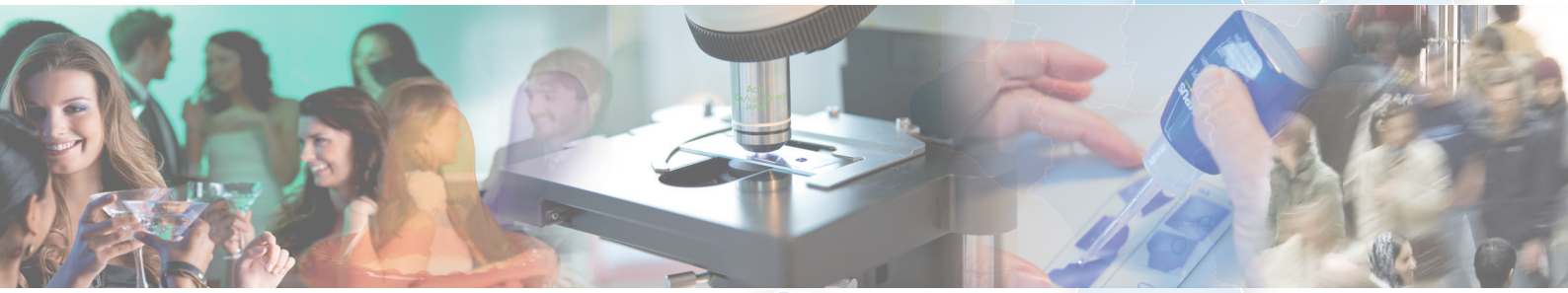
ESR

SURVEILLANCE REPORT



Sexually transmitted infections in New Zealand

2013

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

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 2013 and examines trends over time. The following STIs are reported: chlamydia, gonorrhoea, genital herpes, genital warts, 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 2013, it was estimated that laboratory surveillance reported approximately three 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, DHB rates were calculated for all DHBs (except Northland for Gonorrhoea) from laboratory surveillance data.

Chlamydia

Chlamydia was the most commonly reported STI in 2013, in both laboratory and clinic settings. A national chlamydia rate (based on all DHBs) of 633 per 100 000 population was calculated from laboratory surveillance data. Sixty-eight percent of cases reported through laboratory surveillance data in 2013 were aged between 15 and 24 years. There were 84 cases of chlamydia in infants.

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.

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.

Gonorrhoea

In 2013, a national gonorrhoea rate (based on 19 DHBs) of 78 per 100 000 population was estimated from laboratory surveillance data. Over 50% of cases reported by laboratories were aged between 15 and 24 years and two cases of gonorrhoea in infants were reported. In SHCs, over 60% of cases were from non-European ethnic groups (Māori, Pacific Peoples and Other ethnic groups). Of the 19 DHBs meeting the laboratory selection criteria for analysis in 2013, Tairawhiti DHB reported the highest gonorrhoea rate, over five times the estimated national rate.

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

Syphilis

The number of cases of syphilis reported by SHCs remained stable between 2012 and 2013 (80 cases). Three cases were reported by FPCs. The SHC cases were predominantly male (92.5%) and occurred most commonly in the 40 years and over age group. Sixty percent of the cases were from the European ethnic group, 20.5% from the Other ethnic group, 11.0% from the Pacific Peoples ethnic group and 8.2% from the Māori ethnic group. Syphilis cases were predominantly reported from clinics in the Auckland region and Canterbury DHB.

Other STIs

From 2012 to 2013, SHCs reported an increase in case counts of genital herpes and NSU (by 3.0% and 15.2% respectively) and a decrease in case counts of genital warts (16.8%). The five-year trend from 2009 to 2013 showed a decrease in genital herpes and genital warts (2.2% and 43.7% respectively) and an increase in NSU (2.3%).

No cases of chancroid, GI and lymphogranuloma venereum were reported in 2013.

INTRODUCTION

ABOUT THIS REPORT

The *Sexually transmitted infections in New Zealand: Annual Surveillance Report* summarises the epidemiology of STIs in 2013, 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. The clinic surveillance data reported this year, as for 2012, is restricted to data from sexual health and family planning clinics. STI data collection has been improved by the implementation of a secure Sharepoint portal website. New data provided includes National Health Index (NHI) number, date of birth (DOB), all tests (positive and negative), and the type of test performed. This has allowed new analyses in this year's report; the additions include test positivity and population testing rates for chlamydia and gonorrhoea by age and sex. Gonococcal antimicrobial susceptibility testing data is now received directly by ESR from the laboratories. Surveillance methods and notes for interpreting the results can be found in the appendices of this report.

ESR is continuing work with laboratories, Family Planning Clinics (FPCs) and Sexual Health Clinics (SHCs) to further enhance STI surveillance. Use of the NHI number allows the retrieval of ethnicity information from the Ministry of Health and future reports will incorporate analysis using this data. Information from FPCs on indications for STI testing is now being collected, which will allow estimates of STI prevalence in certain population groups to be calculated. Provision of information, such as sex of partner to improve information about STIs in men having sex with men (MSM), is under discussion with SHCs. All surveillance enhancements are being introduced with the highest respect for patient privacy.

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.

SURVEILLANCE METHODS

SURVEILLANCE METHODS

Interpreting the results

Diagnostic test changes

Nucleic acid amplification tests (NAAT) have been the standard method for testing for chlamydia in New Zealand for some time. Only the longest chlamydia trends, those from 1998 onwards, will be influenced by the introduction of NAAT testing.

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

These tests 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 started to use 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 2009 to 2013, 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 for 2009 to 2013 are included if a clinic met the 10 out of 12 month inclusion criteria for 2013; the completeness of a clinic's data over the previous four years is not considered. Therefore, 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 Analysis methods). The New Zealand rates reported from 2009 to 2013 were calculated using a set of DHBs who had complete data for 2009 to 2012 and all DHBs (except Northland for gonorrhoea) in 2013. 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 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
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 G.
[b] Only Tairawhiti has performed NAAT testing since 2012 and other areas have introduced NAAT more recently
[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.

Clinic-based surveillance

Sexual health clinics 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 and student and youth health clinics, 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.

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. In 1998, 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 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 D). Although surveillance via SYHCs was discontinued in 2012, FPCs provided additional data in 2013. 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, a group with a higher burden of STIs, is under discussion with some SHCs. Changes to laboratory-based surveillance are described in the following section.

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 (see Appendix H: 2013 participation map).

During 2013, ESR worked with laboratories on further measures to enhance the surveillance of STIs. ESR collected data elements that allowed the ethnicity of those having STI tests to be determined. However, the ethnicity data is not presented in this report due to time constraints as more work is required to determine how the data will be processed and presented. Ethnicity information is particularly important to document and monitor the higher burden of STIs indicated in Māori and Pacific populations. The work carried out with laboratories also extended surveillance to all specimens tested for most laboratories, enabling testing and positivity rates in different population groups to be established.

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 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.

The new data provided included National Health Index (NHI) number, date of birth (DOB), all tests (positive and negative), and type of test performed. The NHI numbers are stored on the Sharepoint portal website and are used to retrieve ethnicity information from the Ministry of Health. This year's report does not include ethnicity information for lab specimens as the best way to analyse this data is still under discussion. Laboratories only report specimens received directly from health care settings. The diagnostic tests used by each laboratory may differ.

In previous years 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 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) and Medlab Taranaki did not provide data in the new format for a full year in 2013.

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 E). 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 onto the national STI surveillance database by ESR staff or entered onto 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.

Table 3. STIs under clinic-based surveillance

Infection	Category or criteria	Site (for confirmed infections)
Chlamydia	Confirmed or probable (1^{st} diagnosis per month)	Uncomplicated lower anogenital, PID/epididymitis, other site
Gonorrhoea	Confirmed or probable (1^{st} diagnosis per month)	Uncomplicated urogenital or anorectal, PID/epididymitis, pharynx, other site
Genital warts	1^{st} diagnosis at reporting clinic	
Genital herpes	1^{st} 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	

Analysis methods

All results and analyses are based on data submitted prior to 15 March 2014. 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 [4].

STI case numbers

The STIs under clinic-based surveillance include both probable and confirmed case definitions for chlamydia, gonorrhoea, chancroid, GI and LGV. However, case numbers presented in this report relate to confirmed cases of these diseases only (unless otherwise stated). 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 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 reported cases for chlamydia and gonorrhoea. Testing rates: the total number of tests in each DHB for chlamydia and gonorrhoea.

Denominator data

Laboratory rates: the denominator for the calculation of rates is the mid-year population estimate published by Statistics New Zealand.

Statistical tests

The method used to calculate the confidence intervals for the estimated national rates of chlamydia and gonorrhoea in 2013 and the five-year estimated national rates trend analyses adjusts for the fact that we have data from most, but not all DHBs [5]. 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 varied over time, reporting periods were selected to provide the longest period of time for a relatively stable set of laboratories or clinics.

A five-year period (2009–2013) was reported for laboratory surveillance trends and clinic trends, except for the long term trend analyses where a 16-year period (1998–2013) was 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. 2013 analysis: each laboratory in the DHB must have provided data for all 12 months of 2013. Age group and sex analysis for test positivity excluded Taranaki DHB as their data was not collected in the new format. 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 (October to December 2013). The estimation was carried out by multiplying the quarter provided by three.
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. In 2013 all DHBs provided data (except for Northland for Gonorrhoea) and were included in this analysis in addition to the DHBs with data available up until 2012.
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 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 analysis.

The following DHBs have been combined for reporting purposes: Auckland, Waitemata and Counties Manukau DHBs (Labtests), and Hutt Valley and Capital & Coast DHBs (Aotea Pathology).

Table 4 summarises which DHBs met the inclusion criteria for the various analyses.

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 2013		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.
[d] Full year of data provided in 2013 only.
✓ = Selected × = Excluded

Laboratory and clinic participation and data completeness

Clinics

In 2013, 27 SHCs and 32 FPCs across New Zealand voluntarily participated in the STI surveillance programme. 95% (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.

Laboratories

In 2013, 43 laboratories across all DHBs in New Zealand voluntarily participated in the STI surveillance programme. Of these, 42 laboratories provided chlamydia data and 42 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 (Analysis methods).

CHLAMYDIA

CHLAMYDIA

Key findings

- In 2013, the national chlamydia rate was 633 cases per 100 000 population, a decrease from 744 cases per 100 000 population in 2012.
- There were more than twice the number of female than male laboratory-diagnosed cases of chlamydia in 2013.
- 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 2009.
- Lakes and Tairawhiti DHBs have consistently had the highest chlamydia rates.
- Chlamydia is predominantly diagnosed from urine samples in men and cervical samples in women.
- 84 cases of laboratory-diagnosed chlamydia were reported in the less than one year age group.

In 2013, genital chlamydia infection was the most commonly reported STI in New Zealand. Chlamydia infection is asymptomatic in approximately 25% of male cases and 70% of female cases [6]. 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 [7].

Laboratory surveillance of chlamydia

National and DHB analysis

Annual 2013 analysis

In 2013, 42 laboratories provided chlamydia data. All DHBs met the selection criteria for chlamydia reporting (Analysis methods). Laboratories in these DHBs reported positive tests from 28 316 patients. The national chlamydia rate was 633 per 100 000 population (see Analysis methods re new data processing methods introduced in 2013 that allowed for exclusion of repeat tests).

The highest number of laboratory-confirmed chlamydia cases was seen in the Auckland region (9793 cases) and in Waikato DHB (2633 cases) (Table 5). The highest rate of chlamydia was reported in Tairawhiti DHB (1465 per 100 000, 684 cases), followed by Lakes (1217 per 100 000, 1253 cases) and Hawke's Bay (850 per 100 000, 1321 cases) DHBs.

Table 5. Number of laboratory-confirmed chlamydia cases and population rates by DHB, 2013

District Health Board	Number of laboratory-confirmed cases	Rate per 100 000 population
Northland	774	488
Auckland region[a]	9793	634
Waikato	2633	706
Lakes	1253	1217
Bay of Plenty	1480	695
Tairawhiti	684	1465
Taranaki	563	509
Hawke's Bay	1321	850
Whanganui	404	647
MidCentral	1044	615
Wellington region[b]	2613	589
Wairarapa	224	551
Nelson Marlborough	647	458
West Coast	150	459
Canterbury	2601	513
South Canterbury	272	477
Southern	1860	600
Total	**28 316**	**633**

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

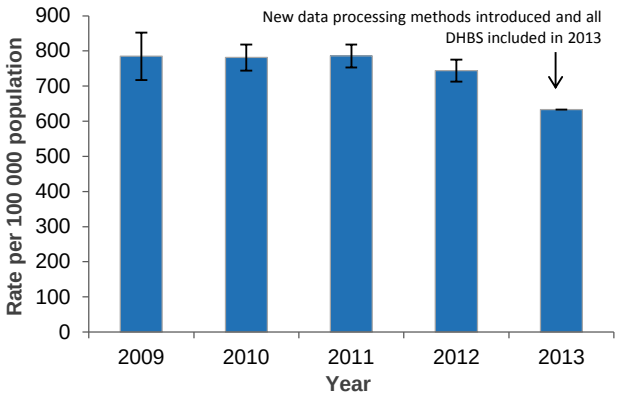
Trends in laboratory diagnoses

1. National rate trend analysis

All DHBs where data was available were included in the national rate trend analysis for chlamydia (Analysis methods). The 2013 national rate (633 per 100 000 population) was lower than the 2012 estimate (744 per 100 000 population) and the estimate for 2009 (785 per 100 000 population). The estimated national rates from 2009 to 2012 (with a 95% confidence interval indicated) and the 2013 national rate are shown in Figure 1.

The comparison of 2013 national and DHB rates with the 2009-2012 estimated rates should be interpreted with caution due to the introduction of a process to exclude repeat tests for an individual and the addition of DHBs that were not previously reporting. Overall, 5.8% (1747) of positive specimens were excluded as they were considered to be repeat tests. To directly compare 2013 data with previous years, an annual rate was estimated for 2013 using only the 15 DHBs that contributed data from 2009–2012 and including repeat tests for 2013. The estimated rate for 2013 (714 per 100 000) was lower than the 2012 estimate (744 per 100 000) and the estimates for 2009–2011 (781–786 per 100 000).

Figure 1. National chlamydia rate, 2009–2013

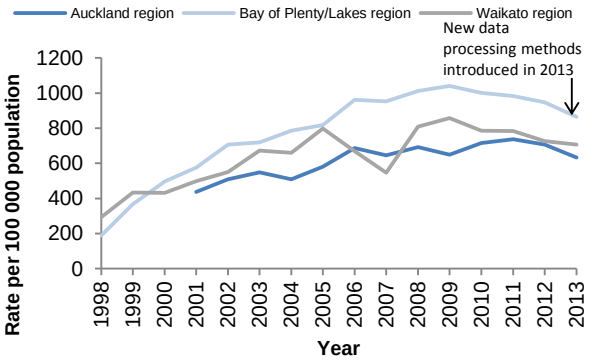


Note: Estimated rates were calculated for 2009–2012 with 95% CI's based on data from 15 DHBs.
New data processing methods allow for exclusion of repeat tests within a defined period (see Analysis methods).

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). There was a generally increasing chlamydia rate across these regions. The rate increase plateaued in 2005 and has decreased in the Bay of Plenty and Lakes regions since 2011.

Figure 2. Chlamydia rates in selected regions, 1998–2013

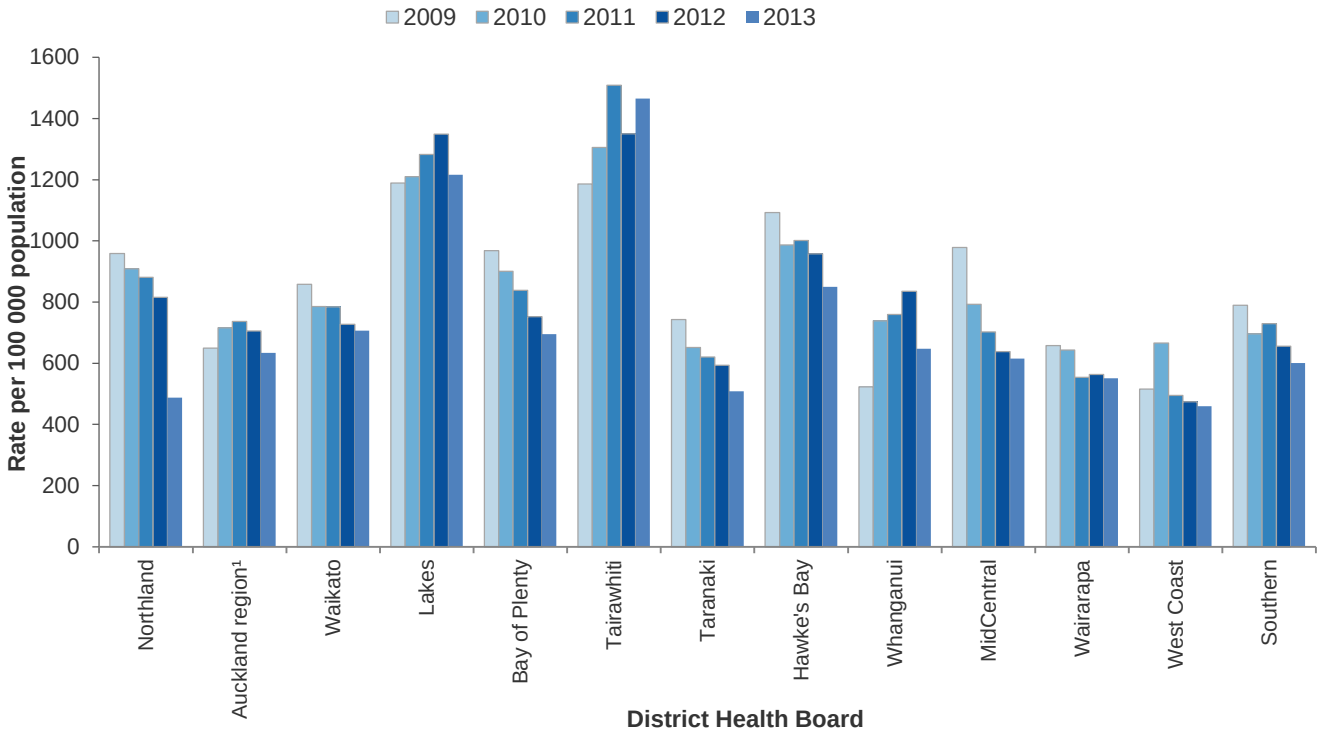


Note: Auckland region is comprised of Waitemata, Auckland and Counties Manukau DHBs.

3. Individual DHB trend analysis

Fifteen DHBs met the selection criteria for the individual DHB trend analysis. From 2009 to 2013, the chlamydia rate varied among DHBs and across years (Figure 3). Notable trends over this period are that Lakes, Tairawhiti and Whanganui DHBs experienced high and generally increasing rates, while other DHBs generally had decreasing rates across the time period.

Figure 3. Chlamydia rates by DHB, 2009–2013



[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 Analysis methods).

Age and sex distribution of laboratory-confirmed cases

2013 analysis

Age and sex information was recorded for 99.1% (28 078/28 316) and 99.7% (28 231/28 316) of laboratory-confirmed chlamydia cases respectively. The national rate for females (888 per 100 000 population, 20 156 cases) was more than twice the national rate for males (367 per 100 000 population, 8075 cases) (Table 6).

The highest rate of chlamydia in males was reported for Tairawhiti DHB (786 per 100 000, 180 cases), followed by Lakes (579 per 100 000, 297 cases) and Hawke's Bay (420 per 100 000, 316 cases) DHBs. The highest rate of chlamydia cases in females was reported for Tairawhiti DHB (2107 per 100 000, 503 cases), followed by Lakes (1803 per 100 000, 955 cases) and Hawke's Bay (1260 per 100 000, 1004 cases) DHBs.

The mean age of laboratory-confirmed chlamydia cases was 23.0 years (median age 21 years, range 0–79 years). Sixty-eight percent (19 327) of positive cases were aged 15–24 years. The highest national age-specific rate of laboratory-confirmed chlamydia for males occurred in the 20–24 years age group (1674 per 100 000 population, 2908 cases). For females, the highest national age-specific rate of laboratory-confirmed chlamydia occurred in the 15–19 years age group (5064 per 100 000 population, 7529 cases). The highest DHB age-specific rate was in the 15–19 years age group from Tairawhiti DHB (8618 per 100 000 population, 290 cases). Table 7 presents the number of laboratory-confirmed chlamydia cases, and chlamydia population rates by DHB and age group for 2013.

Eighty-four laboratory-confirmed chlamydia cases were reported in the less than one year age group. Estimated population data was not available to calculate age-specific rates by DHB for this age group.

Table 6. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB and sex, 2013

District Health Board	Number of laboratory-confirmed cases				Rate per 100 000 population		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	167	605	2	774	214	750	488
Auckland region[a]	2990	6798	5	9793	393	866	634
Waikato	740	1892	1	2633	402	1002	706
Lakes	297	955	1	1253	579	1803	1217
Bay of Plenty	362	1094	24	1480	349	1001	695
Tairawhiti	180	503	1	684	786	2107	1465
Taranaki	145	417	1	563	265	743	509
Hawke's Bay	316	1004	1	1321	420	1260	850
Whanganui	100	304	0	404	333	981	647
MidCentral	303	740	1	1044	365	852	615
Wellington region[b]	774	1821	18	2613	357	803	589
Wairarapa	49	175	0	224	247	842	551
Nelson Marlborough	182	465	0	647	261	651	458
West Coast	39	108	3	150	235	674	459
Canterbury	827	1770	4	2601	328	694	513
South Canterbury	58	199	15	272	206	688	477
Southern	546	1306	8	1860	356	836	600
Total	**8075**	**20 156**	**85**	**28 316**	**367**	**888**	**633**

[a] Waitemata, Auckland and Counties Manukau DHBs.

[b] Hutt Valley and Capital & Coast DHBs.

