ESR

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Sexually transmitted infections in New Zealand

2012

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SUMMARY

SUMMARY

In New Zealand, sexually transmitted infections (STIs) 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 coverage therefore varies with the data source.

This report summarises the surveillance information for STIs in 2012 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 2012, it was estimated that laboratory surveillance reported approximately five and a half-times the number of chlamydia cases and almost five 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). In addition, clinics are currently the only source of information on the distribution of STIs by ethnicity. 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 2012, DHB rates were not calculated for a number of DHBs (5 for chlamydia and 3 for gonorrhoea) due to lack of data.

Chlamydia

Chlamydia was the most commonly reported STI in 2012, in both laboratory and clinic settings. A national estimated chlamydia rate (based on 15 DHBs) of 744 per 100 000 population was calculated from laboratory surveillance data. Seventy percent of cases reported through laboratory surveillance data in 2012 were aged between 15 and 24 years. There were 94 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). Of the 15 DHBs meeting the laboratory selection criteria for analysis in 2012, Tairawhiti, Lakes and Hawke's Bay DHBs reported the highest chlamydia rates.

Laboratory surveillance data showed the estimated national rate of chlamydia (based on 15 DHBs) was stable between 2009 and 2011 but decreased in 2012.

Gonorrhoea

In 2012, a national gonorrhoea rate (based on 17 DHBs) of 89 per 100 000 population was estimated from laboratory surveillance data. Over 60% 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 17 DHBs meeting the laboratory selection criteria for analysis in 2012, Tairawhiti DHB reported the highest gonorrhoea rate – over four times the estimated national rate.

The introduction of testing via nucleic acid amplification tests (NAAT) for gonorrhoea in many regions during 2011 and 2012 impacted on gonorrhoea case numbers. The previously stable estimated national rate increased by about a third in 2012 (based on laboratory data from 17 DHBs).

Syphilis

The number of cases of syphilis reported by SHCs again decreased, from 83 cases in 2011 to 80 cases in 2012. No cases were reported by FPCs. The SHC cases were predominantly male (93.8%) and occurred most commonly in the 40 years and over age group. Seventy two percent of the cases were from the European ethnic group, 13.3% from the Māori ethnic group and 13.3% from the Other ethnic group. Syphilis cases were predominantly reported from clinics in the Auckland region and Canterbury DHB

Other STIs

From 2011 to 2012, SHCs reported a decrease in case counts of genital herpes and genital warts (by 5.4% and 10.5% respectively) and an increase in non-specific urethritis (NSU) case counts (8.1%). The four-year trend showed a decrease across all of these STIs (5.0%, 32.3% and 11.2% respectively).

No cases of chancroid, granuloma inguinale and lymphogranuloma venereum were reported in 2012.

INTRODUCTION

ABOUT THIS REPORT

Last year marked the beginning of a new format for the *Sexually transmitted infections in New Zealand: Annual Surveillance Report*. The change in format was the start of a series of planned improvements to the surveillance of STIs.

One of the most obvious changes to the format is the presentation of surveillance results by disease rather than by reporting source. This supports a new direction where laboratory and clinic surveillance provide complementary information and in combination present a picture of chlamydia and gonorrhoea in New Zealand. Genital herpes, genital warts, syphilis, NSU, chancroid, GI and LGV surveillance continue to be solely clinic based.

STI surveillance through student and youth health clinics was discontinued during 2012. Therefore, the clinic surveillance data reported this year is restricted to data from sexual health and family planning clinics. Surveillance methods and notes for interpreting the results can be found in the appendices.

ESR is continuing work with laboratories and Family Planning to further enhance STI surveillance during 2013. STI surveillance will include data components that allow reporting of diagnosis and overall testing rates by various demographic variables, most notably ethnicity. Gonococcal antimicrobial susceptibility testing data will also be collected and reported routinely. Family Planning clinics will provide indications for STI testing that will allow estimates of STI prevalence in certain population groups to be calculated. All the 2013 surveillance enhancements are being introduced with the highest respect for patient privacy.

In New Zealand, STIs are not notifiable 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 year we would particularly like to acknowledge the past contribution that student and youth health clinics made to STI surveillance between 1998 and 2011.

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.

CHLAMYDIA

CHLAMYDIA

Key findings

- In 2012, the estimated national chlamydia rate was 744 cases per 100 000 population, a decrease from 785 cases per 100 000 population in 2011.
- There were almost three times more female than male laboratory-diagnosed cases of chlamydia in 2012.
- 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.
- 94 cases of laboratory-diagnosed chlamydia were reported in the less than one year age group

In 2012, 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 [1]. 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 [2].

Laboratory surveillance of chlamydia

National and DHB analysis

Annual 2012 analysis

In 2012, 43 laboratories provided chlamydia data. Of these, 35 laboratories from 15 DHBs met the selection criteria for chlamydia reporting (Appendix B). Laboratories in these DHBs reported positive tests from 24 509 patients. The estimated national chlamydia rate, based on 15 DHBs, was 744 per 100 000 population (95% confidence interval (CI) [713, 776]).

Fifteen DHBs met the selection criteria for individual analysis in 2012 (Appendix B). The highest numbers of test-positive chlamydia cases were seen in the Auckland region (10 757 cases) and in Waikato DHB (2693 cases) (Table 1). The highest rate of chlamydia was reported in Tairawhiti DHB (1350 per 100 000, 632 cases), followed by Lakes (1349 per 100 000, 1391 cases) and Hawke's Bay (958 per 100 000, 1489 cases) DHBs.

Table 1: Number of test-positive chlamydia cases and population rates by DHB, 2012

District Health Board	Number of test-positive cases	Rate per 100 000 population
Northland	1291	816
Auckland region[a]	10757	706
Waikato	2693	727
Lakes	1391	1349
Bay of Plenty	1596	752
Tairawhiti	632	1350
Taranaki	655	594
Hawke's Bay	1489	958
Whanganui	522	835
MidCentral	1080	638
Wairarapa	229	564
West Coast	156	474
Southern	2018	656
Other[b]	3812	-
Total[c]	**24509**	**744**

a Waitemata, Auckland and Counties Manukau DHBs

b Data from DHBs where selection criteria were not met

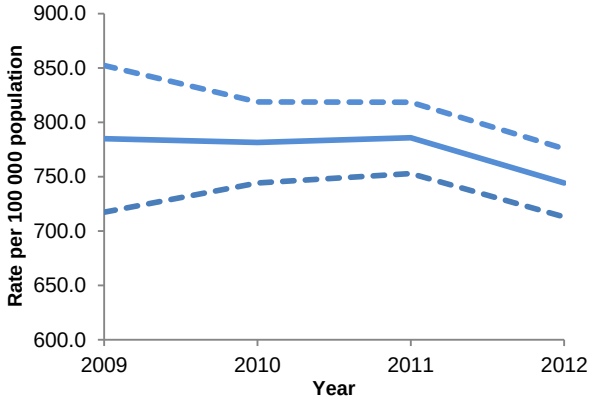
c Total number and rate calculations include only cases and population for DHBs meeting the selection criteria

Trends in laboratory diagnoses

1. National rate trend analysis

Fifteen DHBs met the selection criteria for the estimated national rate trend analysis for chlamydia (Appendix B). Between 2011 and 2012, the chlamydia estimated national rate decreased (from 786 to 744 per 100 000 population). From 2009 to 2012, there was also a decrease in the chlamydia estimated national rate (from 785 to 744 per 100 000 population). The estimated chlamydia national rates from 2009 to 2012, with a 95% confidence interval indicated, are shown in Figure 1.

