced surveillance questionnaire. However some of this information has already been collected in surveys such as the Gay Auckland Periodic Sex Survey and the Gay Online Sex Survey and it may be more appropriate that these more detailed sexual activity and attitudinal questions are covered in such surveys [44-46].

Other STIs

In a similar pattern to that seen for genital herpes, the number of cases of non-specific urethritis reported by SHCs over the past years has decreased but the numbers reported by FPCs has increased. Although the pattern for distribution of cases reported by SHCs shows a similar trend across DHBs to genital herpes, the age group trends are different with an increasing trend in males in those aged 25–34 years compared with the increasing trend for males with genital herpes in the older age groups.

It is of interest that the four cases of lymphogranuloma venereum (LGV) reported by SHCs in 2013 and 2014 were part of a five case series published in the New Zealand Medical Journal in 2015 [24]. All five cases (case five was diagnosed and managed by a general physician) were reported to be MSM and four of the five reported no overseas travel. This suggests local transmission and these cases highlight the need for enhanced surveillance to understand when and where new or changed strategies are required for STI control.

At risk groups

As in previous years, those aged less than 25 years showed a disproportionate burden of STIs in 2014. The highest numbers and rates for each STI were consistently in the 15–19 years, 20–24 years and 25–29 years age groups, with much lower numbers and rates in older age groups both in the clinic and laboratory surveillance data. The exception to this was syphilis where, although the highest case counts were in the 20–24 years, 25–29 years and 30–34 years age groups, the case counts in each 5 year age group for those aged 40–60 years were only marginally lower and there were few cases aged under twenty years.

Neonatal chlamydia and gonorrhoea cases continue to occur with laboratory data reporting 83 chlamydia cases and one gonorrhoea case aged less than one year in 2014. These neonatal infections highlight the need to improve STI screening during pregnancy.

Based on surveillance data reported by participating clinics, there were also on-going differences in the presentation of bacterial and viral STIs by ethnicity. Those of non-European ethnicity showed a higher burden of bacterial STIs (gonorrhoea and chlamydia) while those of European ethnicity showed a higher burden of viral STIs. Again, the exception to this was syphilis where the highest number of cases was reported in the European ethnic group. However as many STIs are frequently asymptomatic these differences may reflect access to healthcare rather than true differences in disease burden. Laboratory-based surveillance data for chlamydia and gonorrhoea also showed a higher burden of disease for those of non-European ethnicity.

Information from enhanced syphilis surveillance from participating clinics showed that the main burden of infectious syphilis was in MSM. A report on 2014 STI surveillance from the United Kingdom discussed the sharp rise in STI diagnoses in MSM and noted that these now account for most of the recent increases seen in STI diagnoses among men [29]. In particular it was noted that gonorrhoea was the most commonly diagnosed STI in MSM in 2014 and that this was of concern, given the increasing resistance or decreased susceptibility to antibiotics used for treatment [29].

STI surveillance system limitations and improvements

Reporting was available from all DHBs for chlamydia and from all but one DHB for gonorrhoea since 2013. This meant that from 2013 the national rate for chlamydia has no longer been an estimate and the estimated national rate for gonorrhoea has been based on 19 out of 20 DHBs. This is a significant achievement given that STIs are not notifiable and the STI surveillance system relies on the voluntary involvement of diagnostic laboratories.

New data processing methods allowed for removal of repeat tests within a specified timeframe for laboratory-based data from 2013, meaning that the incidence rate now reflects new infections, rather than retesting of an on-going infection. However this does mean that analysis of trend data must be approached with caution as repeat tests were not removed in previous years.

Additional information provided on negative STI tests has broadened the scope for reporting testing rates and test positivity rates and these have been analysed by age and sex since 2013. However it must be noted that the numerator for population testing rates was the number of tests in a given population, not individuals tested and this has been shown to over-estimate testing coverage [47]. Where available, the NHI or clinic identifier was used to remove all repeat tests for an individual so that annual testing coverage rates (people tested per 1000 population) for the 2014 data could be analysed. However these results should be interpreted with caution as the proportion of tests with missing NHIs or other identifiers varied considerably between the different DHBs.

In previous reports information on the burden of STIs by ethnicity relied on count data from clinic sources. However NHI numbers, collected as part of the laboratory data entered and stored on the Sharepoint portal website since 2013, was used to retrieve ethnicity information from the Ministry of Health and this was used for analyses by ethnicity of chlamydia and gonorrhoea laboratory-based data for 2014. These results should be interpreted with caution as although over 93% of all specimens had an NHI, the percentage was lower for positive tests (chlamydia, 89.6% and gonorrhoea, 81.3%, respectively), and the proportion of missing NHIs varied considerably among the different DHBs.