Table 7. Number of laboratory-confirmed chlamydia cases and chlamydia rates by DHB and age group, 2013

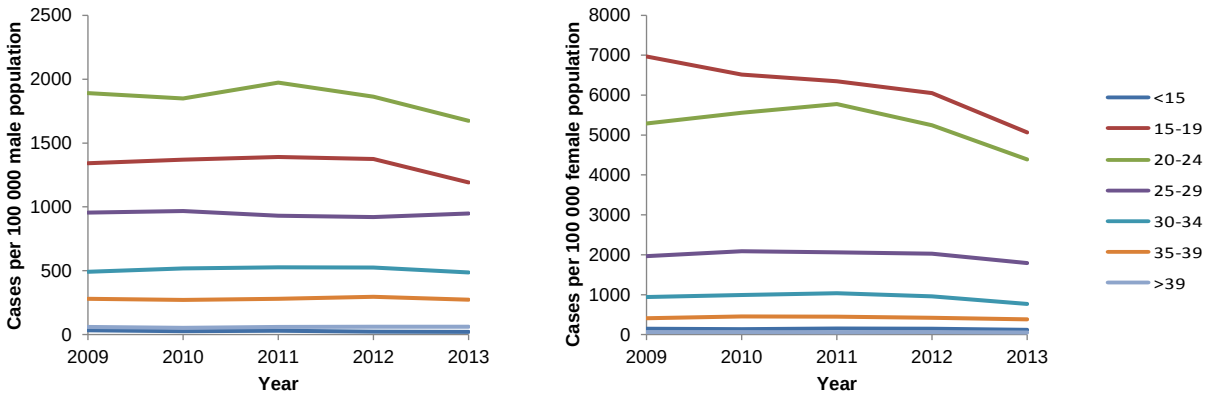
District Health Board	Age group (years)[c]																					
	0–4		5–9		10–14		15–19		20–24		25–29		30–34		35–39		40+		Unknown		Total	
	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000
Northland	4	-	0	-	35	309	338	3299	230	2561	89	1121	45	651	17	214	16	19	0	–	774	488
Auckland region[a]	45	40	3	-	126	127	2748	2537	3423	2793	1704	1371	790	680	393	380	559	85	2	–	9793	634
Waikato	10	36	0	-	62	244	964	3608	937	3348	356	1534	147	657	74	349	83	48	0	–	2633	706
Lakes	2	-	0	-	46	605	584	8179	358	5222	130	2124	57	982	35	567	41	84	0	–	1253	1217
Bay of Plenty	3	-	0	-	46	314	594	4348	459	3646	218	2036	67	614	31	271	40	36	22	–	1480	695
Tairawhiti	2	-	0	-	33	899	290	8618	203	6711	87	3135	33	1392	16	623	20	94	0	–	684	1465
Taranaki	1	-	0	-	8	110	164	2318	170	2478	52	794	17	269	7	114	13	24	131	–	563	509
Hawke's Bay	1	-	0	-	54	494	575	5376	390	4223	154	1887	62	801	40	462	44	57	1	–	1321	850
Whanganui	0	-	0	-	3	-	157	3725	109	2695	44	1308	18	626	10	327	8	26	55	–	404	647
MidCentral	2	-	0	-	9	82	398	3152	389	2700	144	1360	56	588	20	221	21	26	5	–	1044	615
Wellington region[b]	7	24	0	-	42	157	700	2406	1042	2886	407	1166	177	548	93	308	141	72	4	□	2613	589
Wairarapa	1	-	0	-	4	-	112	4628	72	3165	14	816	6	317	10	491	5	22	0	–	224	551
Nelson Marlborough	1	-	0	-	5	57	258	3118	216	2748	93	1306	36	516	14	179	24	31	0	□	647	458
West Coast	0	-	0	-	2	-	61	3177	60	3150	18	1094	7	420	0	0	2	11	0	–	150	459
Canterbury	3	-	1	-	42	143	823	2363	1016	2625	352	1066	166	536	80	257	115	46	3	□	2601	513
South Canterbury	0	-	0	-	2	-	96	2759	89	2689	37	1388	17	653	11	375	10	32	10	□	272	477
Southern	5	27	0	-	15	86	559	2565	788	2906	275	1329	111	591	53	296	49	33	5	–	1860	600
Total	**87**[d]	**28**	**4**	**-**	**534**	**187**	**9421**	**3080**	**9951**	**2981**	**4174**	**1366**	**1812**	**633**	**904**	**331**	**1191**	**57**	**238**	**–**	**28 316**	**633**

[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 84 cases under one year old.

Trends in age and sex distribution of chlamydia

Between 2009 and 2013, the overall distribution of laboratory-confirmed chlamydia cases by age and sex remained relatively stable, apart from a steady decrease in the rate for females in the 15–19 years and the 20–24 years age groups (a 27% decrease and a 17% decrease, respectively). Chlamydia rates by age group and sex from 2009 to 2013 are presented in Figure 4.

Figure 4. Chlamydia rates per 100 000 population by age group and sex, 2009–2013



Note: Estimated rates were calculated for 2009–2012 based on data from 15 DHBs. All DHBs were included in 2013.
New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Analysis methods).

Test positivity and population testing rates

2013 analysis

42 laboratories from all DHBs tested 388 472 specimens for chlamydia, from that 7.8% (30 346 specimens) from 28 316 cases tested positive. The population testing rate was 87 chlamydia tests per 1000 population. The specimen counts did not exclude repeat samples from the same individual.

Table 8 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 DHB for 2013.

The highest population testing rates were in Lakes (112 per 1000 population), and Tairawhiti (100 per 1000 population) DHBs, followed by the Auckland region (98 per 1000 population) and the Wellington region (93 per 1000 population).

Tairawhiti DHB had the highest percentage of positive tests for chlamydia (15.3%), followed by Hawke's Bay (11.9%) and Lakes (11.4%) DHBs. The Wellington region and Canterbury DHB had the lowest percentages of positive tests (both 6.8%).

Table 9 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 2013.

The highest population testing rate was reported in the 20–24 years age group for both males and females (105 per 1000 population and 508 per 1000 population, respectively). Males in the 15–19 years and 20–24 years age groups had the highest percentage of positive specimens (20.1% and 16.6%, respectively). Females in the 10–14 years and 15–19 years age groups had the highest percentage of positive specimens (15.9% and 15.4%, respectively).

Table 8. 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, 2013

District Health Board	Total specimens	Tests per 1000 population	Specimens tested positive (%)[a]	Number of laboratory-confirmed cases[b]
Northland	9060	57	9.0	774
Auckland region[c]	150 881	98	7.0	9793
Waikato	30 214	81	9.1	2633
Lakes	11 549	112	11.4	1253
Bay of Plenty	16 904	79	9.1	1480
Tairawhiti	4651	100	15.3	684
Taranaki	9099	82	7.4	563
Hawke's Bay	12 189	78	11.9	1321
Whanganui	3978	64	10.8	404
MidCentral	11 426	67	9.5	1044
Wellington region[d]	41 258	93	6.8	2613
Wairarapa	2356	58	10.3	224
Nelson Marlborough	9219	65	7.4	647
West Coast	2190	67	7.0	150
Canterbury	41 825	82	6.8	2601
South Canterbury	3174	56	9.3	272
Southern	28 499	92	6.9	1860
Total	**388 472**	**87**	**7.8**	**28 316**

[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 9. 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, 2013

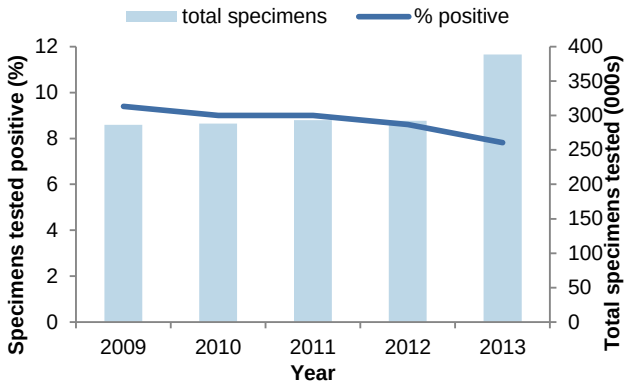
Age Group (years)	Total specimens[a]			Tests per 1000 population[a]			Specimens tested positive (%)[a,b]			Number of laboratory-confirmed cases[a,c]		
	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]	Male	Female	Total[d]
0–4	847	837	1692	6	6	6	5.2	7.2	6.1	38	48	86
5–9	42	156	198	0	1	1	2.4	0.6	1.0	1	3	4
10–14	419	3243	3667	3	24	13	15.0	15.9	15.8	54	471	526
15–19	9535	51 612	61 235	62	355	205	20.1	15.4	16.2	1851	7387	9257
20–24	17 786	79 627	97 522	105	508	298	16.6	9.2	10.5	2880	6888	9781
25–29	12 534	51 225	63 824	83	346	214	12.4	5.5	6.9	1455	2665	4122
30–34	7808	38 146	46 007	57	266	164	9.1	3.1	4.1	673	1116	1795
35–39	5758	27 970	33 756	45	200	126	6.4	2.0	2.8	358	538	897
40+	14 894	54 160	69 135	15	51	34	4.4	1.2	1.9	598	580	1178
Unknown	192	316	763	-	-	-	13.0	15.5	16.0	22	43	107
Total[e]	**69 815**	**307 292**	**377 799**	**33**	**139**	**87**	**11.9**	**6.9**	**7.8**	**7930**	**19 739**	**27 753**

[a] All counts, rates or percentages exclude Taranaki DHB.
[b] Calculated using the number of positive specimens (includes repeat tests).
[c] Excludes repeat tests.
[d] Includes unknown sex.
[e] Estimated counts for the first three quarters of 2013 for one laboratory in the Auckland region (LabPlus) have been included, as counts in the new format were only provided for the last quarter of 2013 (Analysis methods).

Trends in test positivity

All DHBs where data was available have been included in the trend analysis of test positivity rates (Figure 5). Between 2009 and 2013, the percentage of positive results recorded for all specimens tested for chlamydia decreased from 9.4% to 7.8%. With the inclusion of new DHBs in 2013 there has been a large increase in the number of tests included in this analysis.

Figure 5. Percentage of positive specimens tested and total specimens tested for chlamydia, 2009–2013



Note: All DHBs were included in 2013.

Specimen site

2013 analysis

The site from which the specimen was taken was recorded for 99.4% (27 497/27 665 specimens) of positive specimens, based on chlamydia data from 40 laboratories. In males, the most common specimen site was urine (83.6%, 6159/7369 positive specimens). In females, the most common specimen site was the cervix (57.5%, 11 603/20 164 positive specimens). (Table 10). The number of positive specimens from non-urogenital sites remains comparatively low (619/20 164 3.1% for females and 181/7369 2.5% for males,). A total of 132 positive specimens were from the eye and of these 82 (62.1%) were from patients aged less than one year.

Trends in specimen site

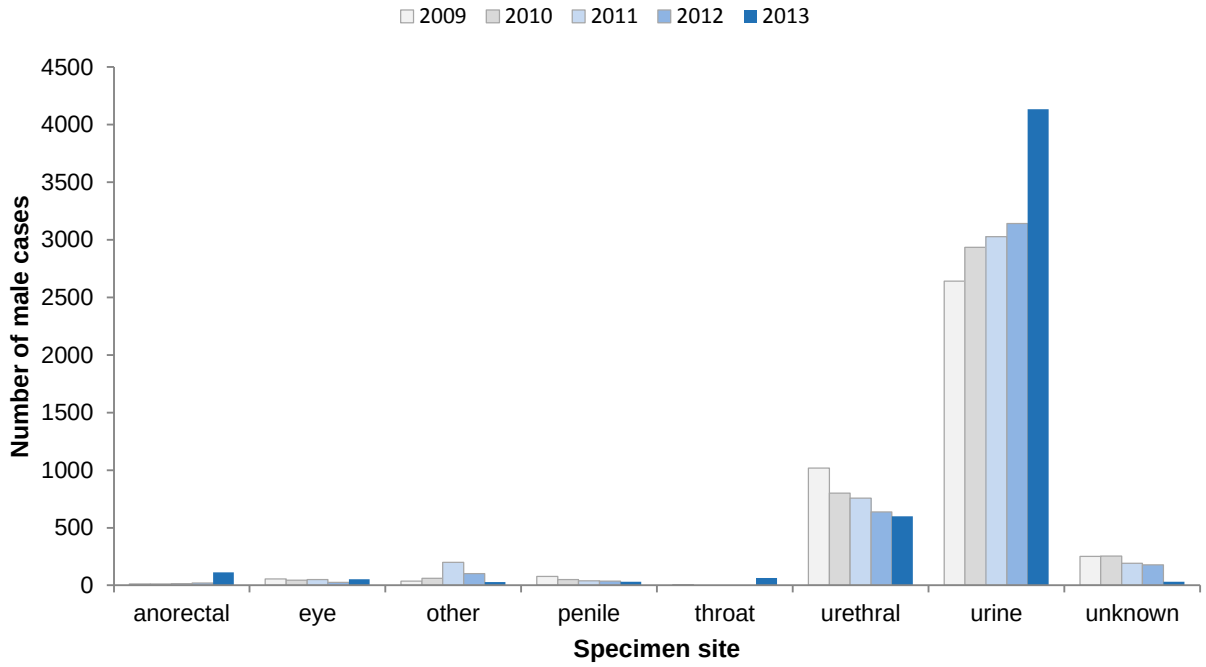
Figure 6 and Figure 7 present the specimen site of positive chlamydia tests and the trends based on data reported by 30 laboratories between 2009 and 2013 for males and females (Analysis methods). In males, there was a decrease in the number of positive specimens from urethral and penile sites and an increase in positive results from urine samples. In females, there was also a decline in positive results from urethral sites but cervical and urine sites also declined over this period. In contrast, there was an increase in the diagnosis of chlamydia from vaginal samples.

Table 10. Percentage of positive chlamydia tests by specimen site and sex, 2013

Specimen site[a]	Sex	
	Male (%)	Female (%)
Urethral	11.5	1.1
Vaginal	-	25.4
Cervix	-	57.5
Penile	0.5	-
Anorectal	2.0	0.2
Eye	0.9	0.3
Urine	83.6	12.0
Urogenital[b]	0.0	0.1
Throat	1.0	0.1
Other	0.5	2.6

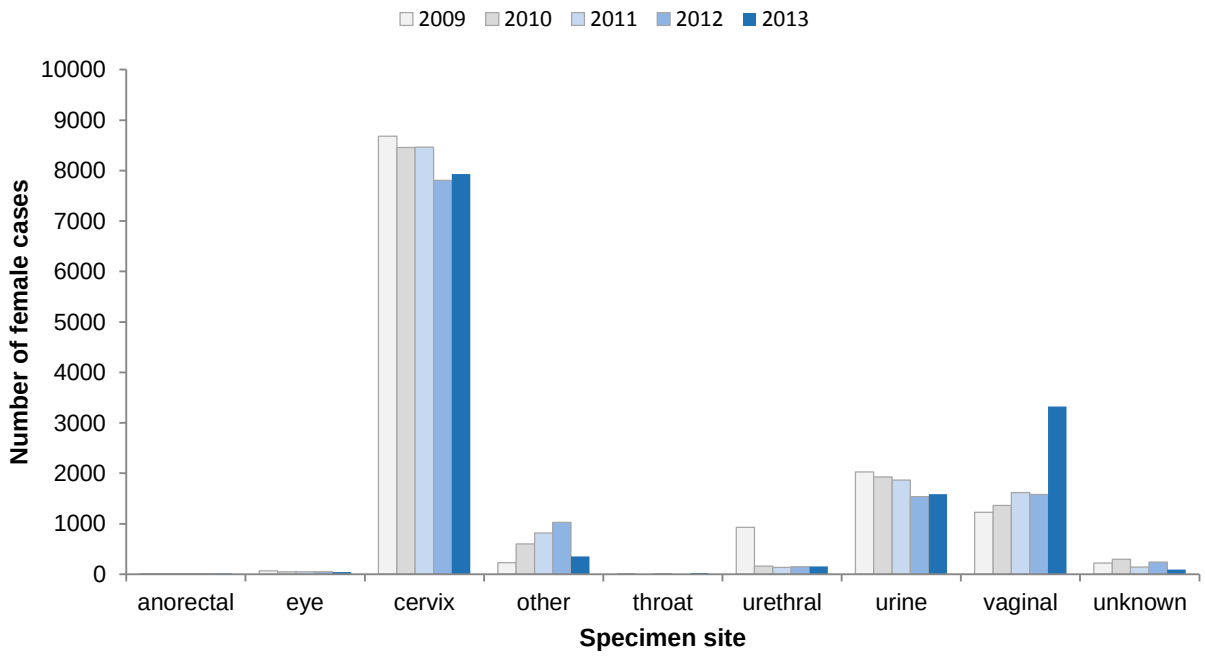
[a] Includes data from 40 laboratories.
[b] Pooled specimens from more than one site.

Figure 6. Specimen site, all positive chlamydia tests in males, 2009–2013



Note: Includes data from 30 laboratories.

Figure 7. Specimen site, all positive chlamydia tests in females, 2009–2013



Note: Includes data from 30 laboratories.

Clinic surveillance of chlamydia

National analysis

2013 analysis

In 2013, the number of chlamydia cases reported by SHCs and FPCs were 4987 and 2745 cases respectively (Table 11).

Table 11. Chlamydia case numbers by clinic type, 2013

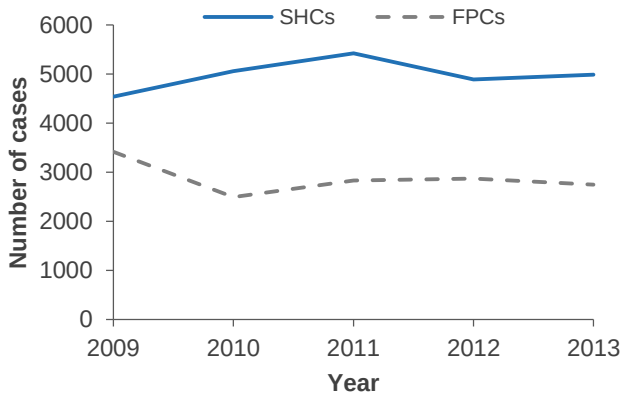
Clinic type	Total number of cases
SHC	4987
FPC	2745
Total	**7732**

Trends in national totals

Between 2012 and 2013, chlamydia clinic case numbers reported by SHCs increased by 2.1% (from 4884 to 4987 cases). By contrast, chlamydia clinic case numbers reported by FPCs decreased by 4.3% (from 2867 to 2745 cases).

From 2009 to 2013, chlamydia case numbers reported by SHCs increased by 9.9% (from 4536 to 4987) (Figure 8). By contrast, the number of chlamydia cases reported by FPCs decreased by 19.5% (from 3412 to 2745 cases) from 2009 to 2013.

Figure 8. Chlamydia cases numbers by clinic type, 2009–2013



DHB counts

2013 analysis

Clinics in 19 DHBs contributed to chlamydia surveillance in 2013. The numbers of chlamydia cases in each clinic type by DHB are presented in Table 12. The highest case numbers of chlamydia in SHCs were seen in the Auckland region (1619 cases) and in Bay of Plenty DHB (669 cases).

Table 12. Chlamydia case numbers by clinic type and DHB, 2013

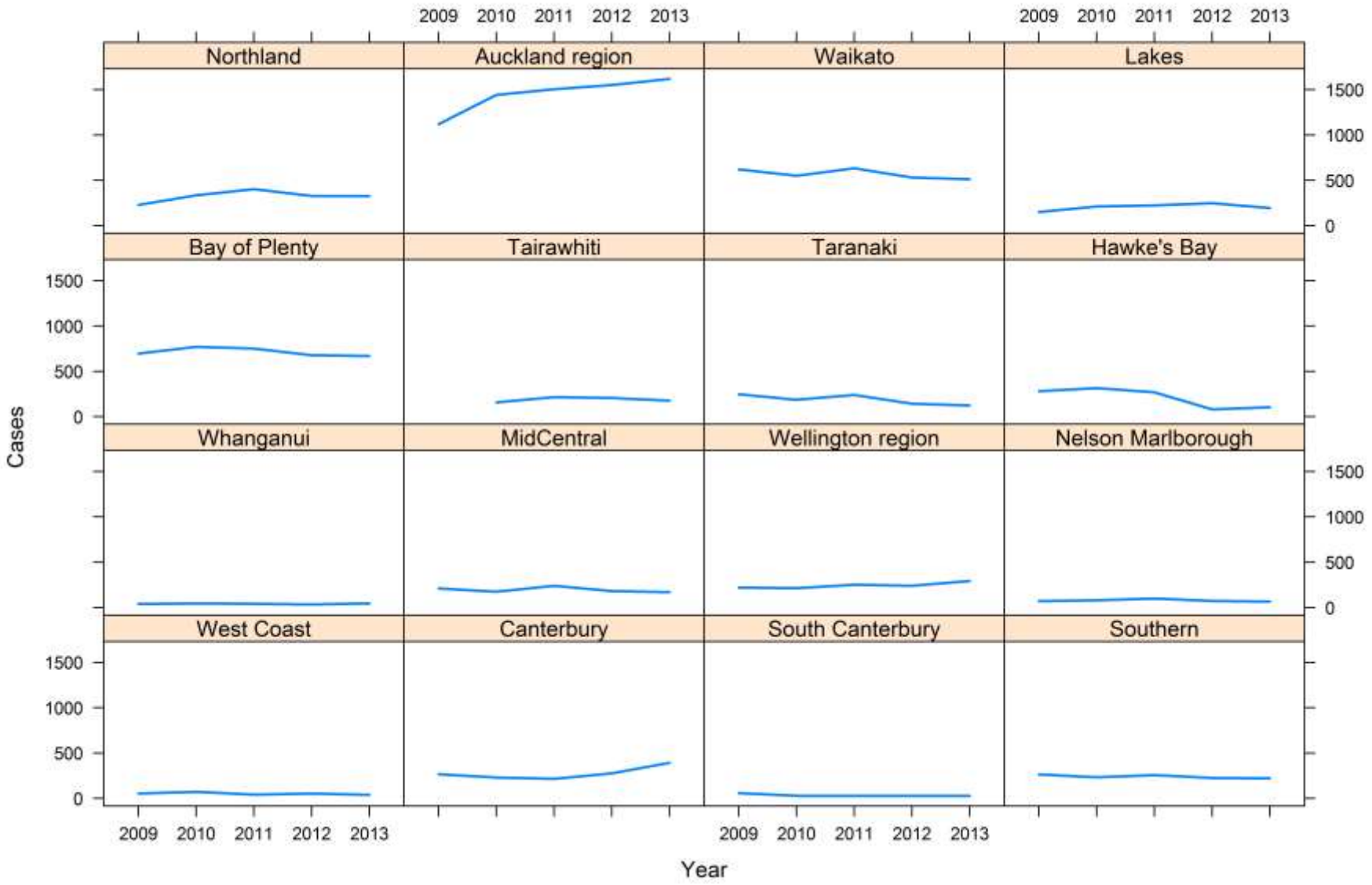
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	326	123	449
Auckland region[a]	1619	794	2413
Waikato	514	445	959
Lakes	197	0	197
Bay of Plenty	669	66	735
Tairawhiti	177	140	317
Taranaki	124	98	222
Hawke's Bay	105	0	105
Whanganui	46	50	96
MidCentral	169	0	169
Wellington region[b]	293	367	660
Nelson Marlborough	65	240	305
West Coast	40	18	58
Canterbury	393	224	617
South Canterbury	28	20	48
Southern	222	160	382

[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 2009 to 2013 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 Auckland region and decreasing case numbers in Taranaki and Hawke's Bay DHBs.