Figure 1: Estimated national chlamydia rate, 2009–2012



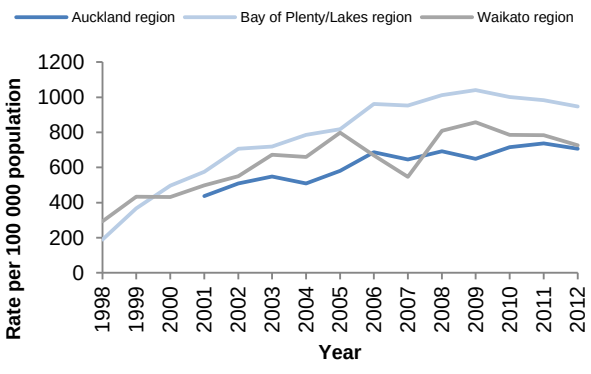
2. Individual DHB trend analysis

Fifteen DHBs met the selection criteria for the individual DHB trend analysis. From 2008 to 2012, the chlamydia rate varied among DHBs and across years (Figure 3). Notable trends over this period are that Lakes, Tairawhiti and Whanganui DHBs experienced increasing rates, while the largest decreases were observed in Bay of Plenty and Taranaki DHBs.

3. Three regions analysis

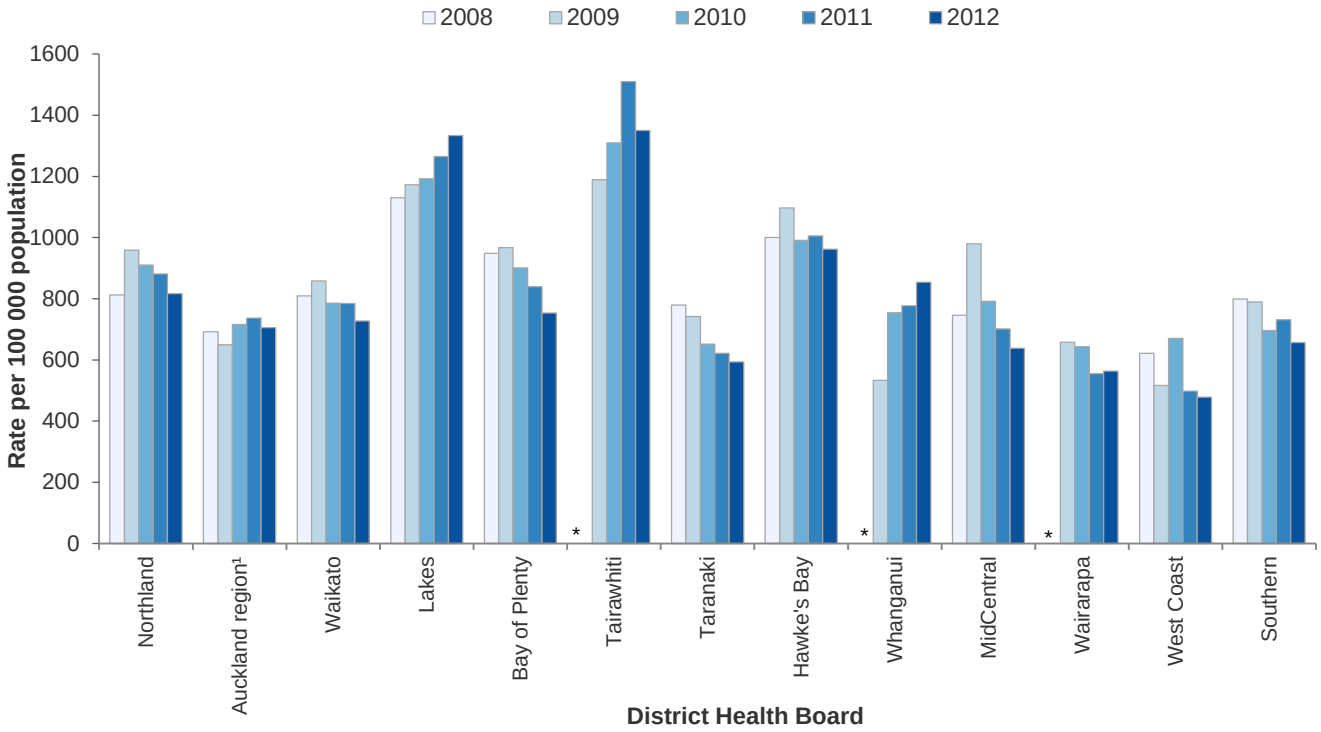
Laboratory data relating to chlamydia has been collected from laboratories in Waikato, Lakes and Bay of Plenty DHBs since 1998 and in the Auckland region since 2001 (Figure 2). Since record collection began, there has generally been an increasing chlamydia rate across these regions. However, since 2009, rates have decreased in the Waikato and Bay of Plenty/Lakes regions (from 858 to 727 per 100 000 and from 1041 to 948 per 100 000 respectively).

Figure 2: Chlamydia rates in selected DHBs, 1998–2012



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

Figure 3: Chlamydia rates by DHB, 2008–2012



[1] Waitemata, Auckland and Counties Manukau DHBs

* Data incomplete.

Age and sex distribution of test-positive cases

2012 analysis

Age and sex information was recorded for 98.9% (24 232/24 509) and 99.8% (24 406/24 509) of test-positive chlamydia cases respectively. The national rate for females (1071 per 100 000 population, 17 925 cases) was over two and a half times the national rate for males (401 per 100 000 population, 6481 cases) (Table 2). The highest rate of chlamydia cases in females was reported for Lakes DHB (2040 per 100 000, 1081 cases), followed by Tairawhiti (1937 per 100 000, 466 cases) and Hawke's Bay (1439 per 100 000, 1145 cases) DHBs. The highest rate of chlamydia in males was reported for Tairawhiti DHB (725 per 100 000, 165 cases), followed by Lakes (602 per 100 000, 309 cases) and Whanganui (503 per 100 000, 151 cases) DHBs.

The mean age of test-positive chlamydia cases was 22.6 years (median age 20 years, range 0–76 years). Seventy percent (17 135) of positive cases were aged 15–24 years. The highest national age-specific rate of test-positive chlamydia for males occurred in the 20–24 years age group (1863 per 100 000 population, 2352 cases). For females, the highest age-specific rate of test-positive chlamydia cases occurred in the 15–19 years age group (6050 per 100 000 population, 6909 cases). The highest DHB age-specific rate was in the 15–19 years age group from Lakes DHB (8575 per 100 000 population, 632 cases). Table 3 presents the number of test-positive chlamydia cases, and chlamydia population rates by DHB and age group for 2012.

Ninety-four test-positive chlamydia cases were reported in the less than one year age group. Age-specific rates by DHB could not be calculated separately for this age group because estimated population data was not available.

Trends in age and sex distribution of chlamydia

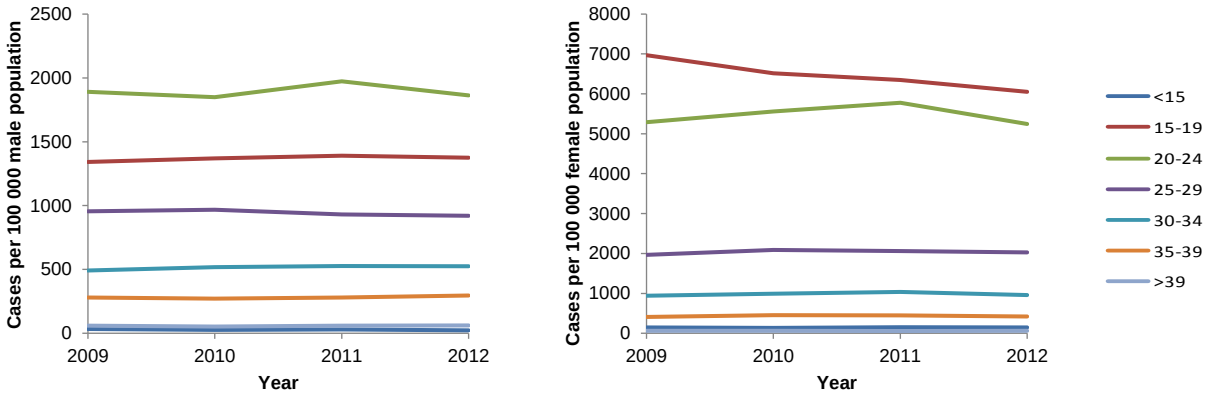
Between 2009 and 2012, the overall distribution of test-positive chlamydia cases by age and sex has remained relatively stable, apart from a steady decrease in rate for females in the 15-19 years age group (from 6970 to 6050 per 100 000, a 13% decrease). Chlamydia rates by age group and sex from 2009 to 2012 are presented in Figure 4.