Data collected as part of enhanced syphilis surveillance from 2011 to 2014 has been analysed and incorporated into this report for the first time this year. This has meant that information on sexual behaviour and other possible risk factors has been presented alongside the usual information from clinic surveillance. However this information is limited by not having cases reported that were diagnosed and treated by other healthcare providers, particularly GPs, and also by incorrect diagnoses. A case series undertaken in Wellington in 2004–2005 showed a 20% undercount if using SHC data alone [7]. Another study in Auckland used laboratory data and identified 92 definite or probable cases from July 2006 – July 2007 [8]. This compares with the ESR sentinel STI surveillance which recorded 31 cases for 2006, and 51 cases for 2007 from Auckland SHCs, giving an average for 12 months of 41 cases [48]. Over-diagnosis of infectious syphilis was also noted in the first enhanced syphilis report when 14/83 cases reported to ESR as part of sentinel surveillance in 2011 were found not to meet the criteria for infectious syphilis [5]. Full reporting by laboratories and follow up by appropriately skilled sexual health or public health physicians to ascertain the case status, as is recommended in some other countries [43, 49], would give a more complete picture of the epidemiology of this serious disease in New Zealand.

Despite the improvements described above, there is still a critical gap in STI surveillance in New Zealand in relation to information on some risk factors and behaviours associated with a

higher burden of STIs. For example, the current system is unable to provide information on STI burden, apart from syphilis, by sexual orientation. Work with some SHCs had been started to enable this data for STIs other than syphilis to be collected and reported in the future. In addition, provision of information on the reason for attendance of FPC cases has been agreed on and the most meaningful way of analysing this was under discussion. However, due to the changes arising from the expected passage later this year of the Health Protection Amendment Bill, which will see HIV infection, gonorrhoea and syphilis become notifiable diseases, further work on these proposals has been put on hold. It may be timely to review the surveillance system for all STIs as part of the necessary planning and implementation of the changes required to support notification of the specific diseases listed in the legislation.

Summary

The STI burden in New Zealand is considerable, with young people, those of non-European ethnicities and MSM over-represented amongst bacterial STI cases. Although testing coverage rates in the highest risk age groups are notably higher across all ethnicities for females compared with males, they are below the levels that modelling has predicted are required to reduce prevalence.

In the period 2010 to 2014, decreases were observed for most of the STIs under surveillance. The most notable exceptions were gonorrhoea and syphilis. The 7.4% increase in the national estimated gonorrhea rate is likely to be due to improved detection of cases through greater NAAT testing rather than an increase in the community burden of gonorrhoea. This assumption is supported by the decrease in the national estimated rate between 2013 and 2014 when the same data processing and laboratory testing methods were used. Enhanced surveillance of infectious syphilis suggests that the 16.7% increase in cases recorded from 2010–2014 is driven by transmission amongst MSM.

Recent changes to STI surveillance have enhanced the usefulness of STI surveillance reporting. If some STIs become notifiable with passage of the Health Protection Amendment Bill currently before Parliament, it is expected that further changes to the surveillance system will strengthen this.

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APPENDICES

Appendix A: Clinic visits

Sexual health clinics

SHCs reported 80,000 clinic visits during 2014, 57.8% (46,232 visits) of which were by females. Between 2013 and 2014, the number of clinic visits decreased by 0.02% (from 80,016 visits in 2013 to 80,000 visits in 2014).

Where information for age and ethnicity was provided, 42.2% (33,772 visits) were by attendees aged less than 25 years, 60.2% (47,248 visits) were European, 22.4% (17,623 visits) were Māori, 4.5% (3558 visits) were Pacific peoples and 12.9% (10,091 visits) were of Other ethnicity.

Family planning clinics

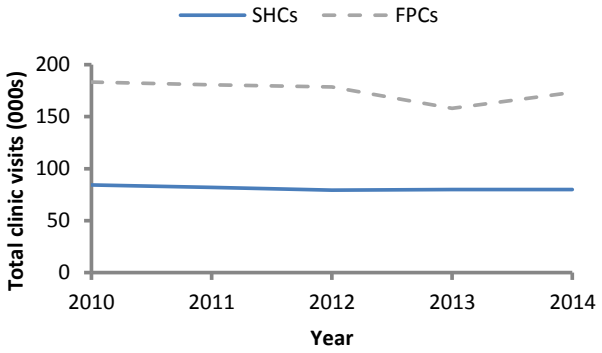
FPCs reported 173,323 clinic visits during 2014, 95.5% (165,582 visits) of which were by females. Between 2013 and 2014, the number of clinic visits increased by 9.7% (from 158,050 visits in 2013 to 173,323 visits in 2014).