Figure 9. Chlamydia case numbers in SHCs by DHB, 2009–2013



* Data was not available for Tairawhiti DHB for 2009.

Sex, age and ethnicity distribution of chlamydia cases

2013 analysis

Sex was recorded for 99.9% (7725/7732) of chlamydia cases in 2013. More cases of chlamydia were seen 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 2013, the male to female ratio of attendees at FPCs was 1:24). Table 13 presents the number of cases of chlamydia by sex and clinic type for 2013.

Table 13. Number of cases of chlamydia by sex and clinic type, 2013

Sex	Clinic type	
	SHC	FPC
Male	2433	443
Female	2550	2299
Total	**4987**	**2745**

Age was recorded for all chlamydia cases except two in 2013. A large proportion of the reported cases of chlamydia were aged less than 25 years: 62.7% (3124/4985) in SHCs and 83.3% (2286/2745) in FPCs. The mean age of chlamydia cases was 24.6 years in SHCs and 20.8 years in FPCs.

The number of males with chlamydia was highest in the 20–24 years age group across both clinic types – 798 cases (32.8%) in SHCs and 183 cases (41.3%) in FPCs. For females, chlamydia case numbers were highest in the 15–19 years age group across both clinic types 959 cases (37.6%) in SHCs and 1119 cases (48.7%) in FPCs. Figure 10 and Figure 11 present the clinic visit counts by age group and sex reported by SHCs and FPCs in 2013.

Figure 10. Confirmed chlamydia cases reported by SHCs by age group and sex, 2013

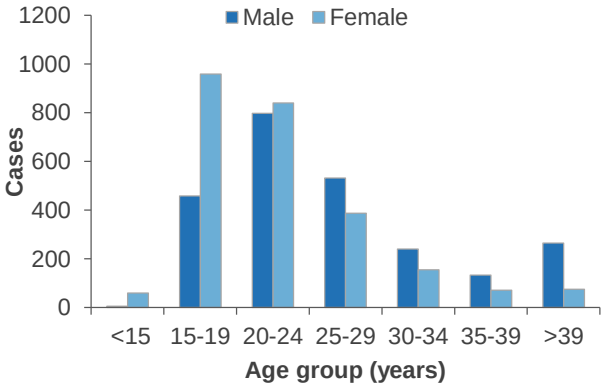
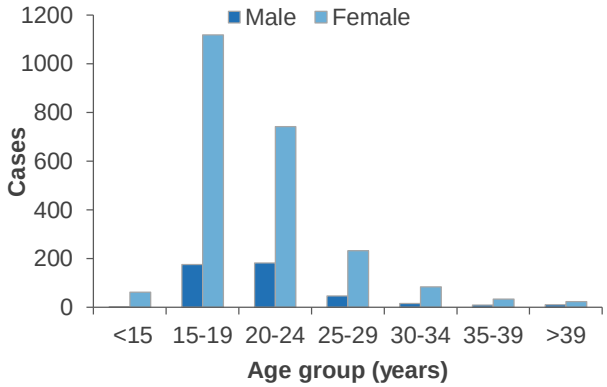


Figure 11. Confirmed chlamydia cases reported by FPCs by age group and sex, 2013



Ethnicity was recorded by SHCs for 98.8% (4926/4987) of the reported chlamydia cases (Table 14). The highest percentage of chlamydia cases reported by SHCs were of European ethnicity (44.5%, 2193 cases), followed by Māori (37.3%, 1838 cases), Pacific Peoples (10.2%, 502 cases) and Other (8.0%, 393 cases) ethnicity. Ethnicity was recorded by FPCs for 96.0% (2634/2745) of the reported chlamydia cases. The highest percentage of chlamydia cases reported by FPCs were of European ethnicity (48.5%, 1277 cases), followed by Māori (37.0%, 974 cases), Pacific Peoples (10.3%, 270 cases) and Other (4.3%, 113 cases) ethnicity.

Table 14. Confirmed chlamydia cases by ethnicity and clinic setting, 2013

Ethnicity	Clinic type	
	SHC	FPC
European	2193	1277
Māori	1838	974
Pacific Peoples	502	270
Other	393	113
Unknown	61	111
Total	**4987**	**2745**

Trends in sex, age and ethnicity

Between 2009 and 2013, the number of confirmed chlamydia cases reported by SHCs decreased for both males and females in the 15–19 years age group (from 472 to 459 and 1220 to 959 cases respectively) but increased in all other age groups except for females in the under 15 years age group which remained the same (Figure 12).

A different trend is seen in FPCs. Case numbers in the 15–19 years age group increased between 2009 and 2013 in males and females (Figure 13) and decreased or remained stable in all other age groups.

Figure 12. Chlamydia case numbers in SHCs by sex and age group, 2009–2013

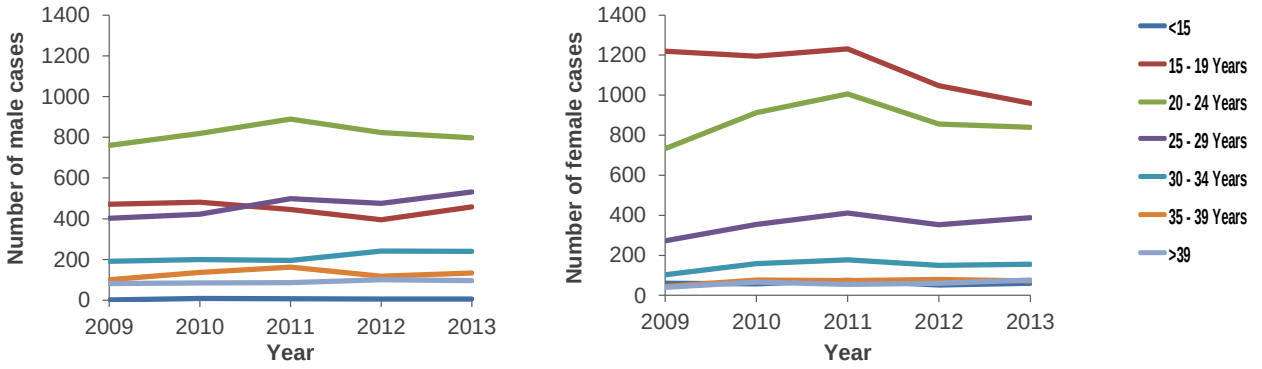
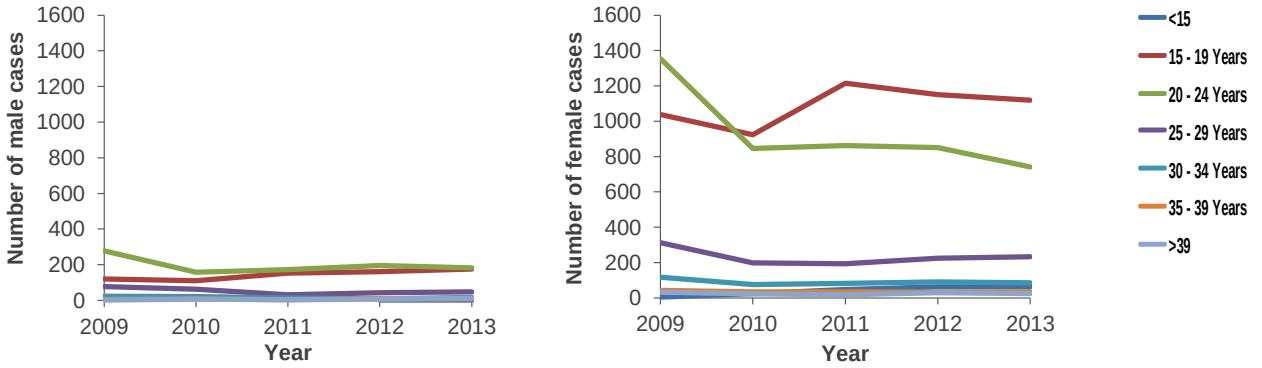


Figure 13. Chlamydia case numbers in FPCs by sex and age group, 2009–2013



In SHCs, there was an increase in the number of people diagnosed with chlamydia in all ethnic groups from 2009 to 2013 (Figure 14).

In FPCs, there was a decrease in the numbers of people diagnosed with chlamydia in all ethnic groups from 2009 to 2013 (Figure 15).

Figure 14. Chlamydia case numbers reported from SHCs by ethnicity, 2009–2013

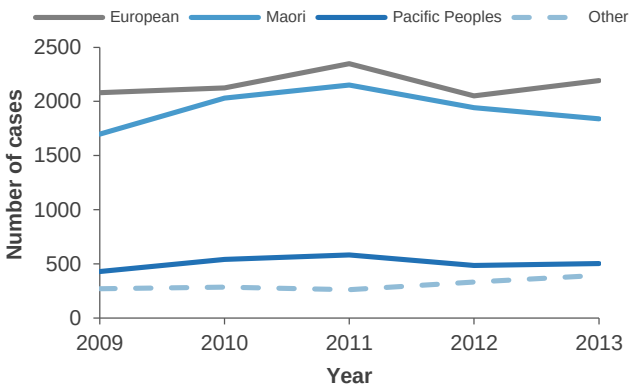
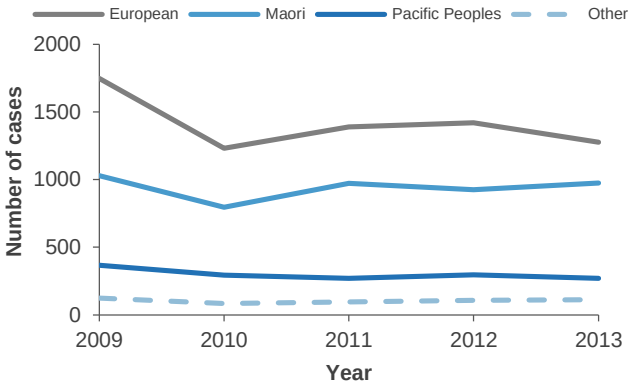


Figure 15. Chlamydia case numbers reported from FPCs by ethnicity, 2009–2013



Site of infection

2013 analysis

In 2013, chlamydia cases were most commonly confirmed from a sample taken at a urogenital site in both clinic types, 94.6% of SHC cases (4720 cases) and 97.3% of FPC cases (2670).

Table 15 presents the number of confirmed chlamydia cases by site of infection and clinic setting in 2013.

Table 15. Chlamydia case numbers by site of infection and clinic setting, 2013

Site	Clinic type	
	SHC	FPC
Urogenital	4720	2670
Pelvic inflammatory disease/epididymitis	239	78
Other site	46	5
Total	**4987**	**2745**

Complicated infections

2013 analysis

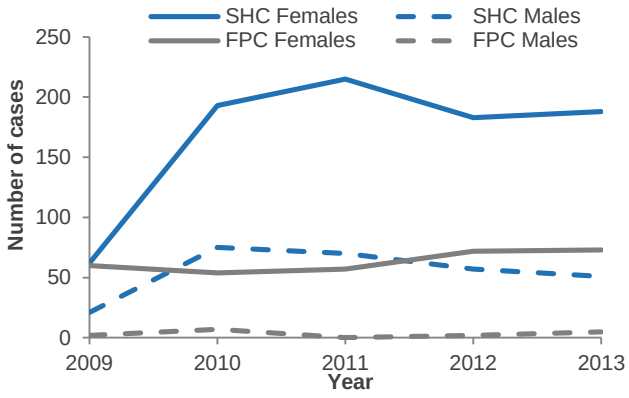
Complicated infections (epididymitis in males and pelvic inflammatory disease (PID) in females) were reported for 4.8% (239/4987) of chlamydia cases in SHCs and 2.8% (78/2745) of cases in FPCs. A total of 56 males (51 in SHCs and 5 in FPCs) were reported with epididymitis, with 32.1% (18 cases) aged less than 25 years.

Ethnicity was recorded for 96.4% (54/56) of male epididymitis cases. The highest percentage of cases were of European ethnicity (64.8%, 35 cases), followed by Māori (22.2%, 12 cases), Other (7.4%, 4 cases) and Pacific Peoples (5.6%, 3 cases) ethnicity. A total of 261 females (188 in SHCs and 73 in FPCs) were reported with PID, with 69.3% (181 cases) aged less than 25 years. Of the 253 cases (96.9%) where ethnicity was recorded, the highest percentage of cases were of European ethnicity (42.7%, 108 cases), followed by Māori (41.1%, 104 cases), Pacific Peoples (12.3%, 31 cases) and Other (4.0%, 10 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 2009 to 2013. Notably, the numbers of complicated infections seen in SHCs have more than doubled in both females and males (62 to 188 cases and 21 to 51 cases, respectively). There has been little change in the numbers of complicated infections seen in FPCs.

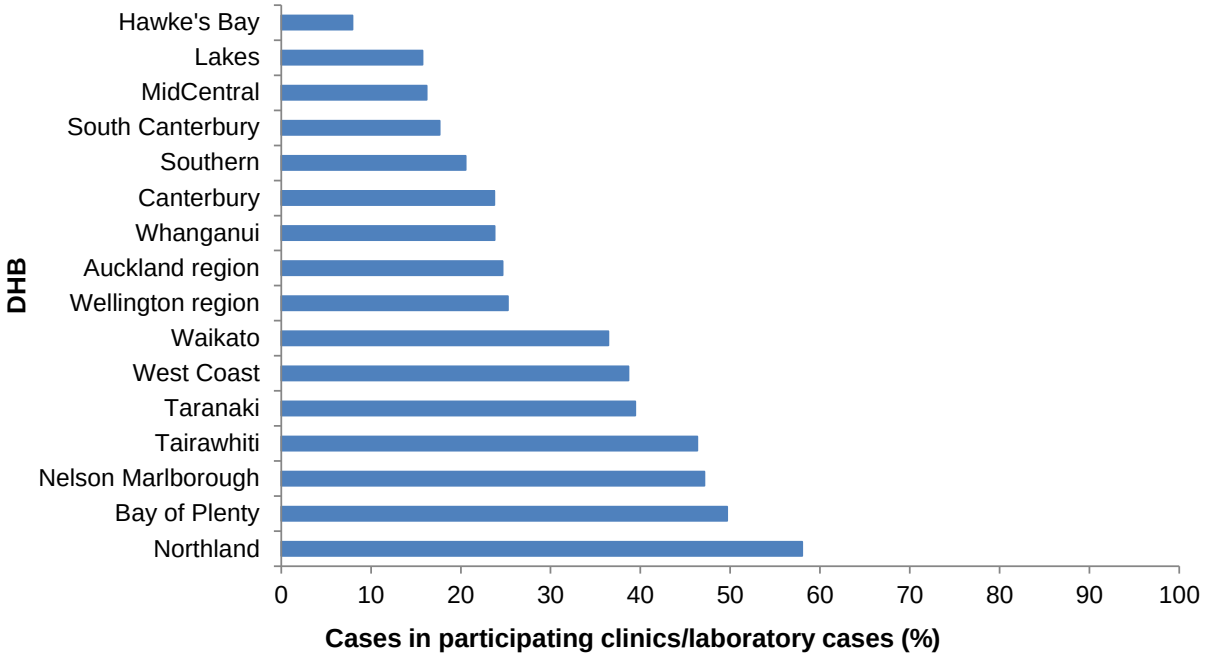
Figure 16. Numbers of epididymitis cases in males and PID cases in females by clinic type, 2009–2013



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 (Analysis 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 seen in a participating clinic was in Northland (58.0%), followed by Bay of Plenty (49.7%) and Nelson Marlborough (47.1%) DHBs. The lowest proportion of chlamydia cases seen in a participating clinic was in Hawke's Bay (7.9 %) and Lakes (15.7 %) DHBs.

Figure 17. Cases of chlamydia seen in participating clinics as a proportion (%) of all positive laboratory tests by DHB, 2013



GONORRHOEA

GONORRHOEA

Key findings

- In 2013, the estimated national rate of gonorrhoea was 78 cases per 100 000 population.
- The 2013 rate decreased from 2012 but remained higher than the estimated rates from 2009 to 2011.
- The highest rate of gonorrhoea rate was in Tairawhiti DHB, with 400 cases per 100 000 population – more than five times the estimated national rate.
- The national rate for males was higher than for females (82 and 72 per 100 000 population respectively).
- Gonorrhoea rates were stable or lower for most age groups in 2013 but the decrease was greatest for females in the 15–19 years age group.
- Two cases of laboratory diagnosed gonorrhoea were 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 anorectal gonorrhoeal infections diagnosed in men at SHCs more than doubled between 2009 and 2013. The number of pharyngeal infections in the same group more than tripled.
- *N. gonorrhoeae* isolates with decreased susceptibility to ceftriaxone were identified in the Auckland region and in Waikato DHB in 2013.

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 [8]. Untreated gonococcal infection may be associated with long-term serious sequelae, including PID in females, epididymo-orchitis in males and severe conjunctivitis in neonates [7].

Laboratory surveillance of gonorrhoea

National and DHB analysis

2013 analysis

All DHBs except Northland met the criteria for gonorrhoea reporting in 2013.These DHBs reported positive tests from 3344 patients. The estimated national gonorrhoea rate, was 78 per 100 000 population (95% CI [72, 84]). See Analysis methods for detail about new data processing methods introduced in 2013 that allowed for exclusion of repeat tests.

The highest numbers of laboratory-confirmed gonorrhoea cases were seen in the Auckland region (1596 cases) and in Waikato DHB (306 cases). There was wide variation in the population rates by DHB from 400 per 100 000 population in Tairawhiti DHB to 8 per 100 000 population in Taranaki DHB (Table 16).

Table 16. Number of gonorrhoea laboratory-confirmed cases and population rates by DHB, 2013

District Health Board	Number of laboratory-confirmed cases	Rate per 100 000 population
Northland[a]	-	-
Auckland region[b]	1596	103
Waikato	306	82
Lakes	145	141
Bay of Plenty	145	68
Tairawhiti	187	400
Taranaki	9	8
Hawke's Bay	243	156
Whanganui	23	37
MidCentral	51	30
Wellington region[c]	262	59
Wairarapa	12	30
Nelson Marlborough	17	12
West Coast	7	21
Canterbury	242	48
South Canterbury	7	12
Southern	92	30
Total	**3344**	**78**

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

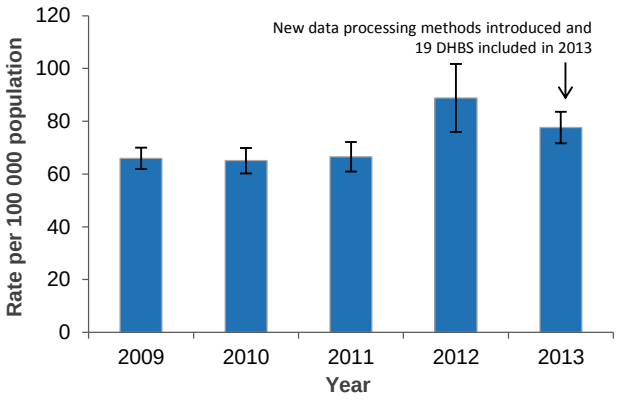
Trends in laboratory diagnoses

1. National rate trend analysis

All DHBs where data was available were included in the national estimated rate trend analysis for gonorrhoea (Analysis methods). From 2012 to 2013, the estimated national gonorrhoea rate decreased (from 89 to 78 per 100 000 population) while from 2009 to 2013, the estimated national gonorrhoea rate increased by 17.7% (from 66 to 78 per 100 000 population). The introduction of nucleic acid amplification (NAAT) testing for gonorrhoea may explain this observed increase (Appendix E). The estimated national gonorrhoea rates from 2009 to 2013, with a 95% confidence interval indicated, are shown in Figure 18.

Comparison of 2013 national and DHB rates with the 2009-2012 estimated rates should be interpreted with caution due to the introduction of a process to exclude repeat tests for an individual and the addition of DHBs that were not previously reporting. Overall, 21.1% (968) of positive specimens were excluded as they were considered to be repeat tests. However, to directly compare 2013 data with previous years, an annual rate was estimated for 2013 using only the 17 DHBs that contributed data from 2009–2012 and including repeat tests for 2013. The estimated rate for 2013 (115 per 100 000) was higher than the 2012 estimate (88 per 100 000) and the estimates for 2009–2011 (66–68 per 100 000).

Figure 18. Estimated national gonorrhoea rate, 2009–2013



Note: Estimated rates were calculated for 2009–2012 with 95% CI's based on data from 17 DHBs.
Estimated rates were calculated for 2013 with 95% CI's based on data from 19/20 DHBs.
New data processing methods allow for exclusion of repeat tests within a defined period (see Analysis methods).

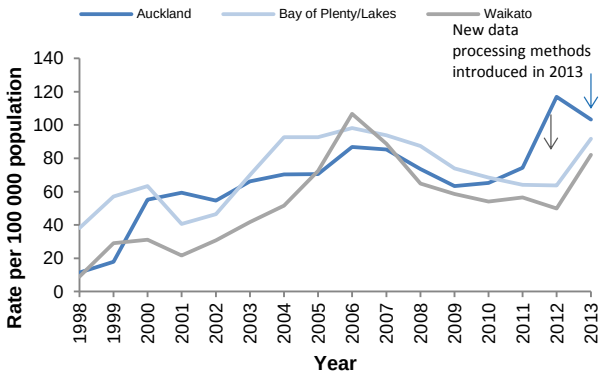
2. Long term trend analysis

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 2011, with an increase in gonorrhoea rates from 1998 to 2006 followed by a steady decline. From 2012 to 2013, gonorrhoea rates have increased for Waikato and Lakes/Bay of Plenty but there has been a decrease (from 117 to 103 per 100 000, 12%) in the Auckland region. Figure 19 presents gonorrhoea rates in these three areas from 1998 to 2013.