Table 2: Number of test-positive chlamydia cases and chlamydia rates by DHB and sex, 2012

District Health Board	Number of test-positive cases				Rate per 100 000 population[d]		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	286	1004	1	1291	368	1251	816
Auckland region[a]	2971	7770	16	10757	40	1003	706
Waikato	687	2001	5	2693	377	1066	727
Lakes	309	1081	1	1391	602	2040	1349
Bay of Plenty	417	1120	59	1596	404	1031	752
Tairawhiti	165	466	1	632	725	1937	1350
Taranaki	170	485	0	655	313	867	594
Hawke's Bay	344	1145	0	1489	457	1439	958
Whanganui	151	368	3	522	503	1182	835
MidCentral	321	754	5	1080	389	871	638
Wairarapa	42	187	0	229	211	903	564
West Coast	47	109	0	156	283	680	474
Southern	571	1435	12	2018	375	924	656
Other[b]	1139	2657	16	3812	-	-	-
Total[c]	**6481**	**17925**	**103**	**24509**	**401**	**1071**	**744**

a Waitemata, Auckland and Counties Manukau DHBs
b Data from DHBs where selection criteria were not met
c Total number and rate calculations include only cases and population for DHBs meeting the selection criteria
d Rates have not been calculated where there were fewer than five cases in any category

Figure 4: Chlamydia rates per 100 000 population by age group and sex, 2009–2012



Between 2009 and 2012, the female/male ratio of test-positive chlamydia cases decreased from 3.0 to 2.8. During this period there was a decrease for females in the number of test-positive chlamydia cases (from 18 694 to 17 925 cases), but an increase for males (from 6244 to 6481 cases). The female/male ratio for test-positive cases and the total number of test-positive chlamydia cases from 2009 to 2012 are presented in Figure 5.

Figure 5: Female/male ratio of cases and total number of chlamydia cases, 2009–2012

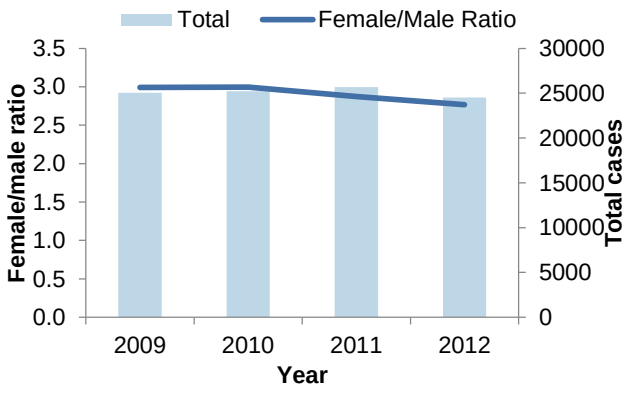


Table 3: Number of test-positive chlamydia cases and chlamydia rates by DHB and age group, 2012

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	6	51	0	-	26	225	630	5974	391	4436	128	1737	58	827	23	274	28	34	1	–	1291	816
Auckland region[a]	65	58	0	-	153	153	3088	2816	3861	3211	1741	1423	841	760	422	403	571	89	15	–	10757	706
Waikato	5	18	0	-	50	195	962	3534	1011	3654	370	1615	158	723	67	310	69	41	1	–	2693	727
Lakes	1	-	0	-	59	770	632	8575	405	5952	154	2571	61	1038	38	599	41	85	0	–	1391	1349
Bay of Plenty	0	-	0	-	53	356	678	4822	505	4138	173	1605	84	777	35	292	44	41	24	–	1596	752
Tairawhiti	1	-	0	-	20	534	273	7879	191	6464	62	2309	30	1250	13	484	15	71	27	–	632	1350
Taranaki	2	-	0	-	5	67	214	2956	186	2698	55	871	27	446	11	169	12	22	143	–	655	594
Hawke's Bay	5	44	3	-	58	514	657	6066	457	4938	146	1834	72	922	39	432	51	67	1	–	1489	958
Whanganui	4	-	0	0	8	192	180	4167	169	4142	53	1669	34	1168	12	379	10	32	52	–	522	835
MidCentral	3	-	3	-	12	108	406	3113	431	3029	125	1222	53	575	24	256	23	29	0	–	1080	638
Wairarapa	0	-	0	-	4	-	112	4358	61	2837	25	1493	12	635	7	317	7	32	1	–	229	564
West Coast	1	-	0	-	1	-	69	3399	54	2903	17	1046	7	412	4	-	3	-	0	–	156	474
Southern	8	42	3	-	8	45	687	3044	825	3067	250	1243	113	615	55	300	57	39	12	–	2018	656
Other[b]	15	–	2	–	47	–	1166	–	1494	–	559	–	247	–	102	–	165	–	13	–	3810	–
Total[c]	**101**	**42**	**9**	**4**	**457**	**208**	**8588**	**3656**	**8547**	**3502**	**3299**	**1478**	**1550**	**751**	**750**	**363**	**931**	**62**	**277**	**–**	**24509**	**744**

a Waitemata, Auckland and Counties Manukau DHBs

b Data from DHBs where selection criteria were not met

c Total number and rate calculations include only cases and populations for DHBs that met the selection criteria

d Rates have not been calculated where there were fewer than five cases in any category

Test positivity rates

2012 analysis

The 35 laboratories (from 15 DHBs) that met the selection criteria (Appendix B) reported testing 292 434 specimens for chlamydia, of which 8.6% (25 177 specimens) tested positive from 24 509 cases. Nationally, 89 chlamydia tests were performed per 1000 population. The specimen counts may include repeat samples from the same individual.

Table 4 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 DHB for 2012.

The highest numbers of tests relative to population size were in Lakes (109 per 1000 population), and Tairawhiti (100 per 1000 population) DHBs, followed by the Auckland region (98 per 1000 population) and Southern (91 per 1000 population) DHB.

Of the specimens tested, Tairawhiti DHB had the highest percentage of positive tests for chlamydia (13.9%), followed by Whanganui (13.1%) and Hawke's Bay (12.7%) DHBs. The Auckland region and Southern DHB had the lowest percentages of positive tests (7.5% and 7.3% respectively).

Trends in test positivity

Fifteen DHBs met the criteria (Appendix B) for trend analysis of test positivity rates (Figure 6). Between 2009 and 2012, the percentage of positive results recorded for all specimens tested for chlamydia decreased slightly from 9.4% to 8.6%. During this period, there was also a small increase in the number of specimens tested for chlamydia each year, from 286 309 specimens in 2009 to 292 434 specimens in 2012 (2% increase).

Figure 6: Percentage of positive specimens tested and total specimens tested for chlamydia, 2009–2012

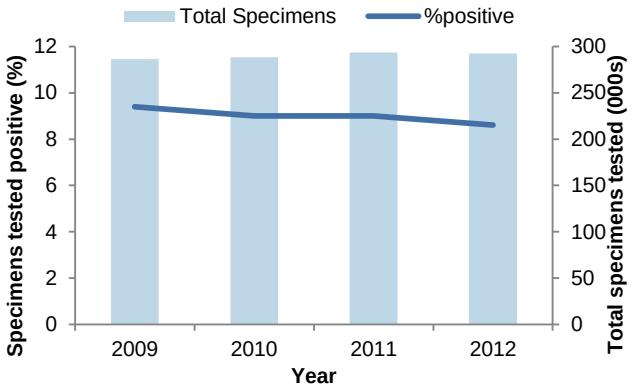


Table 4: Number of specimens tested for chlamydia, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases, by DHB, 2012

District Health Board	Total specimens	Tests per 1000 population	Specimens tested positive (%)	Number of laboratory-confirmed cases
Northland	11801	75	11.0	1291
Auckland region[a]	149037	98	7.5	10757
Waikato	29076	79	9.3	2693
Lakes	11379	110	12.2	1391
Bay of Plenty	17448	82	9.2	1596
Tairawhiti	4700	100	13.9	632
Taranaki	9541	86	8.3	655
Hawke's Bay	11889	77	12.7	1489
Whanganui	4190	67	13.1	522
MidCentral	11316	67	9.7	1080
Wairarapa	2239	55	10.5	229
West Coast	1922	58	8.4	156
Southern	27896	91	7.3	2018
Other[b]	55949	-	7.1	3812
Total[c]	**292434**	**89**	**8.6**	**24509**

a Waitemata, Auckland and Counties Manukau DHBs

b Data from DHBs where selection criteria were not met

c Total includes only cases and population for DHBs meeting the selection criteria

Specimen site

2012 analysis

The site from which the specimen was taken was recorded for 97.3% (16 720/17 178 specimens) of positive specimens, based on chlamydia data from 23 laboratories. In females, the most common specimen site was the cervix (63.7%, 8022/12 595 positive specimens). In males, the most common specimen site was urine (79.9%, 3297/4125 positive specimens). The number of positive specimens from non-urogenital sites remains comparatively low (150/4125 3.6% for males, and 1132/12 595 9.0% for females). A total of 76 positive specimens were from the eye, of these 53 (69.7%) were from patients aged less than 1 year.