Where information for age and ethnicity was provided, 58.9% (102,083 visits) were by attendees aged less than 25 years, 69.0% (115,304 visits) were European, 15.9% (26 639 visits) were Māori, 4.8% (8,065 visits) were Pacific peoples and 10.2% (17,100 visits) were of Other ethnicity.

Trends in clinic visits

Over the five–year period between 2010 and 2014 the annual numbers of clinic visits in SHCs and FPCs were stable (Figure 67).

Figure 67. Total clinic visits by clinic type, 2010–2014



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 <u>all</u> 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 <u>all</u> 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 <u>visible</u>* typical lesion(s) on internal or external genitalia, perineum, or perianal region. * Do not include persons for whom there is <u>only</u> 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).	
	Early latent syphilis cases: case must have 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 have no clinical signs or symptoms of syphilis, no previously documented reactive treponemal 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 2014 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 Southerns 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, 2010–2014

Figure 68. Laboratory surveillance coverage for chlamydia by DHB, 2010–2014

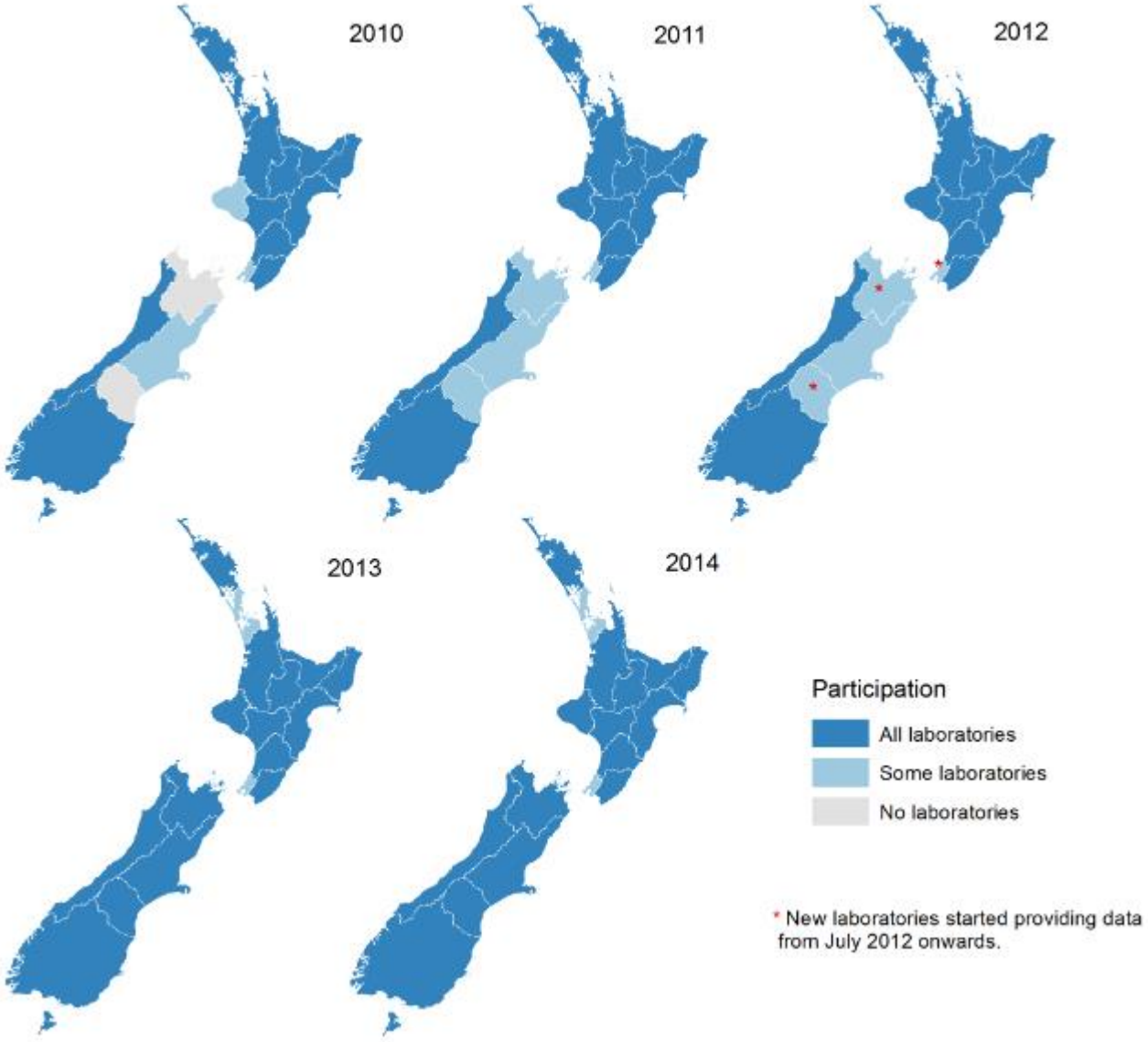
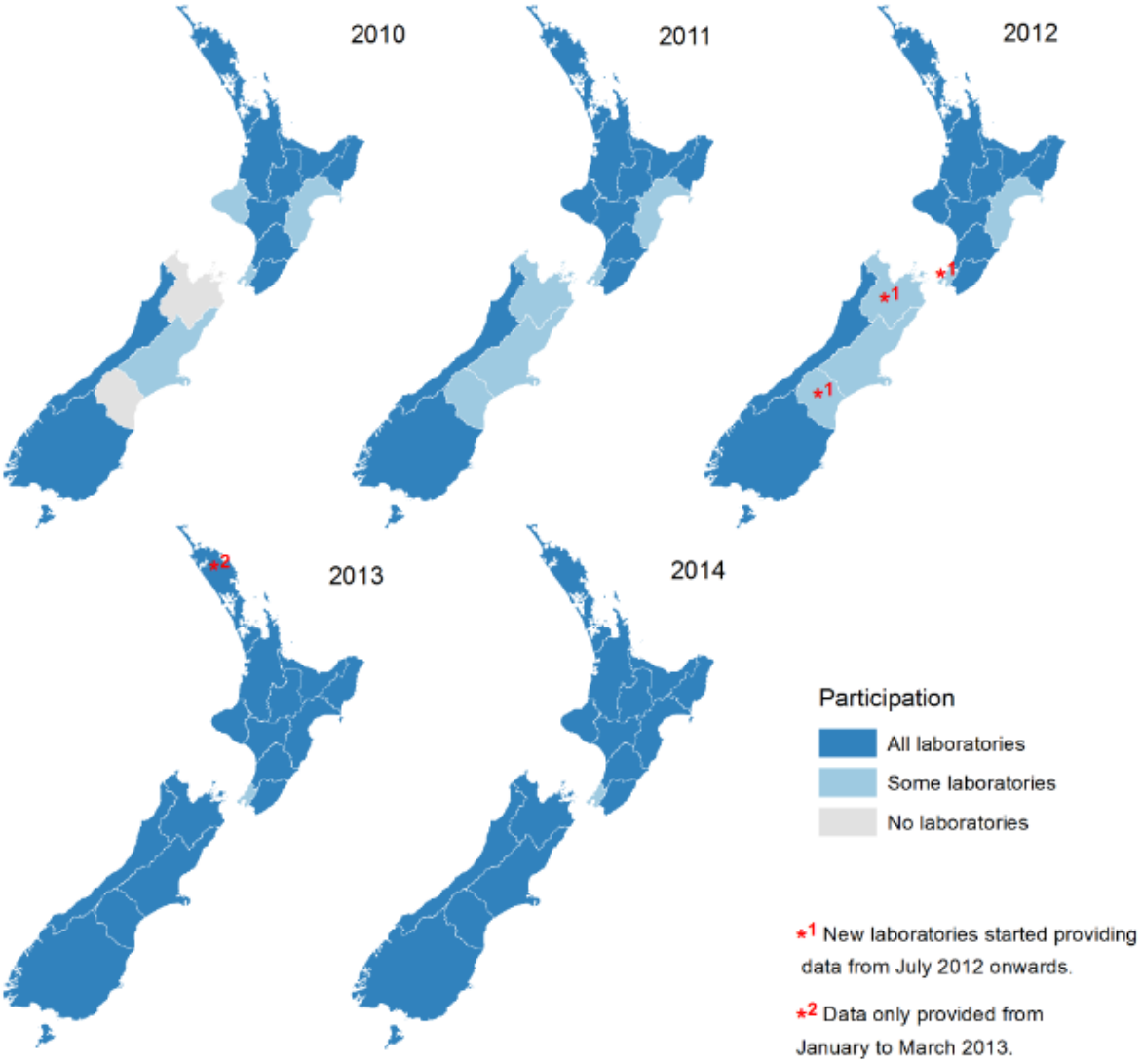


Figure 69. Laboratory surveillance coverage for gonorrhoea by DHB, 2010–2014



Appendix E: 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

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

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

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Appendix F: 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:

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E/S/R

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