3. Individual DHB trend analysis

Seventeen DHBs met the selection criteria for the individual DHB trend analysis (Analysis methods). From 2009 to 2013, 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 Appendix E). The most notable observation is the continued high gonorrhoea rate in Tairawhiti DHB. Notable trends this period were increasing rates in Waikato, Lakes and Bay of Plenty DHBs and decreasing rates in Taranaki, MidCentral and Southern DHBs.

Figure 19. Gonorrhoea rates in selected regions, 1998–2013

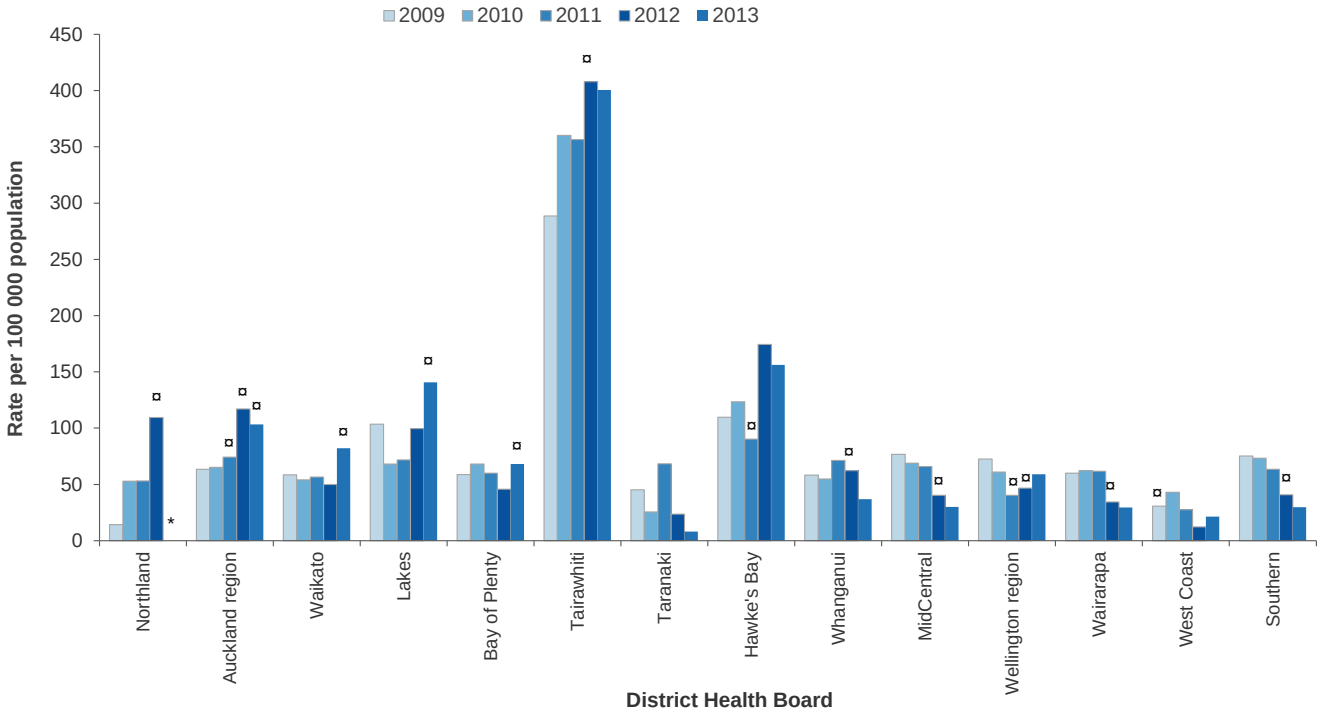


Note: Auckland region includes Waitemata, Auckland and Counties Manukau DHBs.

↓ 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, 2009–2013



* Data incomplete.

Notes: Auckland region includes Waitemata, Auckland and Counties Manukau DHBs. Wellington region includes Hutt Valley and Capital & Coast DHBs.

¤ Introduction of NAAT testing (see Appendix E).

Age and sex distribution of laboratory-confirmed cases

2013 analysis

Age and sex information was recorded for 98.9% of the laboratory-confirmed gonorrhoea cases. The national rate for males (82 per 100 000 population, 1742 cases) was higher than the national rate for females (72 per 100 000 population, 1566 cases) (Table 17). The highest rate of gonorrhoea in males was reported for Tairawhiti DHB (371 per 100 000, 85 cases), followed by Hawke's Bay (133 per 100 000, 100 cases) and Lakes (127 per 100 000, 65 cases) DHBs. In females the highest rate of gonorrhoea was also reported in Tairawhiti DHB (423 per 100 000, 101 cases), followed by Hawke's Bay (180 per 100 000, 143 cases) and Lakes (151 per 100 000, 80 cases) DHBs.

The mean age of laboratory-confirmed gonorrhoea cases was 24.8 years (median age 21 years, range 0–71 years). Fifty-nine percent (1959/3307) 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 both females and males (445 per 100 000 population, 640 cases; 275 per 100 000 population, 418 cases respectively). The highest DHB age-specific rate was in the 15–19 years age group from Tairawhiti DHB (2348 per 100 000 population, 79 cases). Table 18 presents the number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and age group for 2013. Two cases of gonorrhoea were reported in the less than one year age group.

Table 17. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and sex, 2013

District Health Board	Number of laboratory-confirmed cases				Rate per 100 000 population[d]		
	Male	Female	Unknown	Total	Male	Female	Total
Northland[a]	-	-	-	-	-	-	-
Auckland region[b]	934	660	2	1596	123	84	103
Waikato	126	180	0	306	69	95	82
Lakes	65	80	0	145	127	151	141
Bay of Plenty	56	71	18	145	54	65	68
Tairawhiti	85	101	1	187	371	423	400
Taranaki	6	3	0	9	11	-	8
Hawke's Bay	100	143	0	243	133	180	156
Whanganui	15	8	0	23	50	26	37
MidCentral	32	19	0	51	39	22	30
Wellington region[c]	144	117	1	262	66	52	59
Wairarapa	5	7	0	12	25	34	30
Nelson Marlborough	12	5	0	17	17	7	12
West Coast	3	4	0	7	-	-	21
Canterbury	116	121	5	242	46	47	48
South Canterbury	3	3	1	7	-	-	12
Southern	40	44	8	92	26	28	30
Total[d]	**1742**	**1566**	**36**	**3344**	**82**	**72**	**78**

[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 18. Number of laboratory-confirmed gonorrhoea cases and gonorrhoea rates by DHB and age group, 2013

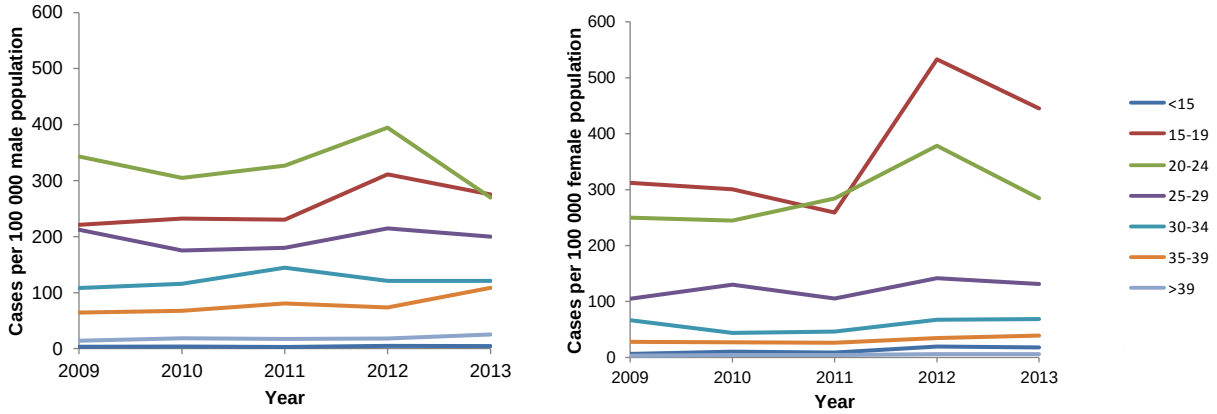
District Health Board	Age Group (years)[d]																					
	0–4		5–9		10–14		15–19		20–24		25–29		30–34		35–39		40+		Unknown		Total	
	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000	Cases	Rate per 100 000
Northland[a]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Auckland region[b]	4	-	0	-	16	16	380	351	425	347	290	233	158	136	116	112	207	32	0	–	1596	103
Waikato	1	0	0	-	22	87	126	472	76	272	44	190	18	80	8	38	11	6	0	–	306	82
Lakes	0	0	0	-	5	66	64	896	40	584	18	294	7	121	6	97	4	-	1	–	145	141
Bay of Plenty	0	0	0	-	5	34	47	344	38	302	14	131	10	92	7	61	7	6	17	–	145	68
Tairawhiti	0	0	0	-	12	327	79	2348	53	1752	18	649	9	380	8	311	8	37	0	–	187	400
Taranaki	0	0	0	-	2	-	4	-	2	-	0	-	0	-	0	-	1	-	0	–	9	8
Hawke's Bay	1	-	0	-	16	146	131	1225	56	606	15	184	6	77	13	150	5	6	0	–	243	156
Whanganui	0	0	0	-	0	-	11	261	8	198	1	-	0	-	0	-	0	-	3	–	23	37
MidCentral	0	0	0	-	0	-	24	190	12	83	8	76	4	-	0	-	2	-	1	–	51	30
Wellington region[c]	0	0	0	-	1	-	85	292	80	222	36	103	19	59	13	43	27	14	1	–	262	59
Wairarapa	0	0	0	-	1	-	5	207	3	-	1	-	1	-	0	-	1	-	0	–	12	30
Nelson Marlborough	0	-	0	-	0	-	1	-	6	76	3	-	4	-	2	-	1	-	0	–	17	12
West Coast	0	0	0	-	0	-	3	-	3	-	1	-	0	-	0	-	0	-	0	–	7	21
Canterbury	0	-	0	-	6	20	82	235	67	173	30	91	17	55	11	35	24	10	5	–	242	48
South Canterbury	0	-	0	-	0	-	1	-	0	-	2	-	1	-	2	-	0	-	1	–	7	12
Southern	0	0	0	-	2	-	16	73	31	114	15	72	9	48	7	39	4	-	8	–	92	30
Total	**6**	**2**	**0**	**-**	**88**	**32**	**1059**	**358**	**900**	**277**	**496**	**167**	**263**	**94**	**193**	**73**	**302**	**15**	**37**	**–**	**3344**	**78**

[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 2009 to 2013, there was a 43% increase in the rate of gonorrhoea in females in the 15–19 years age group (from 312 to 445 cases per 100 000 population). Small increases in gonorrhoea rates were observed in some other age groups for both sexes over this time (including the 15–19 years age group for males). Gonorrhoea rates per 100 000 population by age group and sex from 2009 to 2013 are presented in Figure 21.

Figure 21. Gonorrhoea rates per 100 000 population by sex and age group, 2009–2013



Note: Estimated rates were calculated for 2009–2012 based on data from 15 DHBs. All DHB s except Northland were included in 2013. New data processing methods introduced in 2013 allow for exclusion of repeat tests within a defined period (see Analysis methods).

Test positivity and population testing rates

2013 analysis

The 42 laboratories representing 19 DHBs for gonorrhoea reporting tested 432 096 specimens for gonorrhoea, of which 1.1% (4590 specimens) tested positive from 3344 patients. The population testing rate was 100 gonorrhoea tests per 1000 population. The specimen counts did not exclude repeat samples from the same individual.

Table 19 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 2013.

The highest population testing rates were reported from Nelson Marlborough (131 per 1000 population), Canterbury (114 per 1000 population) DHBs and the Auckland region (111 per 1000 population) (Note: Nelson Marlborough DHB performed two tests for most patients due to a change in laboratory processes). Tairawhiti DHB had the highest percentage of positive specimens (4.6%), followed by Hawke's Bay DHB (2.4%).

Table 20 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 2013.

The highest population testing rates were reported in the 20–24 years age group for both males and females (119 per 1000 population and 564 per 1000 population, respectively). Males in the 10–14 years and the 15–19 years age groups had the highest percentage of positive specimens (5.3% and 5.9% respectively).

Table 19. 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, 2013

District Health Board	Total specimens	Tests per 1000 population	Specimens tested positive (%)[a]	Number of laboratory-confirmed cases[b]
Northland[c]	-	-	-	-
Auckland region[d]	171 048	111	1.4	1596
Waikato	39 582	106	1.0	306
Lakes	10317	100	1.5	145
Bay of Plenty	14 764	69	1.1	145
Tairawhiti	4498	96	4.6	187
Taranaki[e]	10 903	98	0.1	9
Hawke's Bay	14 884	96	2.4	243
Whanganui	2567	41	0.9	23
MidCentral	9591	57	0.5	51
Wellington region[f]	40 725	92	0.8	262
Wairarapa	1684	41	0.8	12
Nelson Marlborough[g]	18 512	131	0.1	17
West Coast	2191	67	0.4	7
Canterbury	57 605	114	0.7	242
South Canterbury	3734	65	0.2	7
Southern	29 491	95	0.4	92
Total	**432 096**	**100**	**1.1**	**3344**

[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 20. 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, 2013

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	834	937	1779	6	7	6	0.1	0.9	0.5	1	5	6
5–9	71	270	341	0	2	1	0.0	0.0	0.0	0	0	0
10–14	416	3125	3546	3	24	13	5.3	2.4	2.9	17	68	86
15–19	10 064	51 748	61 905	68	369	215	5.9	1.5	2.2	415	639	1055
20–24	19 599	86 058	105 757	119	564	333	3.4	0.6	1.1	454	444	898
25–29	14 165	57 246	71 480	96	398	246	2.9	0.3	0.9	301	193	496
30–34	8960	43 511	52 534	67	311	193	2.7	0.3	0.4	165	98	263
35–39	6506	32 017	38 554	52	237	149	1.5	0.2	0.7	138	54	193
40+	17 438	64 581	82 108	19	64	42	1.9	0.1	0.3	241	60	301
Unknown	161	218	640	-	-	-	1.9	1.4	7.8	4	2	37
Total[e]	**78 214**	**339 711**	**418 644**	**38**	**159**	**100**	**3.1**	**0.6**	**1.1**	**1736**	**1563**	**3335**

[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.

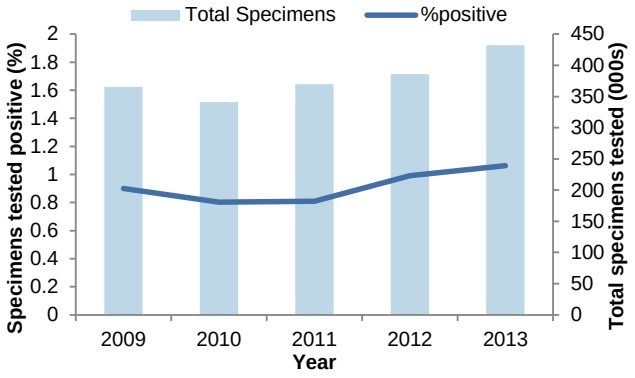
[d] Includes unknown sex.

[e] Estimated counts for the first three quarters of 2013 for one laboratory in the Auckland region (LabPlus) have been included, as counts in the new format were only provided for the last quarter of 2013 (Analysis methods).

Trends in test positivity

All DHBs from which data was available were included in the trend analysis of test positivity rates (Figure 22). Between 2009 and 2013, the percentage of positive results recorded for all specimens tested for gonorrhoea, increased slightly from 0.9% to 1.1%. With the addition of DHBs in 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 (2009–2012). However, 92% (396 906/432 096) of the total number of specimens tested in 2013 recorded this information of which 78% were NAATs and the remainder were cultures.

Figure 22. Percentage of positive specimens tested and total specimens tested for gonorrhoea, 2009–2013



Specimen site

2013 analysis

The site from which a specimen was taken was recorded for 98.2% (3545/3571) of positive specimens, based on gonorrhoea data from 39 laboratories (Analysis methods). In males, the most common specimen site was the urethra (42.7%, 790/1852 positive specimens). In females, the most common specimen site was the cervix (51.3%, 850/1656 positive specimens). In both males and females, the proportion of positive sites that were not urogenital was comparatively low (255/1852, 13.8% for males, and 92/1656, 5.6% for females) (Table 21).

Table 21. Percentage of positive gonorrhoea tests by specimen site and sex, 2013

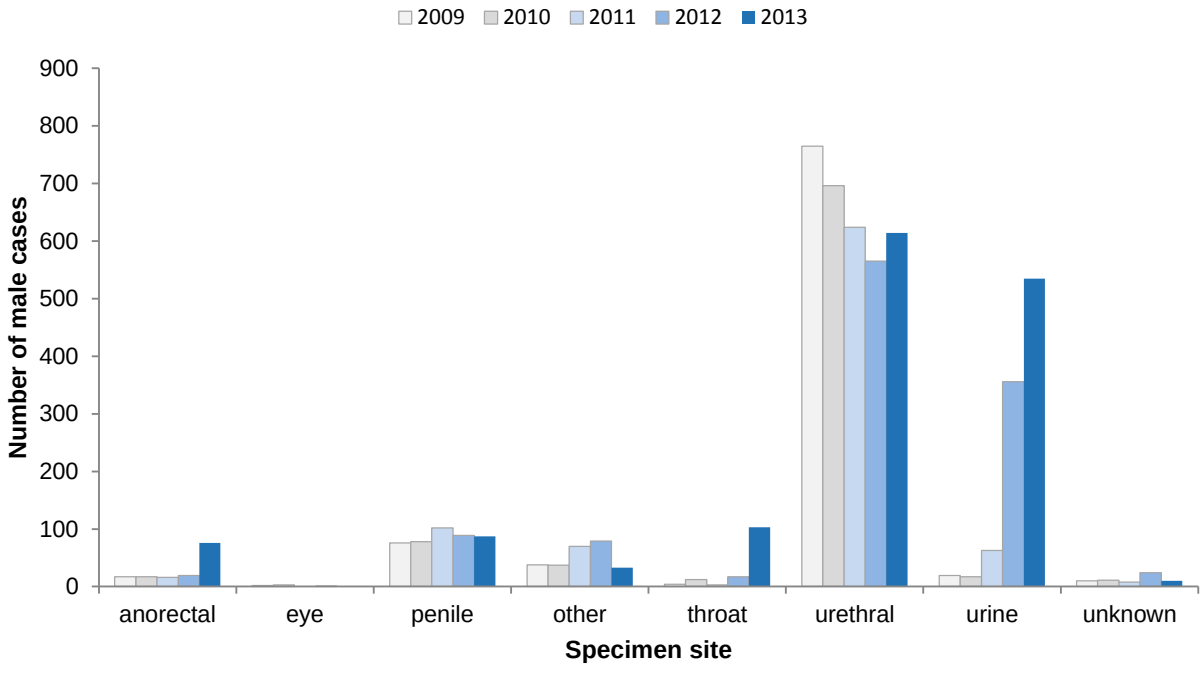
Specimen site[a]	Sex	
	Male	Female
Urethral	42.7	1.7
Vaginal	-	31.6
Cervix	-	51.3
Penile	5.3	-
Anorectal	5.2	0.7
Eye	0.1	0.1
Urine	38.3	9.7
Urogenital[b]	0.0	0.1
Throat	6.6	0.7
Other	1.9	4.1

[a] Includes data from 40 laboratories.
[b] Pooled specimens from more than one site.

Trends in specimen site

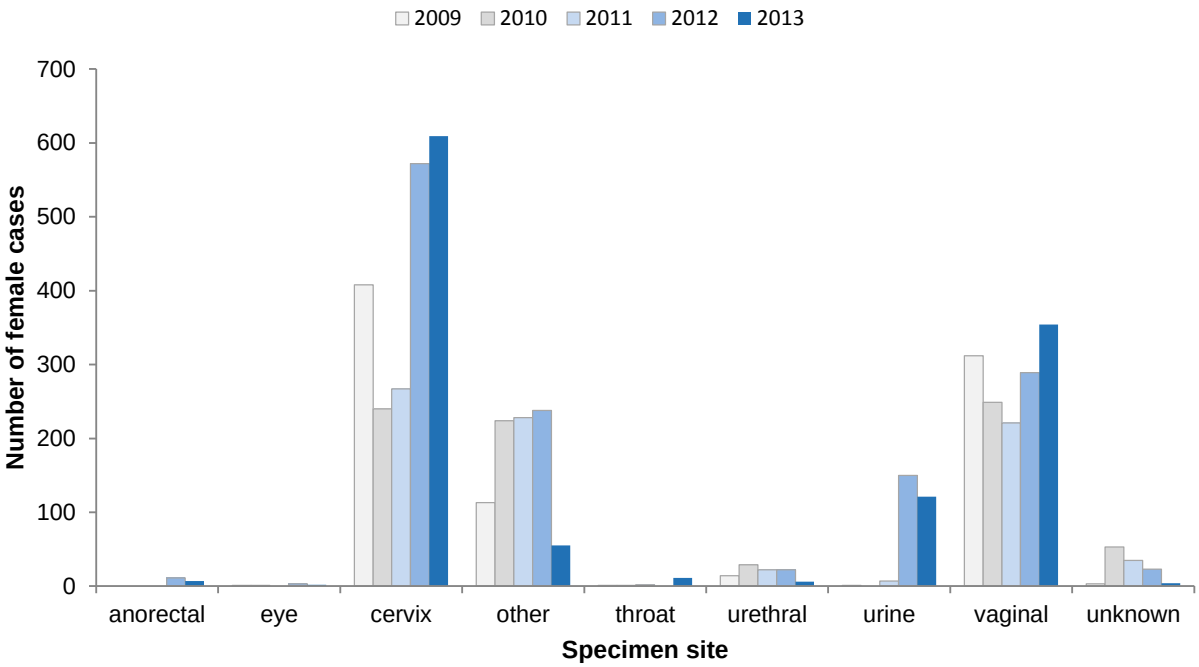
Figure 23 and Figure 24 present the specimen site of positive gonorrhoea tests, reported by 29 laboratories from 2009 to 2013 for females and males (Analysis methods). There was a decrease in the number of positive tests from urethral specimens in males. There has also been a large increase in the number of positive specimens from urinary specimens in both females and males, and cervical specimens in females.

Figure 23. Specimen site, all positive gonorrhoea tests in males, 2009–2013



Note: Includes data from 29 laboratories.