Trends in specimen site

Figure 7 and Figure 8 present the specimen site of positive chlamydia tests for males and females, expressed as counts of the total number of positive specimens reported by laboratories meeting the selection criteria (see Appendix B) between 2009 and 2012. In males, there was a decrease in the number of positive specimens from urethral and penile sites (from 1030 to 644 and 77 to 34 specimens, respectively) and an increase in positives from urine samples (from 2741 to 3297 tests). In females, there was also a decline in positives from urethral sites but cervical and urine positives also declined over this period. In contrast, there was an increase in the diagnosis of chlamydia through vaginal samples (from 1257 to 1623 specimens).

Table 5: Count of positive chlamydia tests by specimen site and sex, 2012

Specimen site	Sex	
	Male	Female
Urethral	644	153
Vaginal	-	1623
Cervix	-	8022
Penile	34	-
Anorectal	21	14
Eye	25	51
Urine	3297	1665
Throat	0	0
Other	104	1067
Unknown	179	279

Figure 7: Specimen site, all positive chlamydia tests in males, 2009-2012

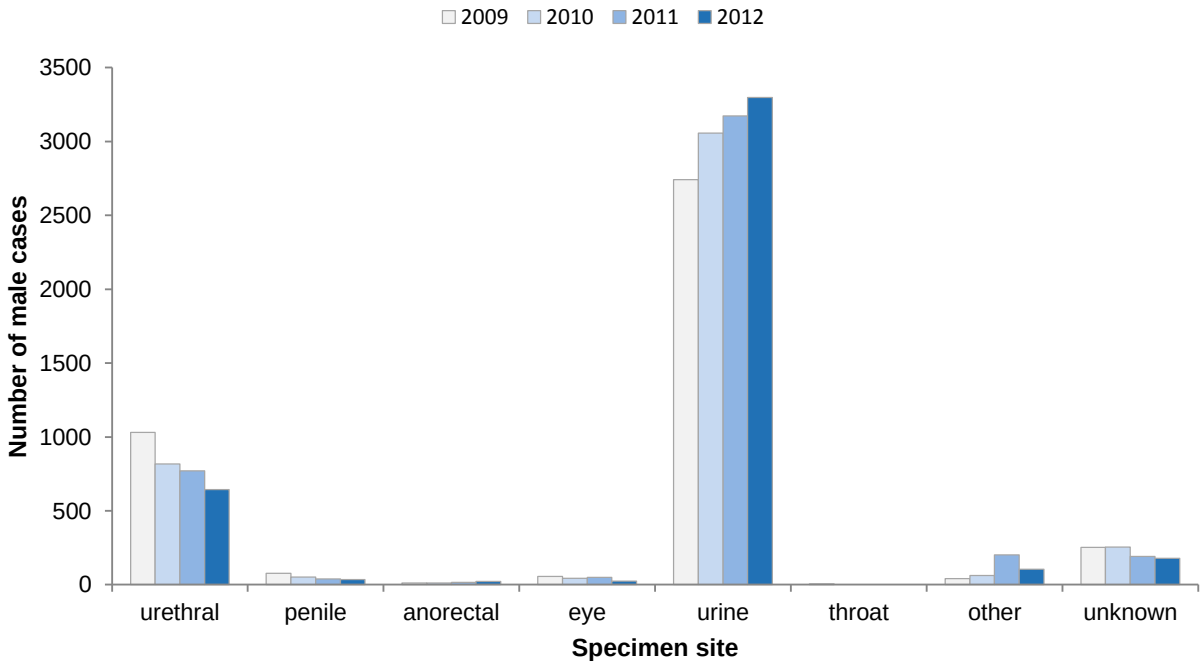
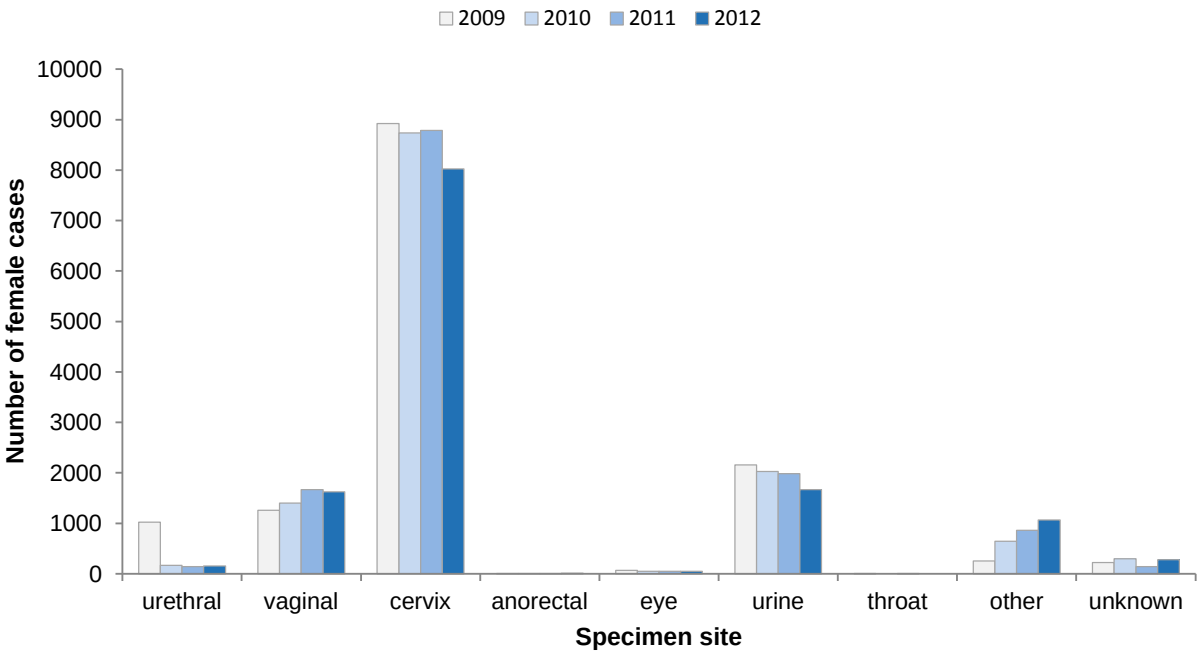


Figure 8: Specimen site, all positive chlamydia tests in females, 2009-2012



Clinic surveillance of chlamydia

National analysis

2012 analysis

In 2012, the numbers of chlamydia cases reported by SHCs and FPCs were 4869 and 2863 cases respectively (Table 6).

Table 6: Chlamydia case numbers by clinic type, 2012

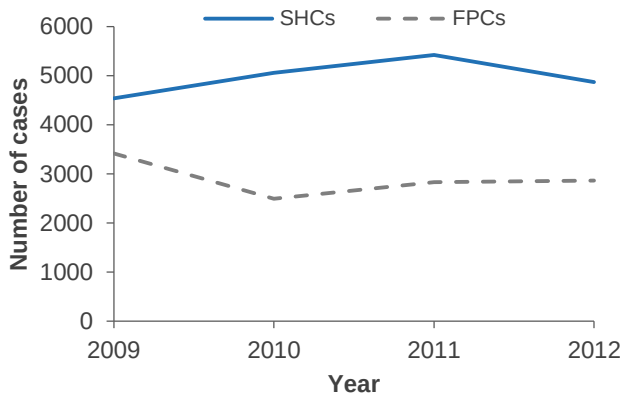
Clinic type	Total number of cases
SHC	4869
FPC	2863
Total	**7732**

Trends in national totals

Between 2011 and 2012, chlamydia clinic case numbers reported by SHCs decreased by 10.2% (from 5420 to 4869 cases). By contrast, chlamydia clinic case numbers reported by FPCs increased by 1.3% (from 2827 to 2863 cases).

From 2009 to 2012, chlamydia case numbers reported by SHCs increased by 7.3% (from 4536 to 4869) (Figure 9). By contrast, the number of chlamydia cases reported by FPCs decreased by 16.1% (from 3412 to 2863 cases) from 2009 to 2012.

Figure 9: Chlamydia cases numbers by clinic type, 2009–2012



DHB counts

2012 analysis

Clinics in 19 DHBs contributed to chlamydia surveillance in 2012. The numbers of chlamydia cases in each clinic type by DHB are presented in Table 7. The highest case numbers of chlamydia in SHCs were seen in Auckland region (1551 cases) and Bay of Plenty DHB (677 cases).

Table 7: Chlamydia case numbers by clinic type and DHB, 2012

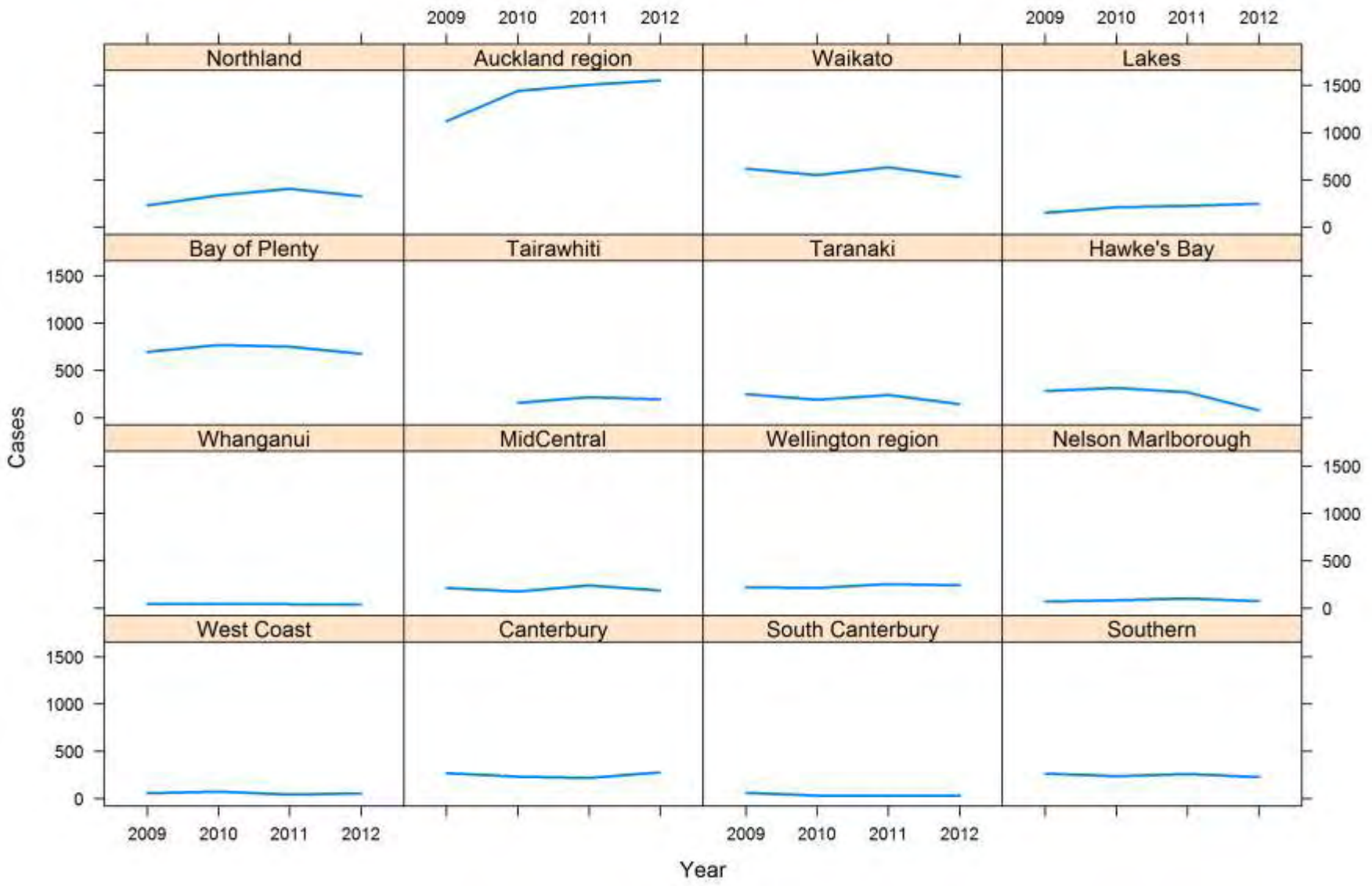
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	329	162	491
Auckland region[a]	1551	794	2345
Waikato	533	455	988
Lakes	249	0	249
Bay of Plenty	677	96	773
Tairawhiti	191	148	339
Taranaki	144	29	173
Hawke's Bay	79	0	79
Whanganui	34	23	57
MidCentral	183	0	183
Wellington region[b]	241	348	589
Nelson Marlborough	74	305	379
West Coast	54	16	70
Canterbury	276	224	500
South Canterbury	28	26	54
Southern	226	237	463

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 2012 are presented by DHB in Figure 10. Variations are seen in trends by DHB. For example, in the Auckland region, increasing case numbers are seen over the four-year period, while decreasing case numbers were seen in Taranaki and Hawke's Bay DHBs.

Figure 10: Chlamydia case numbers in SHCs by DHB, 2009–2012



* Data was not available for Tairawhiti DHB for 2009

Sex, age and ethnicity distribution of chlamydia cases

2012 analysis

Sex was recorded for 99.9% (7726/7732) of chlamydia cases in 2012. 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 2012, the male to female ratio of attendees at FPCs was 1:25). Table 8 presents the number of cases of chlamydia by sex and clinic type for 2012.

Table 8: Number of cases of chlamydia by sex and clinic type, 2012

Sex	Clinic type	
	SHC	FPC
Male	2279	424
Female	2586	2438
Total	**4869**	**2863**

Age was recorded for all except three of the chlamydia cases in 2012. A large proportion of the reported cases of chlamydia were aged less than 25 years: 65.1% (3169/4866) in SHCs and 84.5% (2418/2863) in FPCs. The mean age of chlamydia cases was 24.1 years in SHCs and 20.7 years in FPCs.

The number of males with chlamydia was highest in the 20–24 years age group across both clinic types – 821 cases (36.0%) in SHCs and 195 cases (46.0%) in FPCs. For females, chlamydia case numbers were highest in the 15–19 years age group across both clinic types – 1043 cases (40.3%) in SHCs and 1148 cases (47.1%) in FPCs. Figure 11 and Figure 12 present the clinic visit counts by age group and sex reported by SHCs and FPCs in 2012.