Figure 24. Specimen site, all positive gonorrhoea tests in females, 2009–2013



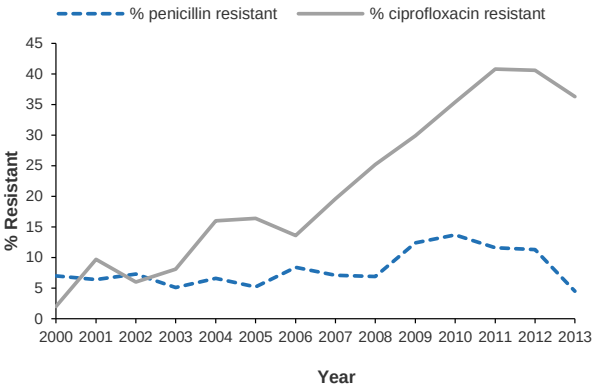
Note: Includes data from 29 laboratories.

Antibiotic resistance surveillance

In 2013 the prevalence of resistance to penicillin and ciprofloxacin among *N. gonorrhoeae* isolates was 4.5% and 36.3% respectively. This rate of penicillin resistance is the lowest rate seen since 2000. Ciprofloxacin resistance decreased by about 4 percentage points from the 2012 rate of 40.6%. In 2013, penicillin resistance ranged from 22.3% in Southern DHB to 0.0% in Tairawhiti and West Coast DHBs. Ciprofloxacin resistance ranged from 75.7% in MidCentral/Whanganui DHBs to 0.0% in West Coast DHB. Data was only provided from some of the laboratories for Northland and Taranaki DHBs (Table 22). The prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates from 2000 to 2013 is shown 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, isolates with decreased susceptibility to ceftriaxone (MICs typically 0.06 mg/L) have been identified in the Auckland region and in Waikato DHB.

Figure 25. Prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates, 2000–2013



Note: As of 2013, data is received from laboratories participating in STI laboratory surveillance.

Table 22. Penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates by DHB, 2013

District Health Board[a]	Penicillin		Ciprofloxacin	
	Number tested	% resistant	Number tested	% resistant
Northland	-	-	-	-
Auckland region[b, c]	-	-	429	35.4
Waikato	101	1.0	102	35.3
Lakes	43	7.0	44	31.8
Bay of Plenty	83	1.2	84	36.9
Tairawhiti	5	0.0	29	48.3
Taranaki	-	-	-	-
Hawke's Bay	91	5.5	91	25.3
MidCentral/Whanganui	-	-	74	75.7
Wairarapa	-	-	13	61.5
Wellington region[d]	-	-	18	72.2
Nelson Marlborough	9	22.2	5	0.0
West Coast	2	0.0	2	0.0
Canterbury region[e]	72	4.2	133	19.5
Southern	16	22.3	31	7.3
Total[a]	**422**	**4.5**	**1055**	**36.3**

[a] Data incomplete for Northland and Taranaki DHBs.
[b] Waitemata, Auckland and Counties Manukau DHBs.
[c] Labplus in the Auckland region did not provide data from January-September.
[d] Hutt Valley and Capital & Coast DHBs.
[e] Canterbury and South Canterbury DHBs.

Clinic surveillance of gonorrhoea

National analysis

2013 analysis

In 2013, the number of gonorrhoea cases reported by SHCs and FPCs were 820 and 247 respectively (Table 23).

Table 23. Gonorrhoea case numbers by clinic type, 2013

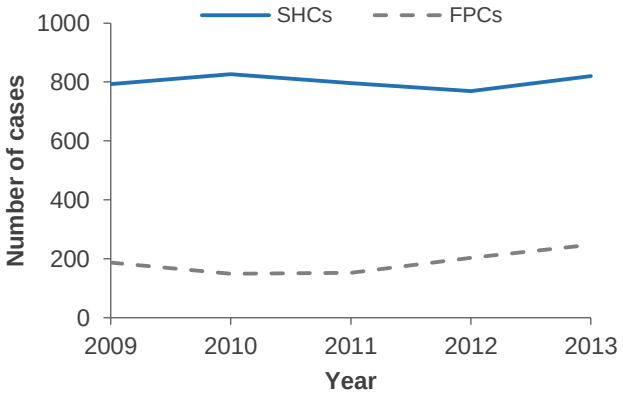
Clinic type	Total Number of cases
SHC	820
FPC	247
Total	**1067**

Trends in national totals

Between 2012 and 2013, gonorrhoea case numbers reported by SHCs increased by 6.6% (from 769 to 820) and FPCs by 21.7% (from 203 to 247 cases).

From 2009 to 2013, gonorrhoea case numbers reported by SHCs increased by 3.4% (from 793 to 820) and FPCs by 32.1% (from 187 to 247).

Figure 26. Gonorrhoea case numbers by clinic type, 2009–2013



DHB counts

2013 analysis

Clinics in 19 DHBs contributed to gonorrhoea surveillance in 2013. Gonorrhoea case numbers in each DHB by clinic type are presented in Table 24. The highest number of gonorrhoea cases in SHCs was seen in the Auckland region (346 cases) and in Bay of Plenty DHB (87 cases). In DHBs with both SHCs and FPCs, higher case counts were seen in SHCs, except in Tairawhiti and West Coast DHBs.

Table 24. Gonorrhoea case numbers by clinic type and DHB, 2013

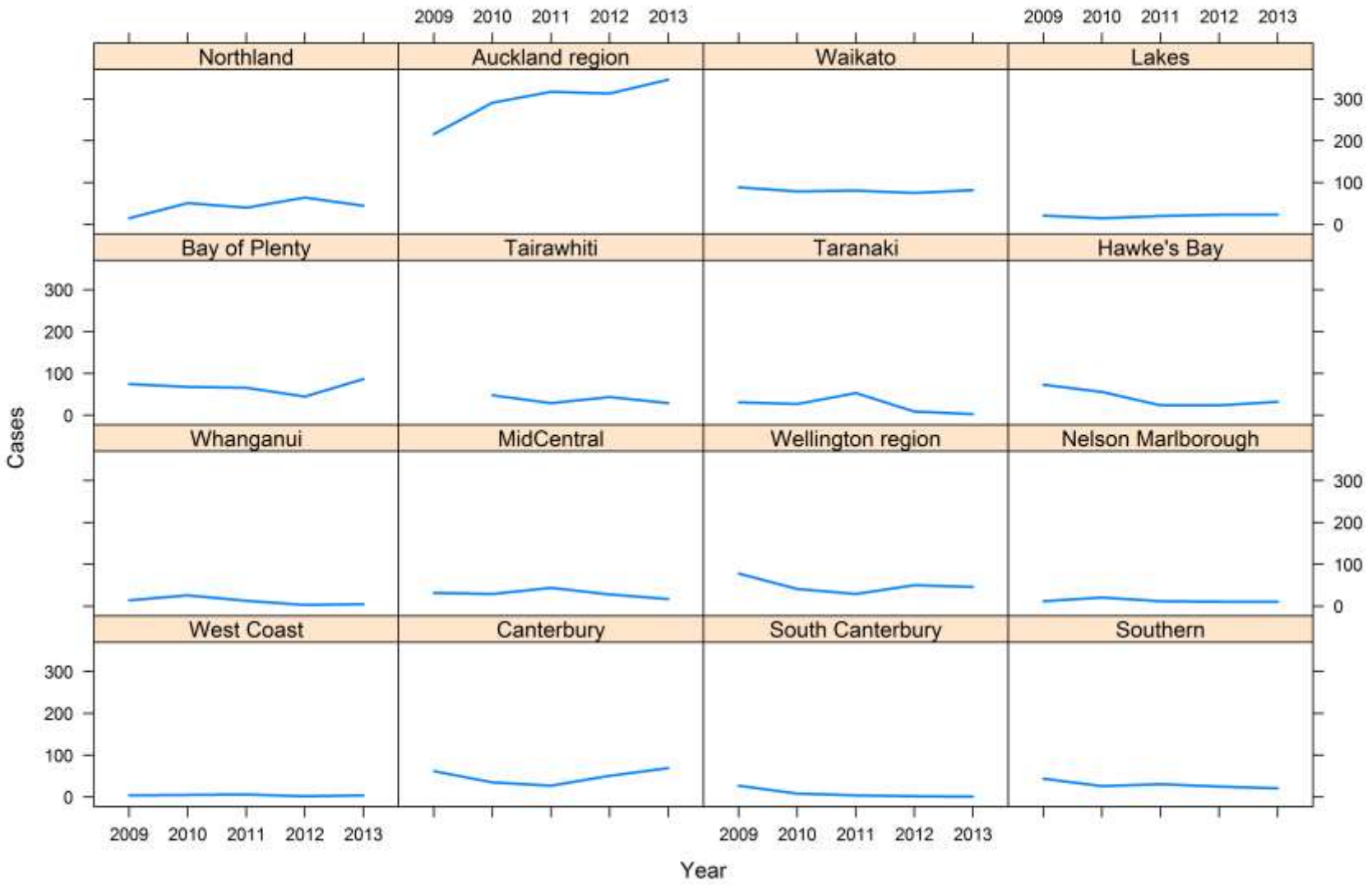
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	45	8	53
Auckland region[a]	346	72	418
Waikato	82	56	138
Lakes	23	0	23
Bay of Plenty	87	2	89
Tairawhiti	29	34	63
Taranaki	3	1	4
Hawke's Bay	32	0	32
Whanganui	5	0	5
MidCentral	17	0	17
Wellington region[b]	46	40	86
Nelson Marlborough	10	4	14
West Coast	4	4	8
Canterbury	69	18	87
South Canterbury	1	0	1
Southern	21	8	29

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

Trends in DHB counts

Gonorrhoea case numbers in SHCs from 2009 to 2013 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 the Auckland region, but a decreasing number of cases were seen in Hawke's Bay DHB and the Wellington region.

Figure 27. Gonorrhoea case numbers in SHCs by DHB, 2009–2013



* Data was not available for Tairawhiti DHB for 2009.

Sex, age and ethnicity distribution of gonorrhoea cases

2013 analysis

Sex was recorded for all gonorrhoea cases. More cases of gonorrhoea were seen in males in SHCs, while in FPCs more cases were seen in females. The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2013, the male to female ratio of attendees at FPCs was 1:24). Table 25 presents the number of cases of gonorrhoea by sex and clinic type for 2013.

Table 25. Gonorrhoea case by sex and clinic type, 2013

Sex	Clinic type	
	SHC	FPC
Male	505	44
Female	315	203
Total	**820**	**247**

Age was recorded for all gonorrhoea cases in 2013. A large proportion of the reported cases of gonorrhoea were aged less than 25 years – 51.7% (424/820) in SHCs and 84.2% (208/247) in FPCs. The mean age of gonorrhoea cases was 26.9 years in SHCs and 20.1 years in FPCs.

The number of males with gonorrhoea was highest in the 20–24 years age group in SHCs (113 cases), while in FPCs, the number of males with gonorrhoea was highest in the 15–19 years age group (25 cases). The number of females with gonorrhoea was highest in the 15–19 years age group across both clinic types – 122 cases (38.7%) in SHCs and 107 cases in FPCs (52.7%).

Figure 28 and Figure 29 present the number of confirmed cases of gonorrhoea by age group and sex for 2013 in SHCs and FPCs.

Figure 28. Gonorrhoea case numbers reported by SHCs by age group and sex, 2013

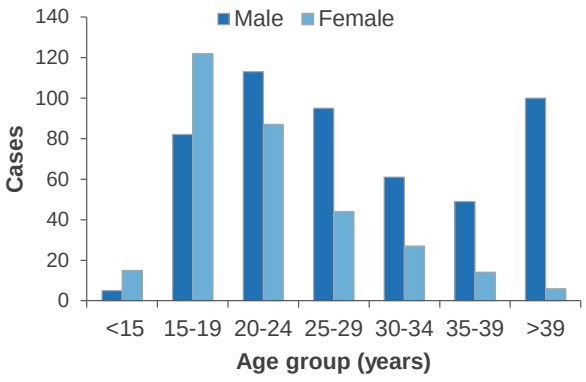


Figure 29. Gonorrhoea case numbers reported by FPCs by age group and sex, 2013

Ethnicity was recorded by SHCs for 97.8% (802/820) of the reported cases of gonorrhoea. The highest percentage of gonorrhoea cases reported by SHCs were of Māori ethnicity (44.5%, 357 cases), followed by European (34.7%, 278 cases), Pacific Peoples (11.2%, 90 cases) and Other (9.6%, 77 cases) ethnicity (Table 26). Ethnicity was recorded by FPCs for 94.7% (234/247) of the reported cases. The highest percentage of gonorrhoea cases reported by FPCs were of Māori ethnicity (55.1%, 129 cases), followed by European (27.4%, 64 cases), Pacific Peoples (14.5%, 34 cases) and Other (3.0%, 7 cases) ethnicity.

Table 26. Gonorrhoea cases by ethnicity and clinic setting, 2013

Ethnicity	Clinic type	
	SHC	FPC
European	278	64
Māori	357	129
Pacific Peoples	90	34
Other	77	7
Unknown	18	13
Total	**820**	**247**

Trends in sex, age and ethnicity

Between 2009 and 2013, the number of cases of gonorrhoea in females reported by SHCs was highest in the 15–19 and 20–24 years age groups. Case numbers in males in the 20–24 year age group continue to be the highest (Figure 30).

FPCs predominantly diagnosed gonorrhoea in females in the 15–19 and 20–24 years age groups. Since 2011, a substantial increase has been seen in the number of female cases in the 15–19 years and 20–24 years age groups (from 56 to 107 cases and from 34 to 56 cases respectively). Male case numbers were consistently low across all age group in FPCs between 2009 and 2013 (Figure 31).

Figure 30. Gonorrhoea cases in SHCs by sex and age group, 2009–2013

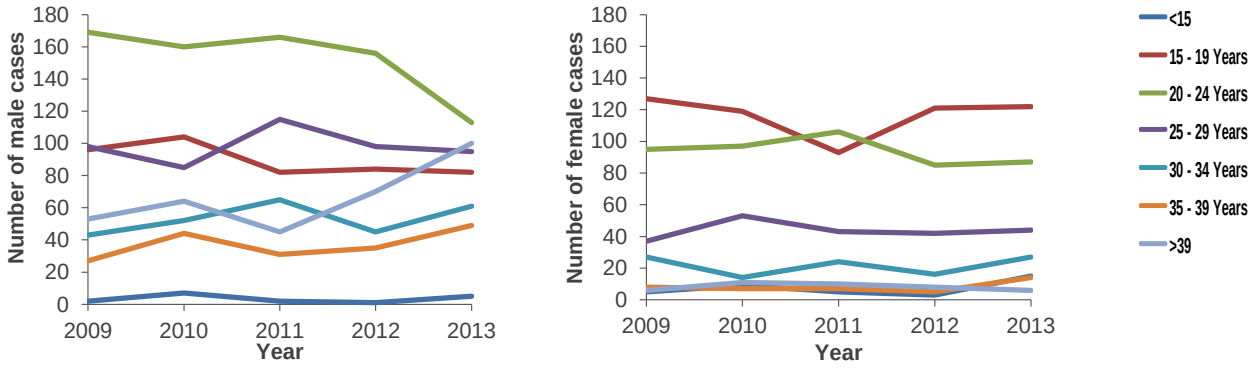


Figure 31. Gonorrhoea cases in FPCs by sex and age group, 2009–2013

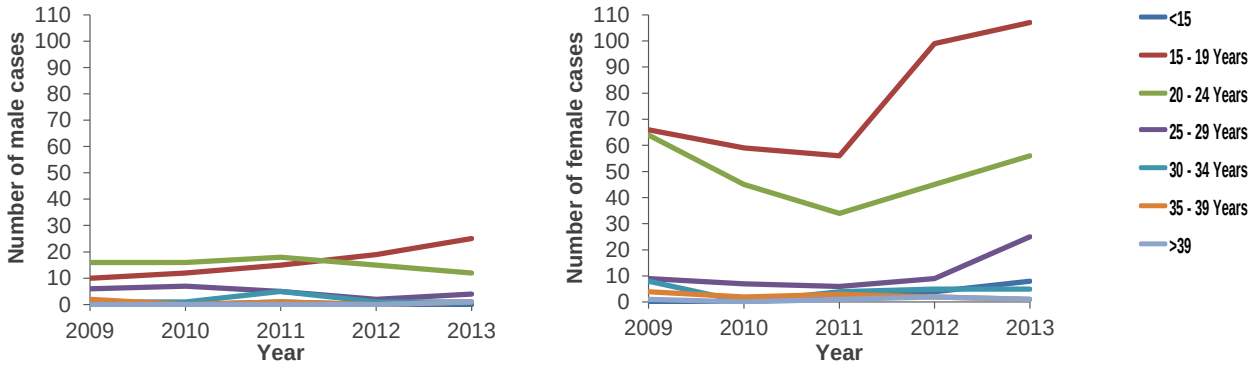


Figure 32 and Figure 33 present the number of cases of gonorrhoea reported from SHCs and FPCs by ethnicity between 2009 and 2013. There was an increase in the number of cases seen in Māori (84 to 129 cases) in FPCs. Of the 129 cases of gonorrhoea in Māori reported by FPCs in 2013, 51.9% were reported from Tairawhiti and Waikato DHBs (32 and 35 cases respectively). There was a decrease in the number of gonorrhoea cases in SHCs in the European ethnic group (305 to 278 cases) between 2009 and 2013.

Figure 32. Gonorrhoea cases reported from SHCs by ethnicity, 2009–2013

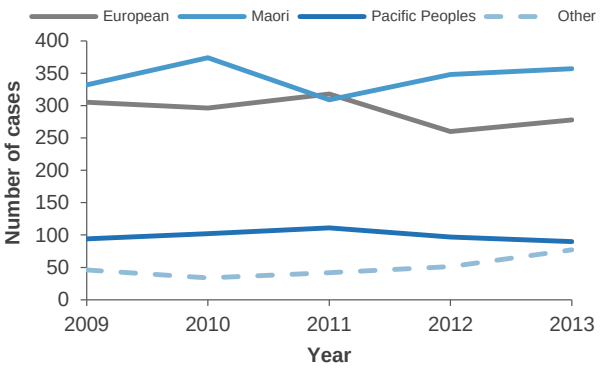
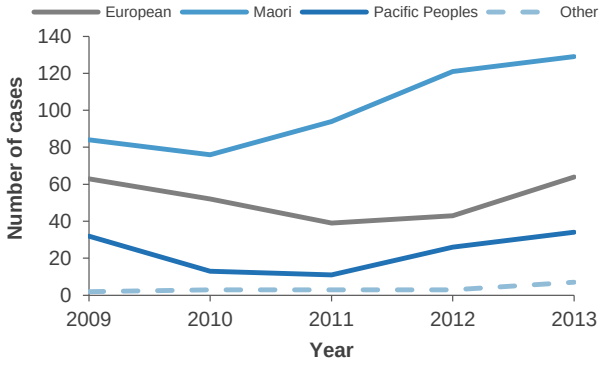


Figure 33. Gonorrhoea cases reported from FPCs by ethnicity, 2009–2013



Site of infection

2013 analysis

In 2013, gonorrhoea cases were most commonly confirmed from a urogenital site in both types of clinic as follows: 82.1% of SHC cases (673 cases) and 87.9% of FPC cases (217 cases) (Table 27).

In SHCs, the next most common site was anorectal with 11.0% (90 cases), followed by the pharynx at 9.5% (78 cases).

Table 27. Gonorrhoea cases by site of infection and clinic setting, 2013

Site	Clinic type	
	SHC	FPC
Urogenital	673	217
Anorectal	90	0
Pelvic inflammatory disease/epididymitis	23	26
Pharynx	78	1
Other site	1	3
Total[a]	**820**	**247**

[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 and Figure 35 present the trends in non-complicated non-urogenital gonorrhoea sites reported by SHCs between 2009 and 2013 for males and females. In males, an increase in anorectal and pharyngeal gonorrhoea infections was reported by SHCs (from 28 to 80 cases and from 18 to 72 cases respectively), between 2009 and 2013. In females, the number of anorectal gonorrhoea infections fluctuated between 5 and 10 cases and pharyngeal infections fluctuated between zero and six cases, between 2009 and 2013. Gonorrhoea infections at other sites have remained low for both sexes.

Figure 34. Site of infection, non-complicated non-urogenital gonorrhoea cases in males in SHCs, 2009–2013

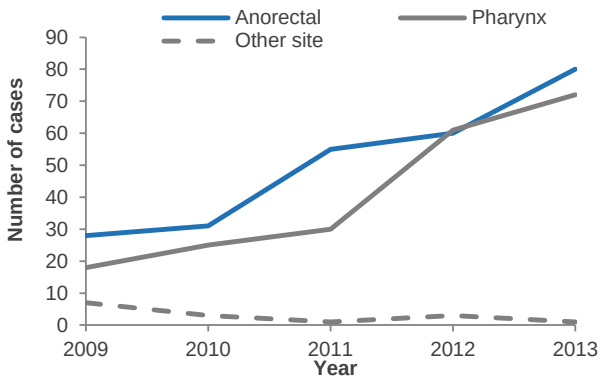
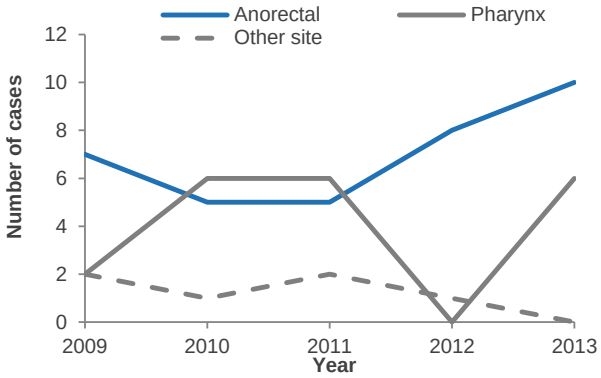


Figure 35. Site of infection, non-complicated non-urogenital gonorrhoea cases in females in SHCs, 2009–2013



Complicated infections

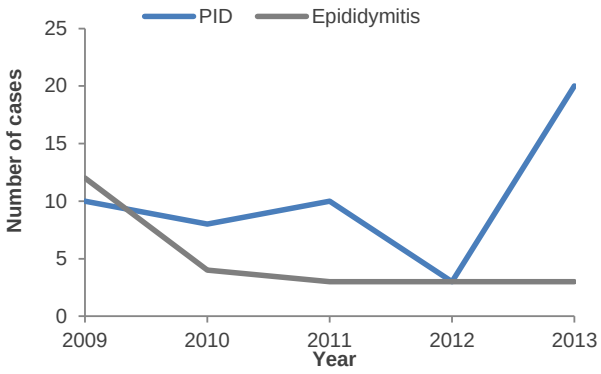
2013 analysis

Complicated infections (epididymitis in males and pelvic inflammatory disease (PID) in females) were reported for 2.8% (23/820) of gonorrhoea cases in SHCs and 10.5% (26/247) of cases in FPCs. A total of five males (three in SHCs and two in FPCs), were reported with epididymitis. Three of the five cases were aged less than 25 years. Three of the epididymitis cases were of Māori ethnicity, one was European and the remaining case was of Pacific Peoples ethnicity. A total of 44 females (20 in SHCs and 24 in FPCs) were reported with PID, 86.4% (38 cases) of whom were aged less than 25 years. Ethnicity was recorded for 95.4% (42/44) of female PID cases, 25 cases (59.5%) were of Māori ethnicity, 11 cases (26.2%) were of European ethnicity, 4 cases (9.5%) were of Pacific Peoples ethnicity and 2 cases (4.8%) were of Other ethnicity.