Figure 11: Confirmed chlamydia cases reported by SHCs by age group and sex, 2012

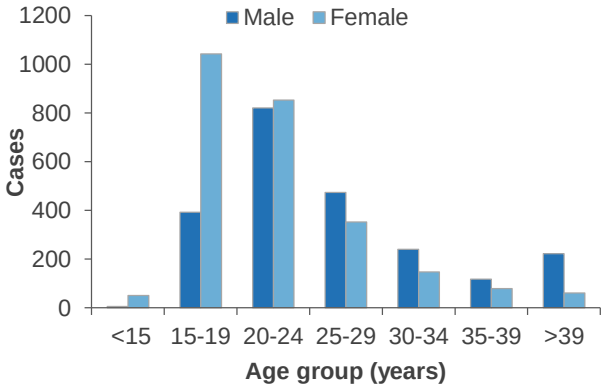
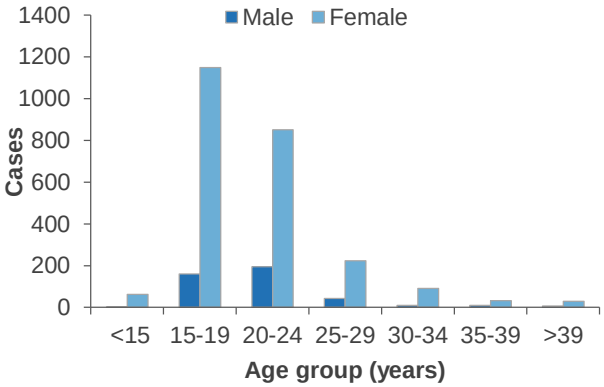


Figure 12: Confirmed chlamydia cases reported by FPCs by age group and sex, 2012



Ethnicity was recorded by SHCs for 98.5% (4794/4869) of the reported chlamydia cases (Table 9). The highest percentage of chlamydia cases reported by SHCs were of European ethnicity (42.7%, 2047 cases), followed by Māori (40.2%, 1929 cases), Pacific Peoples (10.1%, 486 cases) and Other (6.9%, 332 cases) ethnicity. Ethnicity was recorded by FPCs for 95.9% (2745/2863) of the reported chlamydia cases. The highest percentage of chlamydia cases reported by FPCs were of European ethnicity (51.6%, 1417 cases), followed by Māori (33.7%, 926 cases), Pacific Peoples (10.8%, 296 cases) and Other (3.9%, 106 cases) ethnicity.

Table 9: Confirmed chlamydia cases by ethnicity and clinic setting, 2012

Ethnicity	Clinic type	
	SHC	FPC
European	2047	1417
Māori	1929	926
Pacific Peoples	486	296
Other	332	106
Unknown	75	118
Total	**4869**	**2863**

Trends in sex, age and ethnicity

Between 2009 and 2012, 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 393 and 1220 to 1043 cases respectively) whilst they increased in 20–24 years (from 760 to 821 and 733 to 853 cases respectively) and 30–34 years (191 to 241 and 103 to 147 respectively) age groups (Figure 13).

A different trend is seen in FPCs where case numbers in the 15–19 years age group increased between 2009 and 2012 in males and females (Figure 14). For the other age groups case numbers have decreased or remained stable.

Figure 13: Chlamydia case numbers in SHCs by sex and age group, 2009–2012

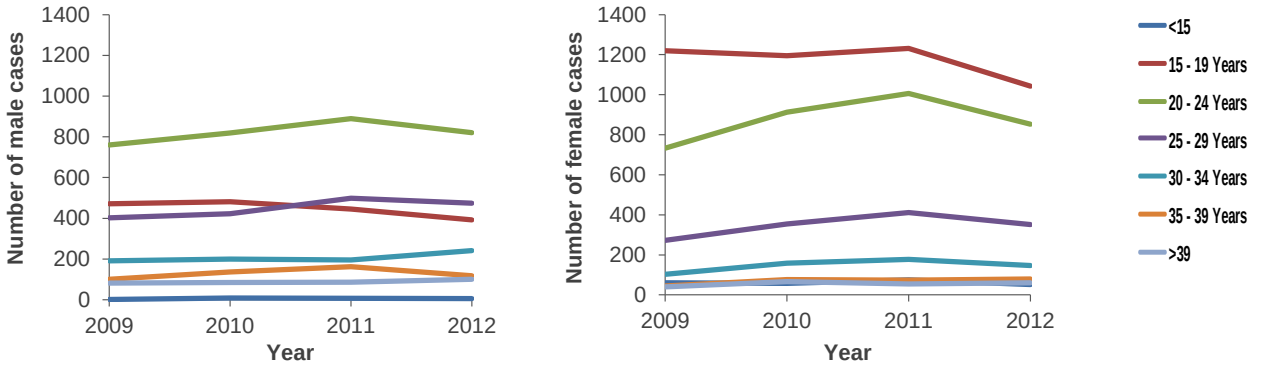
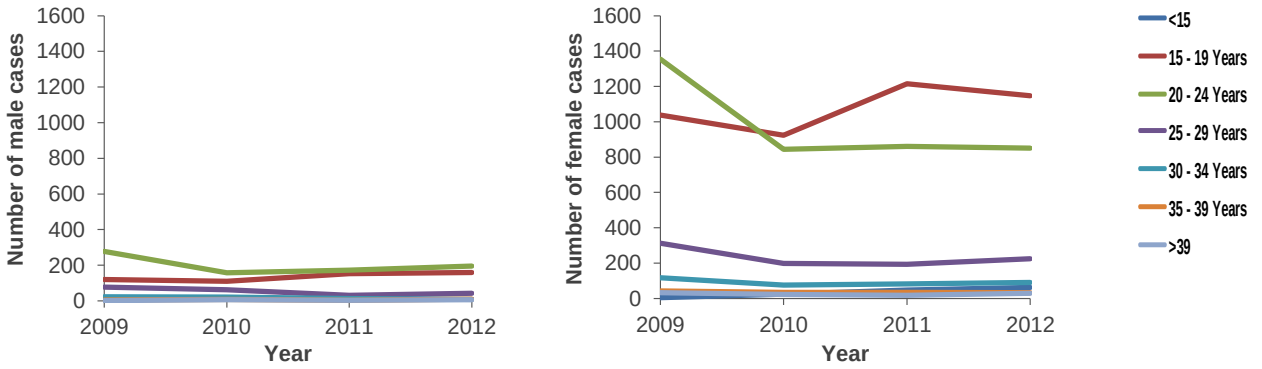


Figure 14: Chlamydia case numbers in FPCs by sex and age group, 2009–2012



In SHCs, there was an increase in the number of people diagnosed with chlamydia in all ethnic groups between 2009 to 2012, except those of European ethnicity (Figure 15). In FPCs, there was a decrease in the numbers of people diagnosed with chlamydia in all ethnic groups between 2009 and 2012 (Figure 16).

Figure 15: Chlamydia case numbers reported from SHCs by ethnicity, 2009–2012

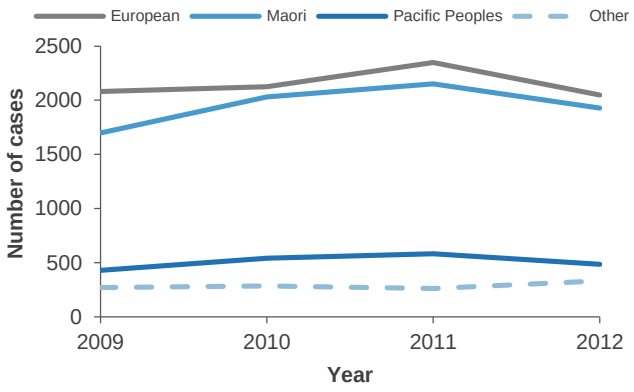
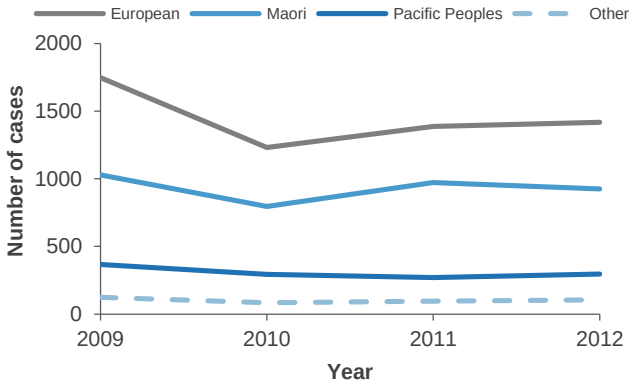


Figure 16: Chlamydia case numbers reported from FPCs by ethnicity, 2009–2012



Site of infection

2012 analysis

In 2012, chlamydia cases were most commonly confirmed from a sample taken at a urogenital site in both clinic types, with 94.7% of SHC cases (4613 cases) and 97.5% of FPC cases (2792).

Table 10 presents the number of confirmed chlamydia cases by site of infection and clinic setting for 2012.

Table 10: Chlamydia case numbers by site of infection and clinic setting, 2012

Site	Clinic type	
	SHC	FPC
Urogenital	4613	2792
PID/epididymitis	240	74
Other site	21	3
Total	**4869**	**2863**

Complicated infections

2012 analysis

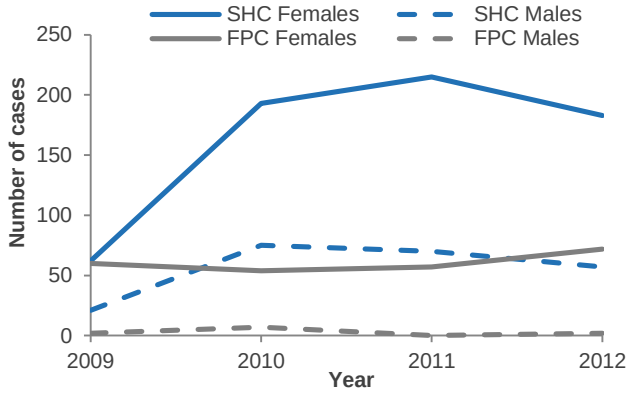
Complicated infections (epididymitis in males and PID in females) were reported for 4.9% (240/4869) of chlamydia cases in SHCs and 2.6% (74/2863) of cases in FPCs. A total of 59 males (57 in SHCs and 2 in FPCs) were reported with epididymitis, with 45.8% (27 cases) aged less than 25 years.

Ethnicity was recorded for all male epididymitis cases. The highest percentage of cases were of European ethnicity (61.0%, 36 cases), followed by Māori (20.3%, 12 cases), Pacific Peoples (11.9%, 7 cases) and Other (6.8%, 4 cases) ethnicity. A total of 255 females (183 in SHCs and 72 in FPCs) were reported with PID, with 71.4% (182 cases) aged less than 25 years. Of the 252 cases (98.8%) where ethnicity was recorded, the highest percentage of cases were of European ethnicity (43.7%, 110 cases), followed by Māori (39.7%, 100 cases), Pacific Peoples (10.3%, 26 cases) and Other (6.3%, 16 cases) ethnicity.

Trends in complicated infections

Figure 17 presents the number of epididymitis cases in males and PID cases in females reported by SHCs and FPCs from 2009 to 2012. Notably, the numbers of complicated infections seen in SHCs have more than doubled in both females and males (62 to 183 cases and 21 to 57 cases, respectively). There has been little change in the numbers of complicated infections seen in FPCs.

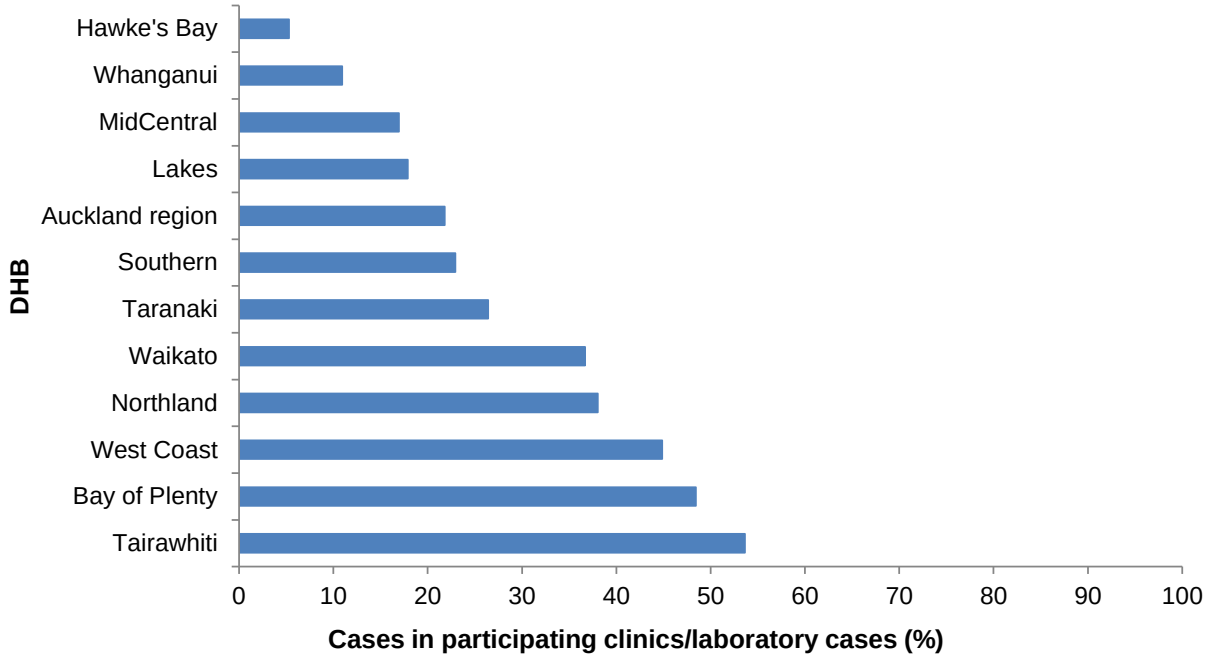
Figure 17: Numbers of epididymitis cases in males and PID cases in females by clinic type, 2009–2012



Comparison of laboratory and clinic surveillance

For DHBs that meet the selection criteria for chlamydia laboratory reporting (Appendix B) and have clinics that participate in the STI surveillance programme, clinic cases as a proportion of laboratory cases are presented in Figure 18. Chlamydia cases not found in the participating clinics are most likely to have been diagnosed in primary care. The highest proportion of chlamydia cases seen in a participating clinic was in Tairawhiti (53.6%), followed by Bay of Plenty (48.4%) and West Coast (44.9%) DHBs. The lowest proportion of chlamydia cases seen in a participating clinic were in Hawke's Bay (5.3 %) and Whanganui (10.9 %) DHBs.

Figure 18: Cases of chlamydia seen in participating clinics as a proportion (%) of all positive laboratory tests, by DHB, 2012



GONORRHOEA

GONORRHOEA

Key findings

- In 2012, the estimated national gonorrhoea rate was 89 cases per 100 000 population.
- The 2012, the estimated national gonorrhoea rate was about a third higher than the rate during the period 2009 to 2011 following the introduction of testing via nucleic acid amplification tests (NAAT) in many regions during 2011 and 2012.
- The highest gonorrhoea rate was seen in Tairawhiti DHB, 408 cases per 100 000 population, more than 4.5 times the estimated national rate.
- The national rate for males and females was similar (90 and 86 per 100 000 population respectively).
- For both males and females, gonorrhoea rates increased for most age groups in 2012 but the increase 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 are being diagnosed via urine specimens in both males and females.
- The number of anorectal and pharyngeal gonorrhoeal infections diagnosed in men at SHCs doubled and tripled respectively between 2009 and 2012.
- *N. gonorrhoeae* isolates with reduced susceptibility to ceftriaxone were identified in the Auckland region in 2011.

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 [3]. Untreated gonococcal infection may be associated with long-term serious sequelae, including PID in females, epididymo-orchitis in males and severe conjunctivitis in neonates [2].

Laboratory surveillance of gonorrhoea

National and DHB analysis

2012 analysis

In 2012, 42 laboratories provided gonorrhoea data. Of these, 36 laboratories from 17 DHBs met the selection criteria for gonorrhoea reporting (Appendix B). Laboratories in these DHBs reported positive tests from 3317 patients. The estimated national gonorrhoea rate, based on 17 DHBs, was 89 per 100 000 population (95% CI [76,101]).