Trends in complicated infections

Figure 36 presents the trends in cases of complicated gonorrhoea infections reported by SHCs between 2009 and 2013. There was a 100% increase in the number of PID cases caused by gonorrhoea (from 10 to 20 cases) from 2009 to 2013. The number of epididymitis infections dropped from 12 to 4 during 2009 and 2010 and have remained low.

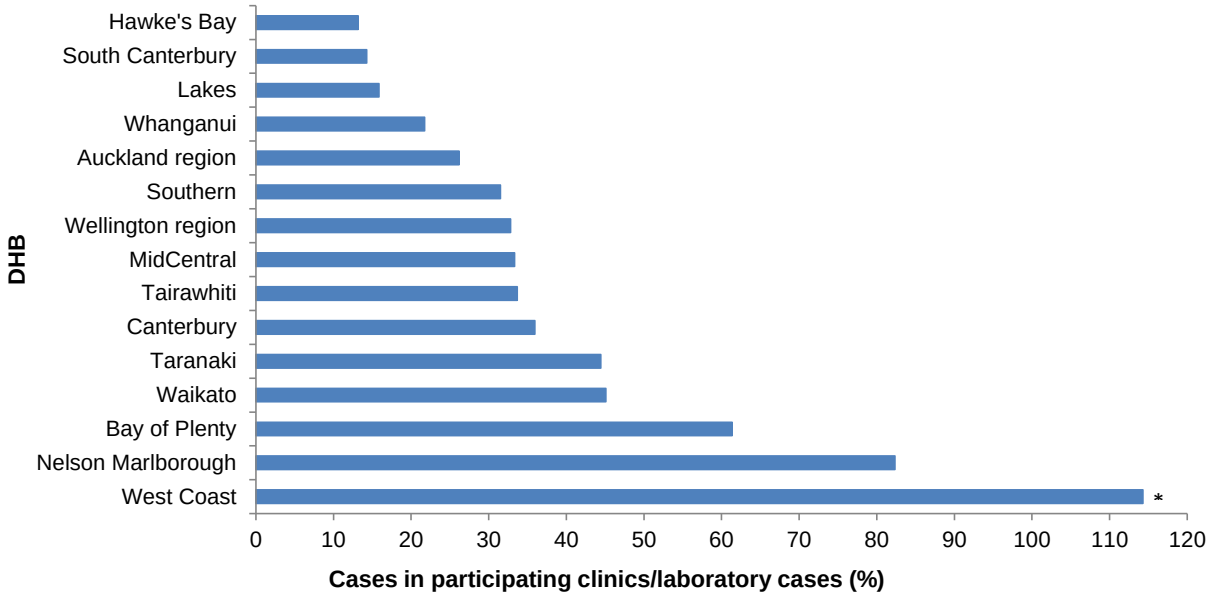
Figure 36. Complicated infections, gonorrhoea cases in SHCs, 2009–2013



Comparison of laboratory and clinic surveillance

Clinic cases as a proportion of laboratory cases are presented in Figure 37 for DHBs that met the selection criteria for gonorrhoea laboratory reporting (Analysis 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 facility. The highest proportion of gonorrhoea cases seen in a participating clinic was in West Coast DHB (114.3%), followed by Nelson Marlborough (82.4%) and Bay of Plenty (61.4%) DHBs. The lowest proportion of gonorrhoea cases seen in a participating clinic was in Hawke's Bay (13.2%) and South Canterbury (14.3%) DHBs.

Figure 37. Cases of gonorrhoea seen in participating clinics as a proportion (%) of all positive laboratory tests by DHB, 2013



*West Coast: Participating clinics reported 8 test positive cases; laboratory data reported 7 test positive cases. The discrepancy may result from a clinic case being tested in a different DHB.

GENITAL HERPES

GENITAL HERPES (FIRST PRESENTATION)

Key findings

- In 2013, 1110 first presentations of genital herpes were reported. 855 cases were seen in SHCs and 255 cases in FPCs.
- Since 2009 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 [9]. 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 earlyto 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 [10].

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 [6]. The ulcerative lesions of HSV facilitate the transmission of HIV infection [11].

Clinic surveillance of genital herpes (first presentation)

National analysis

2013 analysis

In 2013, the number of genital herpes (first presentation) cases reported by SHCs and FPCs were 855 and 255 cases respectively (Table 28).

Table 28. Genital herpes (first presentation) case numbers by clinic type, 2013

Clinic type	Total number of cases
SHC	855
FPC	255
Total	**1110**

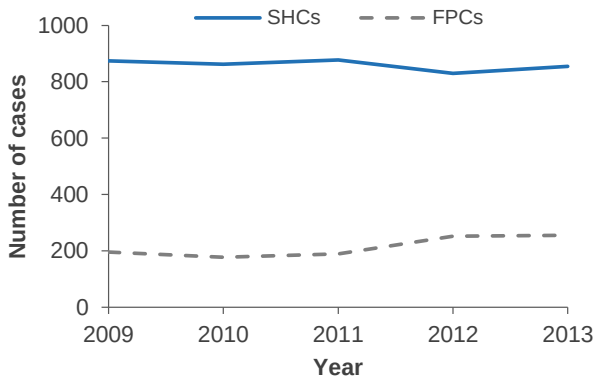
Trends in national totals

Between 2012 and 2013, genital herpes clinic case counts reported by SHCs increased by 3.0% (from 830 to 855 cases) and FPCs by 1.2% (252 to 255 cases).

From 2009 to 2013, genital herpes clinic case counts reported by SHCs decreased by 2.2% (from 874 to 855 cases). By contrast, genital herpes clinic case counts increased by 30.1% in FPCs (from 196 to 255 cases) (Figure 38).

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 38. Genital herpes (first presentation) cases by clinic type, 2009–2013



DHB counts

2013 analysis

Clinics in 19 DHBs contributed to genital herpes surveillance in 2013. The numbers of genital herpes cases in each clinic type by DHB are presented in Table 29. The highest case numbers of genital herpes in SHCs and FPCs were seen in the Auckland region (219 and 51 cases, respectively) and in Canterbury (128 and 41 cases, respectively) DHB. In DHBs with both SHCs and FPCs, higher genital herpes case counts were seen in SHCs.

Table 29. Genital herpes (first presentation) case numbers by clinic type and DHB, 2013

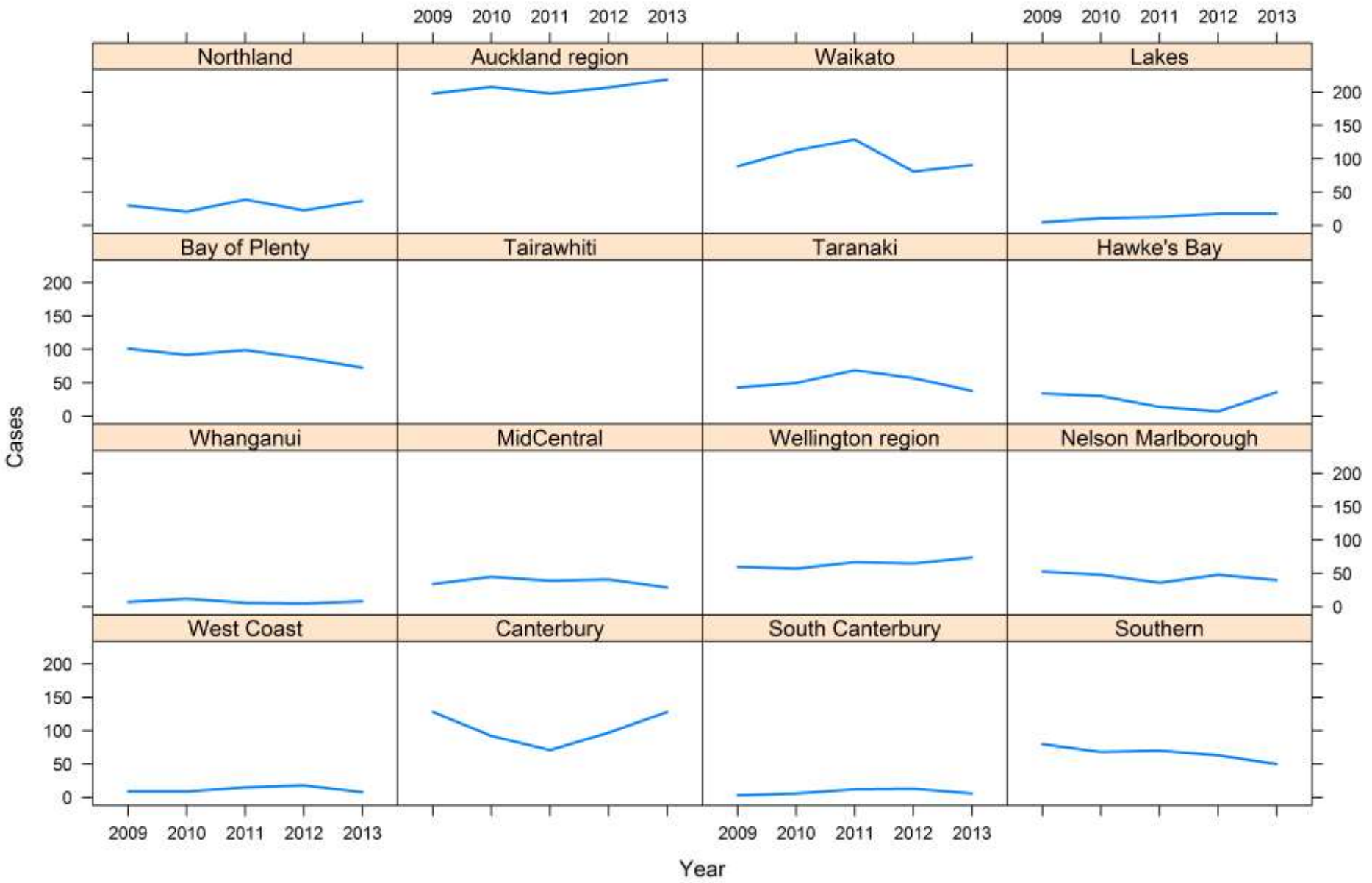
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	37	7	44
Auckland region[a]	219	51	270
Waikato	91	16	107
Lakes	18	-	18
Bay of Plenty	73	7	80
Tairawhiti	-	12	12
Taranaki	38	9	47
Hawke's Bay	36	-	36
Whanganui	8	5	13
MidCentral	29	-	29
Wellington region[b]	74	32	106
Nelson Marlborough	40	33	73
West Coast	8	3	11
Canterbury	128	41	169
South Canterbury	6	6	12
Southern	50	33	83

[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 2009 to 2013 is presented by DHB in Figure 39. Variations are seen among DHBs, for example, there are increasing case numbers over the five-year period in the Auckland region and in Lakes DHB, while decreasing case numbers were seen in Bay of Plenty and Southern DHBs.

Figure 39. Genital herpes case numbers in SHCs by DHB, 2009–2013



* Data was not available for Tairawhiti DHB for 2009–2013.

Sex, age and ethnicity distribution of genital herpes

2013 analysis

Sex was recorded for all cases of genital herpes. More cases of genital herpes were seen in females than males at SHCs (55.6%, 475/855 cases) and at FPCs (76.8%, 196/255) (Table 30). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2013, the male to female ratio of attendees at FPCs was 1:24).

Table 30. Genital herpes (first presentation) cases by sex and clinic type, 2013

Sex	Clinic type	
	SHC	FPC
Male	380	58
Female	475	196
Total	**855**	**255**

Age was recorded for all cases of genital herpes. In SHCs, 38.8% (332/855) of the reported cases of genital herpes were aged less than 25 years. This proportion was larger in FPCs (56.5%, 144/255). The mean age of genital herpes cases was 30.0 years in SHCs and 25.6 years in FPCs.

Across both clinic types, the number of females and males with genital herpes was highest in the 20–24 years age group (139 cases in SHCs and 65 cases in FPCs and 92 cases in SHCs and 21 cases in FPCs, respectively). Figure 40 and Figure 41 present the number of genital herpes cases reported by age group and sex for SHCs and FPCs in 2013.

Figure 40. Number of cases of genital herpes reported by SHCs by age group and sex, 2013

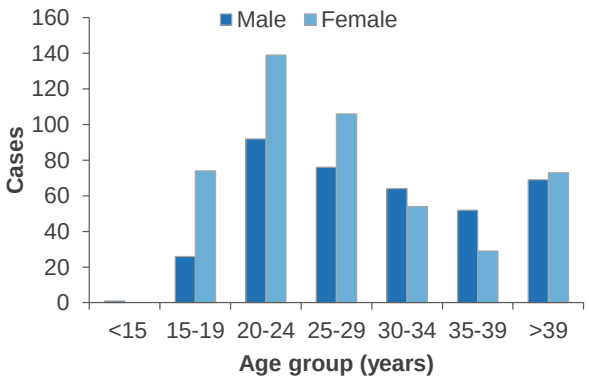


Figure 41. Number of cases of genital herpes reported by FPCs by age group and sex, 2013

Ethnicity was recorded by SHCs for 98.5% (842/855) of the reported cases of genital herpes (Table 31). The highest percentage of cases recorded by SHCs were of European ethnicity (72.7%, 612 cases), followed by Māori (12.5%, 105 cases), Other (11.4%, 96 cases) and Pacific Peoples (3.4%, 29 cases) ethnicity. Ethnicity was recorded by FPCs for 96.9% (247/255) of the reported cases of genital herpes. The highest percentage of cases recorded by FPCs were of European ethnicity (78.5%, 194 cases), followed by Māori (16.2%, 40 cases), Other (4.0%, 10 cases) and Pacific Peoples (1.2%, 3 cases) ethnicity.

Table 31. Genital herpes (first presentation) cases by ethnicity and clinic type, 2013

Ethnicity	Clinic type	
	SHC	FPC
European	612	194
Māori	105	40
Pacific Peoples	29	3
Other	96	10
Unknown	13	8
Total	**855**	**255**

Trends in sex, age and ethnicity

Between 2009 and 2013, the highest number of genital herpes cases in SHCs was seen in both males and females in the 20–24 years age group (Figure 42). A large increase in case numbers occurred in the female 25–29 years age group, while a slightly decreasing or stable trend in case numbers was observed in the other age groups in females. Since 2009 a marked decrease has occurred in case numbers reported by SHCs in females aged 15–19 years. By contrast, a slightly decreasing or stable trend in case numbers was observed in males in all age groups except for a slight increase in the 35–39 years age group.

In FPCs, the highest numbers of genital herpes cases were in females in the 15–19 years and 20–24 years

age groups (Figure 43). Case numbers remained stable over the five-year period for all age groups in males, except for a slightly increasing trend in the 15–19 years age group. For females, there was a large increase in the 25–29 years age group and a decrease in the 15–19 years age group, while a slightly increasing or stable trend in case numbers was observed in the other age groups.

Figure 42. Genital herpes (first presentation) cases in SHCs by sex and age group, 2009–2013

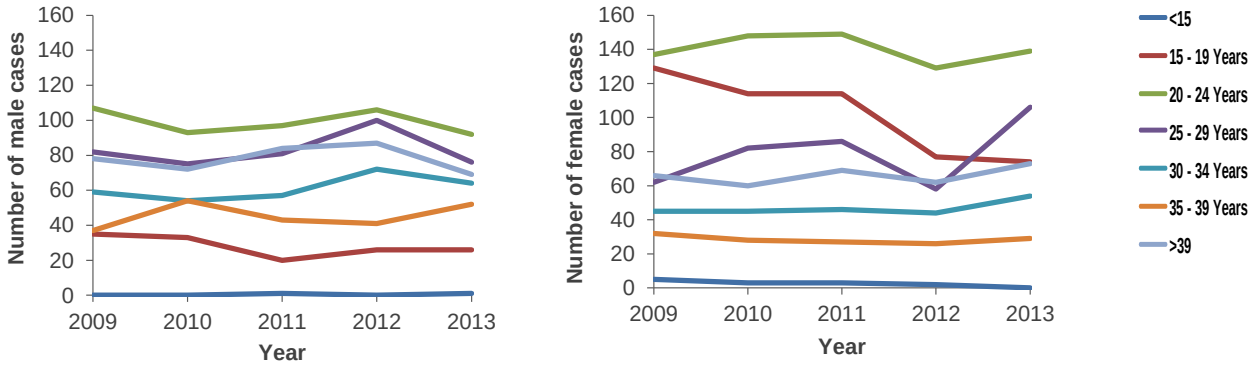


Figure 43. Genital herpes (first presentation) cases in FPCs by sex and age group, 2009–2013

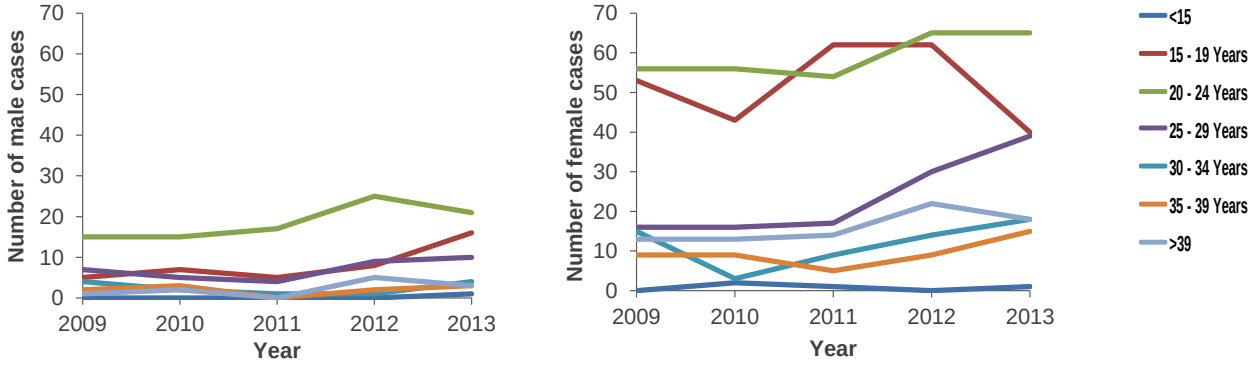


Figure 44 and Figure 45 show the number of first presentations of genital herpes reported from SHCs and FPCs by ethnicity between 2009 and 2013. Cases of genital herpes were substantially more common in those of European ethnicity in both clinic settings over the five-year period. In SHCs, case numbers remained stable in all ethnic groups. In FPCs, case numbers also remained stable in all ethnic groups apart from those in the European ethnicity group which had the largest relative increase (44% from 135 to 194 cases).

Figure 44. Number of genital herpes (first presentation) cases reported from SHCs by ethnicity, 2009-2013

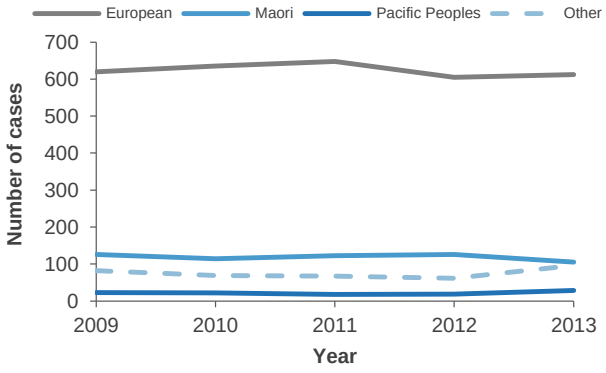
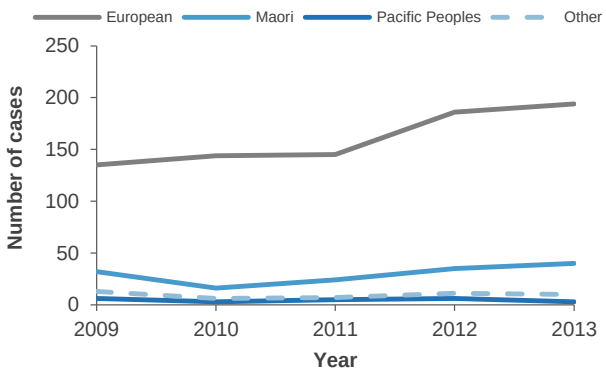


Figure 45. Number of genital herpes (first presentation) cases reported from FPCs by ethnicity, 2009-2013



GENITAL WARTS

GENITAL WARTS (FIRST PRESENTATION)

Key findings

- 2102 first presentations of genital warts were reported in 2013. Of these, 1854 were seen in SHCs.
- Case numbers decreased in SHCs and FPCs between 2012 and 2013.
- Since 2009 a marked decrease has occurred in case numbers reported in females aged 15–19 years.

Genital warts, a visible manifestation of human papillomavirus (HPV) infection, are of particular public health importance because of the 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 [12]. 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 [13]. Immunisation coverage varies by birth cohort with 37% of women born in 1990 estimated to have received three doses of quadrivalent HPV vaccine compared with 50% of girls born in 1999 as of the end of 2012 [14] .

Clinic surveillance of genital warts (first presentation)

National analysis

2013 analysis

In 2013, 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 1854 and 248 cases respectively (Table 32).

Table 32. Genital warts (first presentation) case numbers by clinic type, 2013

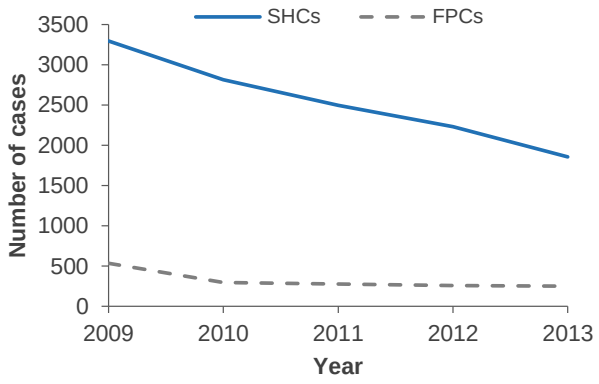
Clinic type	Total number of cases
SHC	1854
FPC	248
Total	**2102**

Trends in national totals

Between 2012 and 2013, genital warts clinic case counts reported by SHCs decreased by 16.8% (from 2229 to 1854 cases) and case counts reported by FPCs by 2.7% (from 255 to 248 cases).

From 2009 to 2013, genital warts clinic case counts reported by SHCs decreased by 43.7% (from 3294 to 1854 cases) and case counts reported by FPCs by 53.4% (from 532 to 248 cases) (Figure 46).

Figure 46. Genital warts (first presentation) cases by clinic type, 2009–2013



DHB counts

2013 analysis

Clinics in 19 DHBs contributed to genital warts surveillance in 2013. The numbers of genital warts cases in each clinic type by DHB are presented in Table 33. The highest number of genital warts in SHCs was seen in the Auckland region (684 cases) and Waikato DHB (189 cases). In DHBs with both SHCs and FPCs, higher genital warts case counts were seen in SHCs.

Table 33. Genital warts (first presentation) case numbers by clinic type and DHB, 2013

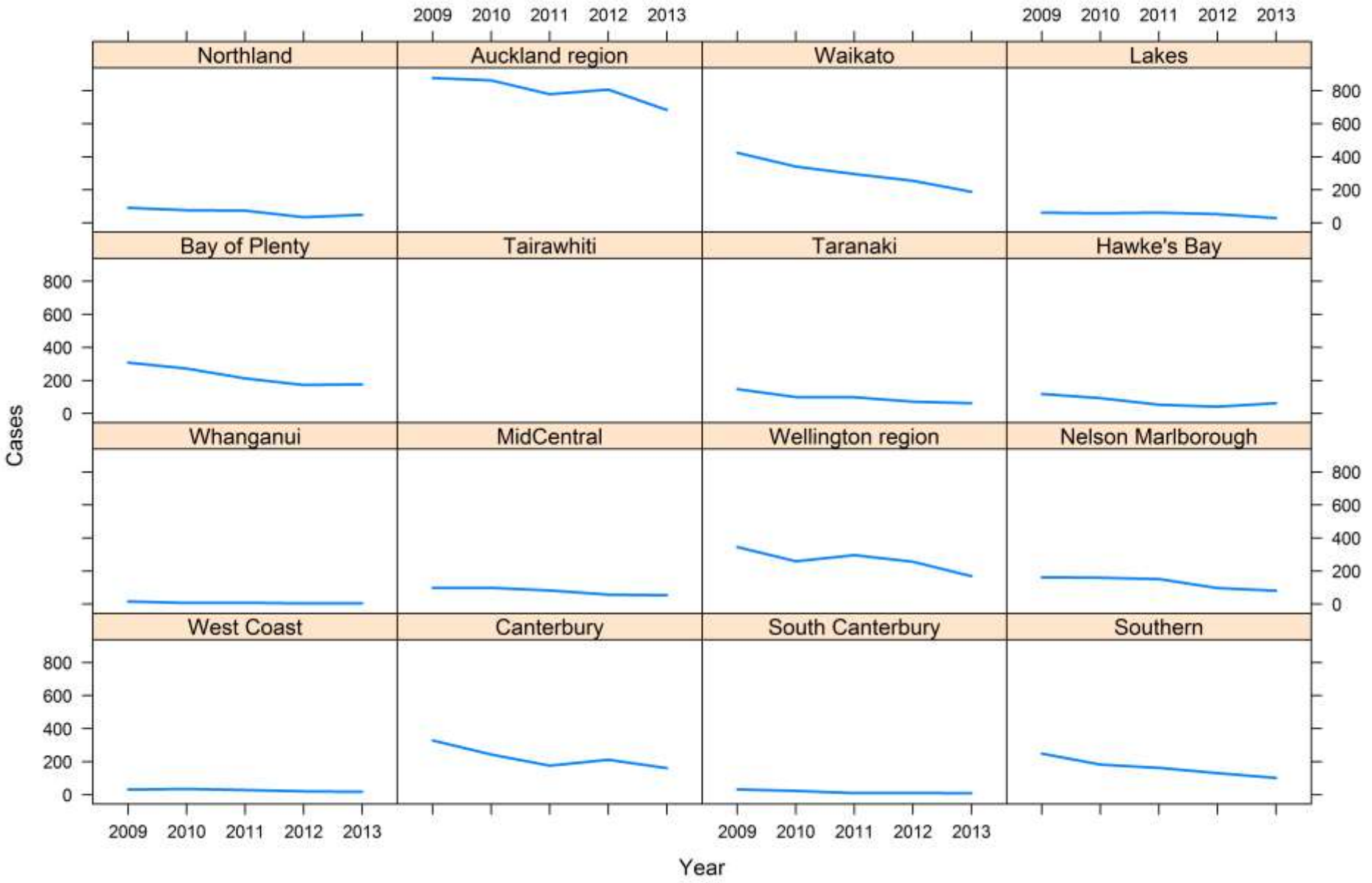
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	49	6	55
Auckland region[a]	684	74	758
Waikato	189	15	204
Lakes	30	-	30
Bay of Plenty	177	8	185
Tairawhiti	-	17	17
Taranaki	63	2	65
Hawke's Bay	63	-	63
Whanganui	6	5	11
MidCentral	54	-	54
Wellington region[b]	169	34	203
Nelson Marlborough	81	17	98
West Coast	18	2	20
Canterbury	161	30	191
South Canterbury	9	1	10
Southern	101	37	138

[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 2009 to 2013 are presented by DHB in Figure 47. SHCs in all DHBs have reported a decrease in the number of cases over the five-year period.

Figure 47. Genital warts case numbers in SHCs by DHB, 2009–2013



Data was not available for Tairawhiti DHB for 2009–2013.

Sex, age and ethnicity distribution of genital warts

2013 analysis

Sex was recorded for all genital warts cases. More cases of genital warts were seen in males than females at SHCs (60.0%, 1113/1854). By contrast, more cases of genital warts were seen in females than males at FPCs (77.0%, 191/248) (Table 34). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2013, the male to female ratio of attendees at FPCs was 1:24).

Table 34. Genital warts (first presentation) cases by sex and clinic type, 2013

Sex	Clinic type	
	SHC	FPC
Male	1113	57
Female	741	191
Total	**1854**	**248**

Age was recorded for all genital warts cases. In SHCs, 38.2% (708/1854) 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 (69.8%, 173/248) than in SHCs. The mean age of cases of genital warts was 29.2 years in SHCs and 23.4 years in FPCs.

In SHCs, the number of cases in males with genital warts was highest in the 25–29 years age group (328 cases) and the number of cases in females was highest in the 20–24 years age group (233 cases). In FPCs, the number of cases in both females and males was highest in the 20–24 years age group (66 and 24, respectively). Figure 48 and Figure 49 present the number of genital warts cases reported by age group and sex for SHCs and FPCs in 2013.

Figure 48. Number of cases of genital warts reported by SHCs by age group and sex, 2013

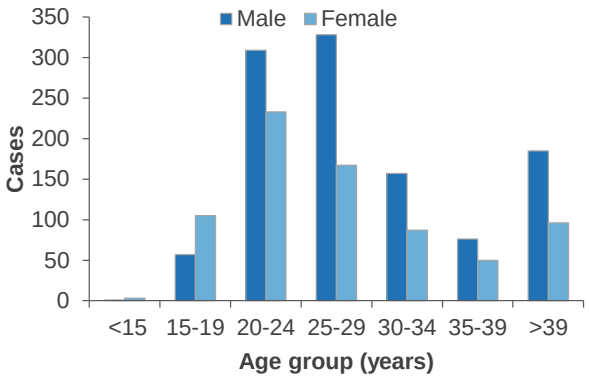
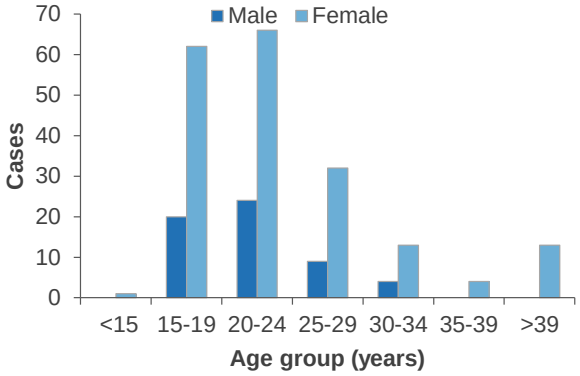


Figure 49. Number of cases of genital warts reported by FPCs by age group and sex, 2013



Ethnicity was recorded by SHCs for 96.3% (1785/1854) of the reported cases of genital warts. The highest percentage of cases reported by SHCs were of European ethnicity (69.7%, 1244 cases), followed by Māori (15.2%, 272 cases), Other (10.9%, 194 cases) and Pacific Peoples (4.2%, 75 cases) ethnicity. Ethnicity was recorded by FPCs for 93.5% (232/248) of the reported cases. The highest percentage of cases reported by FPCs were of European ethnicity (72.0%, 167 cases), followed by Māori (19.0%, 44 cases), Other (5.2%, 12 cases) and Pacific Peoples (3.9%, 9 cases) ethnicity.

Table 35 presents the number of genital warts cases by ethnicity and clinic setting for 2013.

Table 35. Genital warts (first presentation) cases by ethnicity and clinic type, 2013

Ethnicity	Clinic type	
	SHC	FPC
European	1244	167
Māori	272	44
Pacific Peoples	75	9
Other	194	12
Unknown	69	16
Total	**1854**	**248**

Trends in sex, age and ethnicity

Between 2009 and 2013 there was a notable decrease in the genital warts case numbers in SHCs in the 15–19 years and 20–24 years age groups in both males and females (Figure 50). 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 and the 20–24 years age group. Genital warts case numbers also decreased in the 20–24 and 25–29 years age groups in males (Figure 51).

Figure 50. Number of genital warts (first presentation) cases in SHCs by sex and age group, 2009–2013

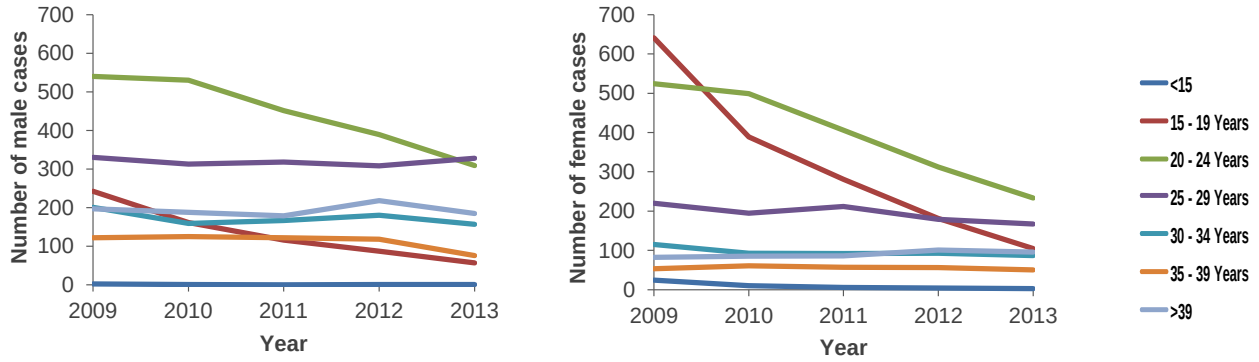


Figure 51. Number of genital warts (first presentation) cases in FPCs by sex and age group, 2009–2013

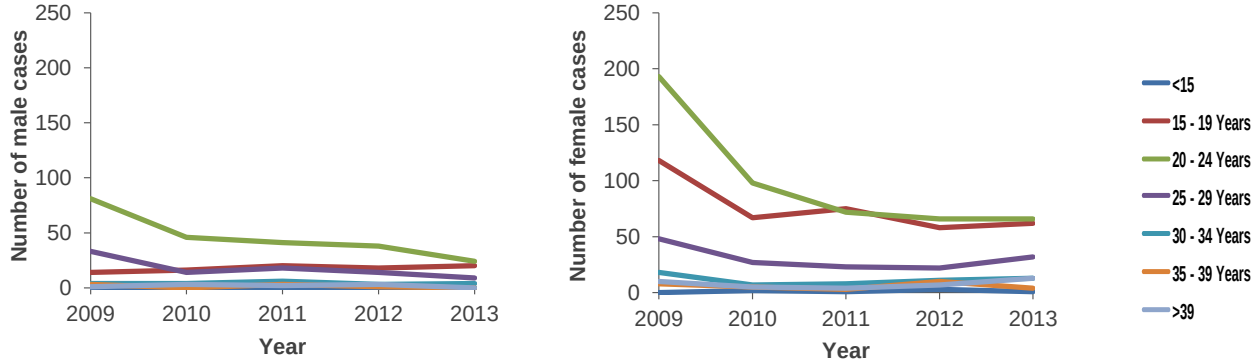


Figure 52 and Figure 53 present genital warts case numbers reported from SHCs and FPCs by ethnicity between 2009 and 2013. In SHCs, there was a decrease in diagnoses in all ethnic groups. In FPCs, the number of diagnoses in every ethnic group decreased between 2009 and 2010 but remained stable in the following years.

Figure 52. Number of genital warts (first presentation) cases reported from SHCs by ethnicity, 2009–2013

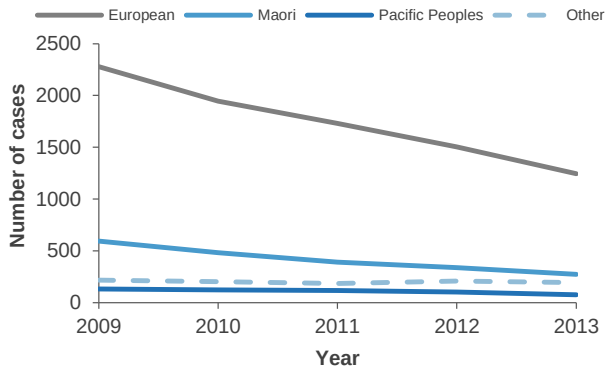
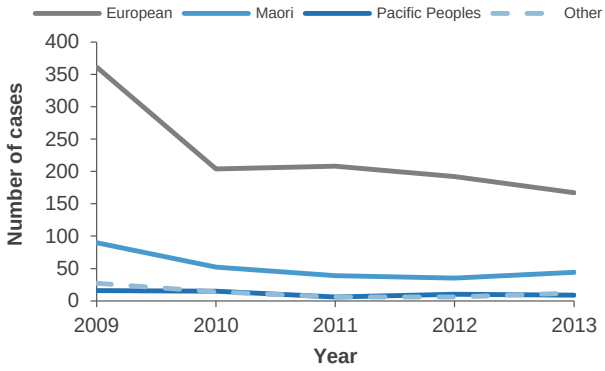


Figure 53. Number of genital warts (first presentation) cases reported from FPCs by ethnicity, 2009–2013



INFECTIOUS SYPHILIS

INFECTIOUS SYPHILIS

Key findings

- 84 syphilis cases were reported in 2013 (81 in SHCs).
- The majority of cases were seen in Auckland (42 cases) and Canterbury (18 cases).
- There has been a steady decline in syphilis cases since a peak of 135 in 2009.
- Males comprised 88.1% of cases.

Infectious syphilis (primary, secondary or early latent) is caused by *Treponema pallidium*. 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. Untreated early syphilis during pregnancy almost always results in perinatal death or congenital infections and complications. In untreated cases, vertical transmission of syphilis, that is, from mother to baby, may occur for at least four years after initial infection, whereas sexual transmission usually occurs during the first year [15]. Only cases of infectious syphilis (primary, secondary and early latent) are reported by clinics for surveillance purposes.

Clinic surveillance of infectious syphilis

National analysis

2013 analysis

In 2013, the number of infectious syphilis cases reported by SHCs and FPCs were 81 and 3 cases respectively (Table 36).

Table 36. Infectious syphilis case numbers by clinic type, 2013

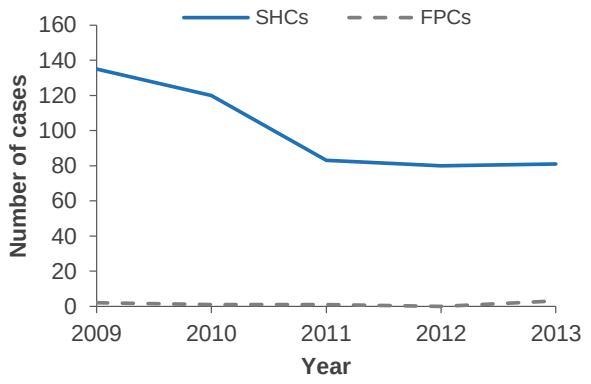
Clinic type	Total number of cases
SHC	81
FPC	3
Total	**84**

Trends in national totals

Between 2012 and 2013, the infectious syphilis case count reported by SHCs increased by 1.3% (from 80 to 81 cases).

From 2009 to 2013, the infectious syphilis clinic case count reported by SHCs decreased by 40.0% (from 135 to 81 cases) (Figure 54).

Figure 54. Infectious syphilis case numbers by clinic type, 2009–2013



DHB counts

2013 analysis

Clinics in 19 DHBs contributed to infectious syphilis surveillance in 2013. The number of infectious syphilis cases seen in SHCs by DHB are presented in Table 37. The highest case numbers of syphilis in SHCs were seen in Auckland (42 cases) region and Canterbury (18 cases) DHB.

Trends in DHB counts

Between 2009 and 2013 SHCs in the Auckland and Wellington regions reported the highest numbers of syphilis cases. Case numbers in the Auckland region peaked in 2010 at 64 cases and have since decreased to 41 cases in 2013. The number of syphilis cases reported in the Wellington region steadily decreased between 2009 and 2013 from 42 to 5 cases. Canterbury reported high case numbers in 2009, 2012 and 2013 (31, 28 and 18 cases, respectively). However, in 2010 and 2011 Canterbury reported relatively few syphilis cases (8 and 3 cases, respectively).

Table 37. Infectious syphilis case numbers in SHCs by DHB, 2013

District Health Board	Cases
Northland	0
Auckland region[a]	41
Waikato	6
Lakes	3
Bay of Plenty	3
Tairawhiti	0
Taranaki	0
Hawke's Bay	0
Whanganui	0
MidCentral	2
Wellington region[b]	5
Nelson Marlborough	0
West Coast	0
Canterbury	18
South Canterbury	0
Southern	3

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

Sex, age and ethnicity distribution of syphilis

2013 analysis

Sex and age was recorded for all cases of infectious syphilis. Of the cases recorded in SHCs, 73 (90.1%) were male and 8 (9.9%) were female. All cases were females in FPCs (Table 38).

Table 38. Infectious syphilis case numbers by sex and clinic type, 2013

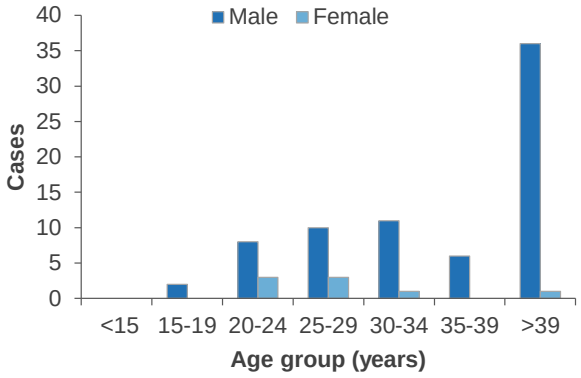
Sex	Clinic type	
	SHC	FPC
Male	73	0
Female	8	3
Total	**81**	**3**

In SHCs, a large proportion (84.0%, 68/81) of the reported syphilis cases were aged 25 years and over, with a mean age of 37.5 years (range: 18–69years).

The number of males with syphilis was highest in the 40 years and over age group (36 cases). For females, syphilis case numbers were low and occurred in the 20–24 years and the 25–29 years age groups (3 cases each), the 30–34 years and 39 years and over age groups (1 case each). Figure 55 presents the number of syphilis cases reported by SHCs by age group and sex for 2013.

In FPCs, two cases were in the 20–24 years age group and one case was in the 15–19 years age group.

Figure 55. Infectious syphilis case numbers reported by SHCs by age group and sex, 2013



Ethnicity was recorded by SHCs for 98.8% (80/81) of the reported cases of syphilis. The highest percentage of cases were of European ethnicity (60.0%, 48 cases), followed by Other (20.0%, 16 cases), and Pacific Peoples and Māori (10.0%, 8 cases each) ethnicity.

Ethnicity was recorded by FPCs for all cases. The cases were of European (2 cases) and Pacific Peoples (1 case) ethnicity (Table 39).

Table 39. Infectious syphilis case numbers by ethnicity and clinic type, 2013

Ethnicity	Clinic type	
	SHC	FPC
European	48	2
Māori	8	0
Pacific Peoples	8	1
Other	16	0
Unknown	1	0
Total	**81**	**3**

Trends in sex, age and ethnicity

Between 2009 and 2013, a notable decrease in the syphilis case numbers in males in the 40 years and over age group in SHCs occurred (from 52 to 36 cases) (Figure 56). During the five-year period, case numbers in females attending SHCs were low compared with males. The highest number of cases in females between 2009 and 2013 was seen in the 40 years and over age group in SHCs.

Figure 57 presents syphilis case numbers reported from SHCs by ethnicity between 2009 and 2013. Between 2009 and 2013 there was a general decrease in case numbers in the European ethnic group (from 70 to 48 cases). Case numbers in Māori have remained low over the five-year period and case numbers in the Pacific Peoples and Other ethnic groups have decreased (from 14 to 8 cases and 33 to 16, respectively).

Figure 56. Number of Infectious syphilis cases in SHCs in males by age group, 2009–2013

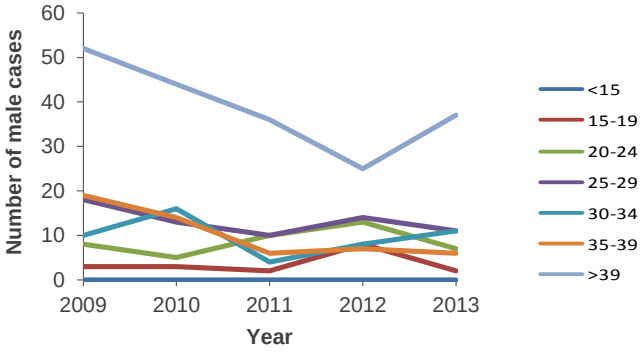
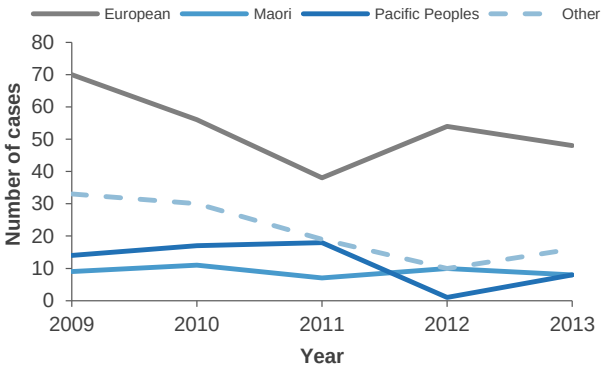


Figure 57. Infectious syphilis case numbers reported from SHCs by ethnicity, 2009–2013



NON-SPECIFIC URETHRITIS

NON-SPECIFIC URETHRITIS

Key findings

- 764 cases of NSU were reported in 2013 – 14 cases seen in FPCs.
- The number of NSU cases seen in SHCs increased by 15.2% from 2012 to 2013.
- The mean age of males with NSU in SHCs was 32.1 years in 2013.

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.

Clinic surveillance of non-specific urethritis

National analysis

2013 analysis

In 2013, the number of NSU cases reported by SHCs and FPCs were 750 and 14 cases respectively (Table 40).

Table 40. NSU case numbers by clinic type, 2013

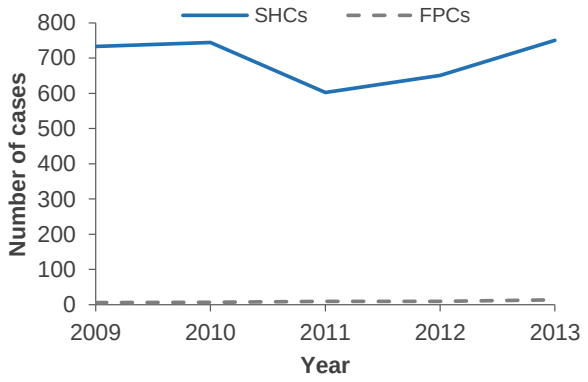
Clinic type	Total number of cases
SHC	750
FPC	14
Total	**764**

Trends in national totals

Between 2012 and 2013, NSU case counts reported by SHCs increased by 15.2% (from 651 to 750 cases) and case counts reported by FPCs by 55.6% (from 9 to 14 cases).

From 2009 to 2013, NSU case counts increased by 2.3% in SHCs (from 733 to 750 cases) (Figure 58). NSU case counts in FPCs have remained low over the five-year period.

Figure 58. NSU cases by clinic type, 2009–2013



DHB counts

2013 analysis

Clinics in 19 DHBs contributed to NSU surveillance in 2013. The number of NSU cases in SHCs by DHB is presented in Table 41. The highest number of cases in SHCs were seen in the Auckland (354 cases) and Wellington (105 cases) regions.

Table 41. NSU case numbers in SHCs by DHB, 2013

District Health Board	Cases
Northland	0
Auckland region[a]	354
Waikato	58
Lakes	0
Bay of Plenty	42
Tairawhiti	0
Taranaki	61
Hawke's Bay	1
Whanganui	0
MidCentral	13
Wellington region[b]	105
Nelson Marlborough	18
West Coast	4
Canterbury	86
South Canterbury	1
Southern	7

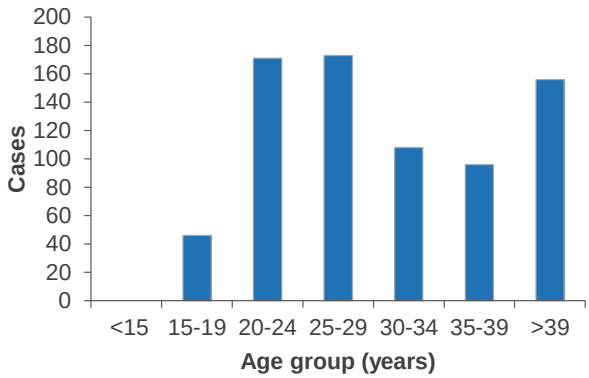
[a] Waitemata, Auckland and Counties Manukau DHBs.
[b] Hutt Valley and Capital & Coast DHBs.

Age and ethnicity distribution of NSU

2013 analysis

Age was recorded for all NSU cases in 2013. In SHCs, 28.9% (217/750) 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 (64.3%, 9/14). The mean age of NSU cases was 32.1 years in SHCs and 24.6 years in FPCs. Figure 59 presents the number of NSU cases reported by age group for SHCs in 2013.

Figure 59. NSU case numbers reported by SHCs by age group, 2013



In SHCs, ethnicity was recorded for 97.1% (728/750) of the reported cases of NSU. The highest percentage of cases were of European ethnicity (69.8%, 508 cases), followed by Other (14.0%, 102 cases), Māori (11.4%, 83 cases) and Pacific Peoples (4.8%, 35 cases) ethnicity (Table 42).

Table 42. NSU cases numbers by ethnicity and clinic type, 2013

Ethnicity	Clinic type	
	SHC	FPC
European	508	12
Māori	83	1
Pacific Peoples	35	0
Other	102	0
Unknown	22	1
Total	**750**	**14**

Trends in age and ethnicity

From 2009 to 2013, case numbers increased in every age group except the 15–19 and 30–34 years age groups, where numbers decreased (from 66 to 46 and 114 to 108 cases, respectively) (Figure 60). Case numbers were very low in the under 15 years age group.

Figure 60. Number of NSU cases in SHCs in males by age group, 2009–2013

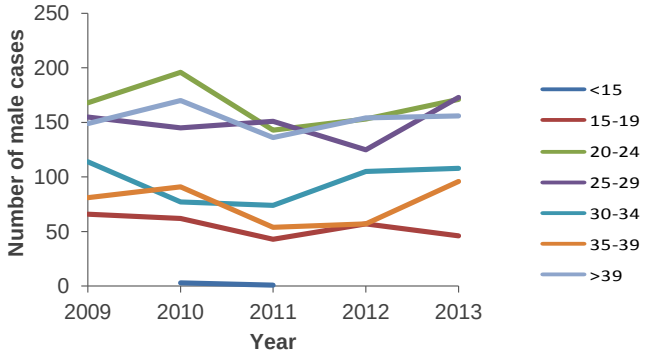
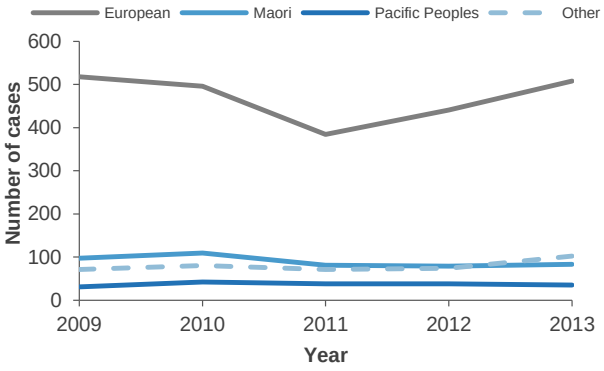


Figure 61 presents NSU case numbers reported from SHCs by ethnicity between 2009 and 2013. Since 2009, case numbers decreased in the European ethnic group (from 518 to 508 cases), and the Māori ethnic group (from 97 to 83 cases). However, case numbers increased in the Pacific Peoples (from 31 to 35 cases) and Other (from 71 to 102 cases) ethnic groups.

Figure 61. Number of NSU cases reported from SHCs, by ethnicity, 2009–2013



DISCUSSION

DISCUSSION

Chlamydia

Chlamydia was the most commonly reported STI in New Zealand in 2013. The laboratory-based estimated national chlamydia rate had been stable between 2009 and 2011 and then decreased in 2012. With laboratories in all DHBs now providing data on chlamydia tests the 2013 chlamydia incidence rate is no longer an estimate and showed a marked decrease. However new data processing methods introduced for collection of 2013 data that allowed for exclusion of repeat tests for an individual within a defined episode period will account for some of this decrease. 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. Overall, 5.8% (1747) of positive specimens were excluded as repeat tests in 2013. It will be interesting to see if the observed decrease continues in future years.

The rate of chlamydia in females in the 15–19 years age group (the group with the highest rate at the national level) has continued to show a steady decline since 2009. Testing rates by age group were able to be calculated for the first time in 2013, which will allow trends in testing by age group to be followed in future reports. The testing rates for the 15–24 years age groups were below the level mathematical modelling has suggested is required to decrease chlamydia prevalence and generally lower than 2012 testing rates for England but higher than that reported from Australia [16-19]. With the inclusion of new DHBs in 2013 there has been a large increase in the number of tests included in the analysis but the testing rate for the total population has remained stable compared with 2012.

Although laboratory-based surveillance showed a decrease in incidence rate in recent years, the chlamydia clinic case numbers reported by SHCs increased by 2.1% between 2012 and 2013. During this time the number of clinic visits only increased by 0.7% which suggests an increased prevalence among those attending the SHCs. During the same period the chlamydia clinic case numbers reported by FPCs decreased by 4.3% and the number of clinic visits decreased by 11.5%, which also suggests an increased prevalence among those attending FPCs.

Gonorrhoea

Although the estimated national rate of gonorrhoea decreased in 2013 from 2012 it remains almost 18% higher than the estimated rates in 2009 after which time nucleic acid amplification testing (NAAT) for gonorrhoea testing was introduced in many laboratories. This decrease was across all age groups and both sexes. The downward trend in gonorrhoea rates previously seen in the Waikato and Bay of Plenty regions was reversed in 2013, most likely due to the introduction of NAAT during 2013. The new data processing methods introduced for collection of 2013 data that allowed 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 between 2012 and 2013. Overall, 21.1% (968) of positive specimens were excluded as they were considered to be repeat tests. This proportion of tests excluded is a lot higher than for chlamydia as some areas were still doing two tests for many cases (culture and NAAT). 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. This data suggests that the increase in the national rate seen from 2009–2012 is likely to be a result of the change in gonorrhoea testing practices leading to increased detection of infections rather than a sudden increase in the overall burden of gonorrhoea, but it is too soon to know if the 2013 decrease will continue.

As in 2012, Tairawhiti DHB stood out with a laboratory-based gonorrhoea rate more than five times the estimated national rate and high case numbers reported by the participating Gisborne clinics relative to the population size. It was not possible to determine potential reasons for the continued high rate in Tairawhiti DHB from the surveillance data.

Although laboratory-based surveillance showed a decrease in incidence rate from 2012 to 2013, the gonorrhoea clinic case numbers reported by SHCs increased by 6.6% between 2012 and 2013. During this time the number of clinic visits only increased by 0.7% which suggests an increased prevalence among those attending the SHCs. During the same period the gonorrhoea clinic case numbers reported by FPCs increased by 21.7% and the number of clinic visits decreased by 11.5%, which also suggests an increased prevalence among those attending FPCs.

In 2012, the World Health Organization released an action plan in response to growing concerns about antimicrobial resistant gonorrhoea, especially emerging resistance to ceftriaxone [20]. No ceftriaxone resistance has been detected among *Neisseria gonorrhoeae* in New Zealand as yet. However, isolates with decreased susceptibility to ceftriaxone have been confirmed from the Auckland region and Waikato DHB. 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.

Genital warts

The decreasing trend in the number of cases of genital warts in both clinic types continued in 2013. This decrease was most notable in females aged 15–19 years, although decreases have also occurred in males in the same age group and in males and females in the 20–24 years age group since 2009. 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 [21]. 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 [22].

Syphilis

Trends in STIs are important because they are a marker for behaviours associated with HIV transmission. In addition, STIs make it easier to transmit and acquire HIV infection. This is particularly true for syphilitic ulcers [23]. In recent syphilis outbreaks overseas, high rates of HIV co-infection were documented, ranging from 20 to 70 percent [24].

The number of cases in Canterbury decreased to 17 from the 28 cases seen in 2012. The surveillance data does not indicate why Canterbury has had a pattern of marked fluctuations in numbers reported since 2009. Overall syphilis case numbers in New Zealand have declined steadily over the last four years.

Syphilis cases diagnosed outside of the participating clinics (eg, general practices, hospitals) are not captured in current syphilis surveillance. Therefore, the syphilis numbers reported here will underestimate the true disease burden.

At-risk groups

As in previous years, those aged less than 25 years showed a disproportionate burden of STIs in 2013. The highest numbers and rates for each STI were consistently in the 15–19 years and 20–24 years age groups, both in the clinic and laboratory surveillance data. The exception to this was syphilis, where the 40 years and over age group had the higher disease burden.

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 had a higher burden of bacterial STIs while those of European ethnicity had a higher burden of viral STIs.

Neonatal chlamydia and gonorrhoea cases continue to occur with laboratory data reporting 84 chlamydia cases and two gonorrhoea cases aged less than one year in 2013. These neonatal infections highlight the need to improve STI screening during pregnancy.

International comparisons

Several factors affect the ability to compare New Zealand STI surveillance data with that reported by other countries.

- The collection methods for STI surveillance data vary widely among countries.
- The number of cases diagnosed in a country will be influenced by local access to health care, local STI screening practices and local laboratory testing methods.

These factors make it difficult to meaningfully compare STI rates between New Zealand and other countries.

The national chlamydia rate for New Zealand in 2013 (633 per 100 000 population) was approximately one and half times higher than the national chlamydia rates most recently published for Australia (355 per 100 000 population in 2012), the United Kingdom (376 per 100 000 population in 2012) and the United States (457 per 100 000 population in 2012). For gonorrhoea, the estimated national rate for New Zealand in 2013 (78 per 100 000 population) was higher than the national rates observed in Australia (59 per 100 000 population in 2012) and the United Kingdom (45 per 100 000 population in 2012), but lower than the rate in the United States in 2012 (106 per 100 000 population [25-27].

STI surveillance system limitations and improvements

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

New data processing methods allowed for removal of repeat tests within in specified timeframe for 2013 data, 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 now provided on negative STI tests has broadened the scope for reporting testing rates and test positivity rates and these were analysed by age and sex in 2013. However it must be noted that the numerator for testing rates was the number of tests in a given population, not individuals and this has been shown to over-estimate testing coverage [28]. It is planned to report on population testing coverage using individuals, as well as number of tests, as numerators in 2014.

Information on the burden of STIs by ethnicity for 2013 relied on count data from clinic sources. However provision of NHI numbers as part of the laboratory data entered and stored on the Sharepoint portal website started in 2013. This was used to retrieve ethnicity information from the Ministry of Health and this will be used for the calculation of chlamydia and gonorrhoea rates by ethnicity in future years.

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 by sexual orientation. Work with some SHCs has been started to enable this data to be collected and reported in 2014. In addition, provision of information on the reason for attendance of FPC cases has been agreed on and the most meaningful way of collecting this to allow for analysis is now under discussion. Both of these improvements will provide an insight into the prevalence of STIs in certain population groups.

Summary

The STI burden in New Zealand is considerable, with young people and those of non-European ethnicities over-represented amongst bacterial STI cases.

In the period 2009 to 2013, decreases were observed for most of the STIs under surveillance. The most noticeable exception is gonorrhoea where a 18% increase in the national estimated 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.

Recent changes to STI surveillance have increased the usefulness of STI surveillance data and other planned changes for 2014 will further enhance this.

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APPENDICES

Appendix A: Clinic visits

Sexual health clinics

SHCs reported 80 016 clinic visits during 2013, 59.1% (47 325 visits) of which were by females. Between 2012 and 2013, the number of clinic visits increased by 0.7% (from 79 430 visits in 2012 to 80 016 visits in 2013).

Where information for age and ethnicity was provided, 44.0% (35 100 visits) were by attendees aged less than 25 years, 60.6% (47 536 visits) were European, 23.0% (18 031 visits) were Māori, 4.7% (3 688 visits) were Pacific Peoples and 11.8% (9246 visits) were of Other ethnicity.

Family planning clinics

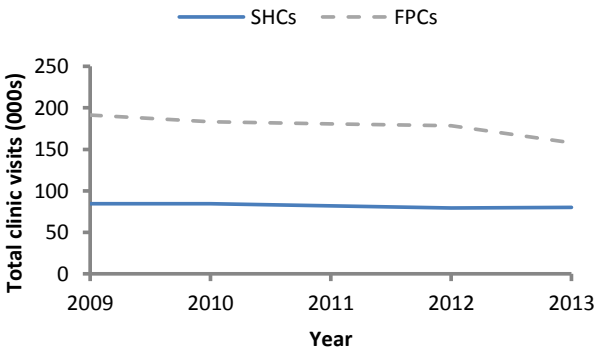
FPCs reported 158 050 clinic visits during 2013, 96.0% (151 669 visits) of which were by females. Between 2012 and 2013, the number of clinic visits decreased by 11.5% (from 178 508 visits in 2012 to 158 050 visits in 2013).

Where information for age and ethnicity was provided, 59.0% (93 237 visits) were by attendees aged less than 25 years, 69.5% (103 802 visits) were European, 16.1% (24 102 visits) were Māori, 4.8% (7 216 visits) were Pacific Peoples and 9.6% (14 287 visits) were of Other ethnicity.

Trends in clinic visits

Over the five-year period between 2009 and 2013 there was stability in the number of clinic visits annually to SHCs and a slight decrease in FPCs.

Figure 62. Total clinic visits by clinic type, 2001–2013



Appendix B: STI surveillance case definitions

Chlamydia	Confirmed	Laboratory 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 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	Infectious syphilis (primary, secondary and early latent) as diagnosed or confirmed by a venereologist, and 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 2013 STI surveillance data was received from the following laboratories:

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

Appendix D: Maps of STI laboratory surveillance coverage for chlamydia and gonorrhoea, 2009–2013

Figure 63. Laboratory surveillance coverage for chlamydia by DHB, 2009–2013

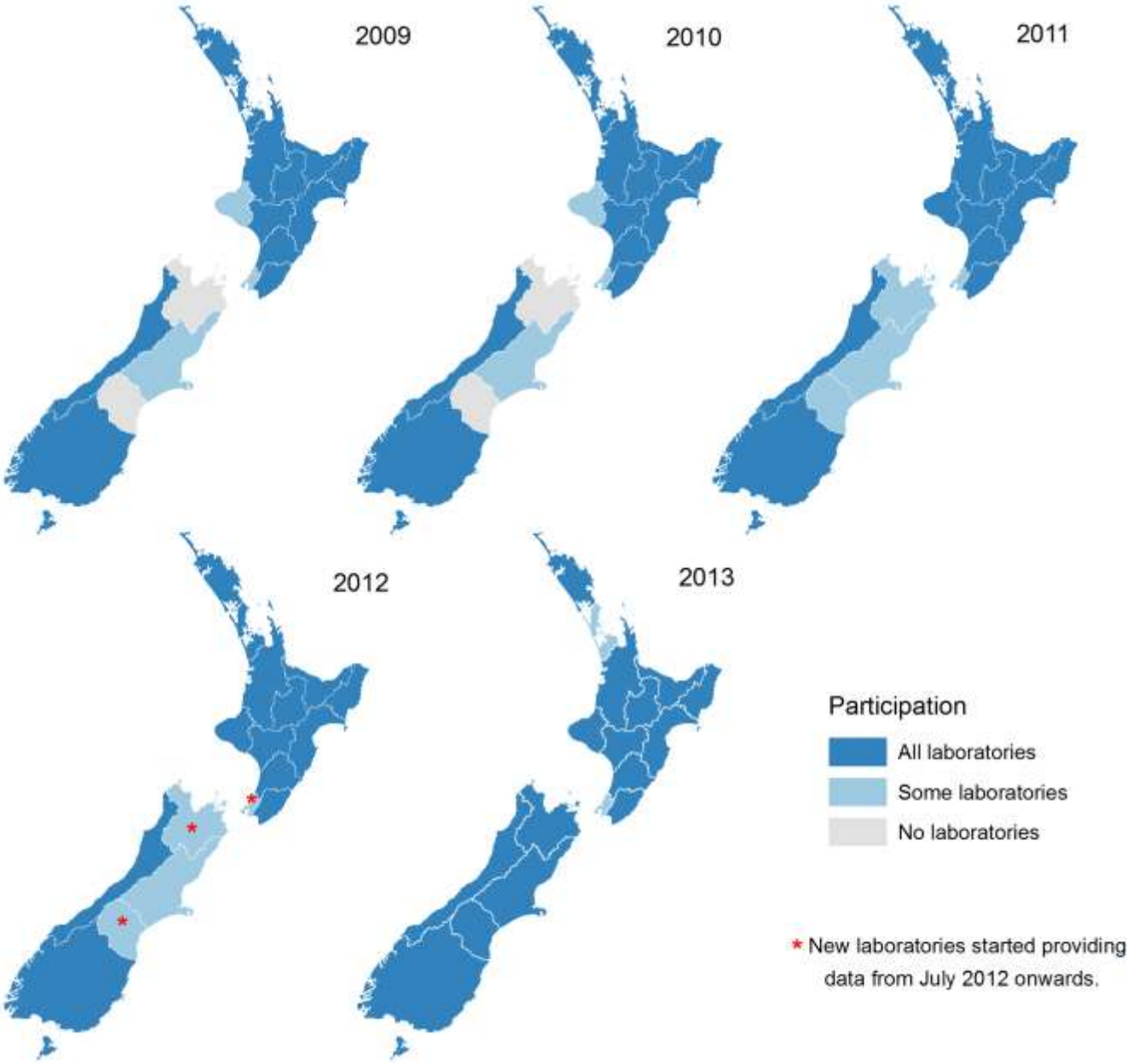


Figure 64. Laboratory surveillance coverage for gonorrhoea by DHB, 2009–2013