Seventeen DHBs met the selection criteria for individual analysis in 2012 (Appendix B). The highest numbers of test-positive gonorrhoea cases were seen in the Auckland region (1783 cases) and Hawke's Bay DHB (270 cases). There was wide variation in the population rates by DHB from 408 per 100 000 population in Tairawhiti DHB to 24 per 100 000 population in Taranaki DHB (Table 11).

Table 11: Number of gonorrhoea test-positive cases and population rates by DHB, 2012

District Health Board	Number of test-positive cases	Rate per 100 000 population[e]
Northland	173	109
Auckland region[a]	1783	117
Waikato	185	50
Lakes	104	100
Bay of Plenty	97	46
Tairawhiti	191	408
Taranaki	26	24
Hawke's Bay	270	174
Whanganui	38	62
MidCentral	68	40
Wellington region[b]	206	47
Wairarapa	14	34
West Coast	4	-
Southern	158	51
Other[c]	179	-
Total[d]	**3317**	**89**

a Waitemata, Auckland and Counties Manukau DHBs

b Hutt Valley and Capital & Coast DHBs

c Data from DHBs where selection criteria were not met

d Total number and rate calculations include only cases and population for DHBs meeting the selection criteria

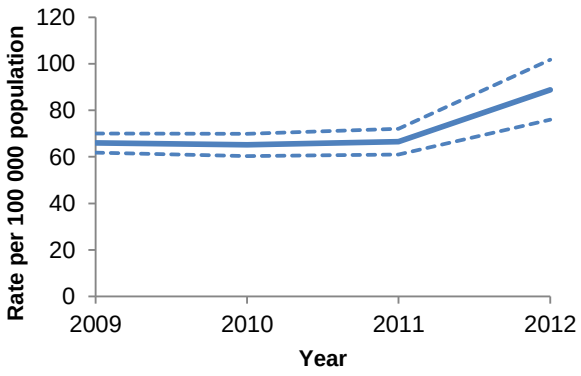
e Rates have not been calculated where there were fewer than five cases in any category

Trends in laboratory diagnoses

1. National rate trend analysis

Seventeen DHBs met the selection criteria for the national estimated rate trend analysis for gonorrhoea (Appendix B). Between 2011 and 2012, the estimated national gonorrhoea rate increased (from 67 to 89 per 100 000 population) while from 2009 to 2012, the estimated national gonorrhoea rate increased by 34.7% (from 66 to 89 per 100 000 population). The recent introduction of NAAT testing for gonorrhoea in some DHBs explains this observed increase. Prior to 2012, the estimate of the national gonorrhoea rate was stable. The estimated national gonorrhoea rates from 2009 to 2012, with a 95% confidence interval indicated, are shown in Figure 19.

Figure 19: Estimated national gonorrhoea rate, 2009–2012



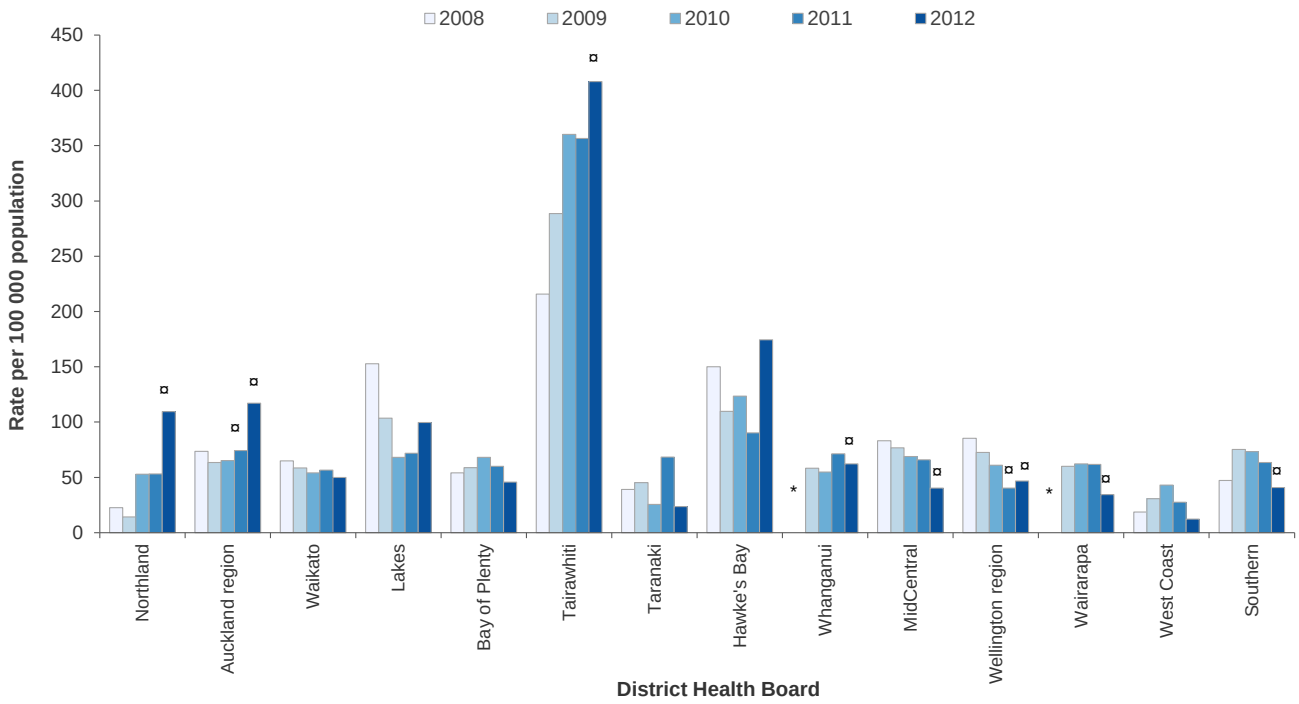
2. Individual DHB trend analysis

Seventeen DHBs met the selection criteria for the individual DHB trend analysis (Appendix B). From 2008 to 2012, the gonorrhoea rate varied among DHBs and across years (Figure 20). Introduction of NAAT testing for gonorrhoea in some DHBs will have contributed to increases observed in some DHBs (see Figure 20 footnotes). The most notable trend is the continued high gonorrhoea rate in Tairawhiti DHB. Other notable trends over this period are as follows.

i. Northland DHB, the Auckland region and Hawke's Bay DHB had increasing rates, associated with the introduction of NAAT testing in these DHBs/region.

ii. MidCentral DHB and the Wellington region DHBs had decreasing rates despite the introduction of NAAT testing.

Figure 20: Gonorrhoea rates by DHB, 2008 to 2012



* Data incomplete

Notes: Auckland region is comprised of Waitemata, Auckland and Counties Manukau DHBs. Wellington region is comprised of Hutt Valley and Capital & Coast DHBs. DHB rates are not age-standardised.

¤ In these DHBs or regions the following notes are applicable:

In 2010, NAAT testing was introduced in the Wellington region (Hutt Hospital Laboratory).

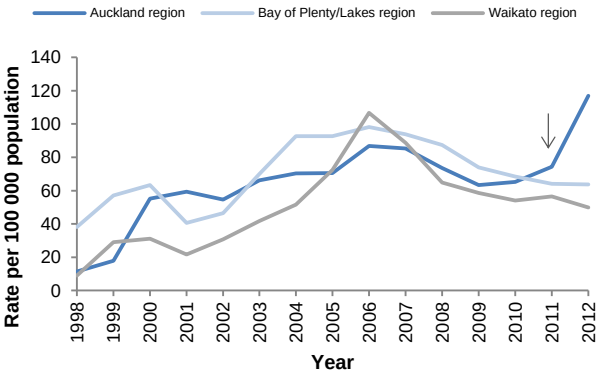
In 2011, NAAT testing was introduced in the Auckland region (Labplus) and Lakes (Taupo Southern Community Laboratory), Hawkes Bay (Hawke's Bay Southern Community Laboratory), and Southern DHBs

In 2012, NAAT testing was introduced in the Auckland (Labtests) and Wellington (Aotea Pathology) regions, and Northland (Northland Pathology), Tairawhiti, Whanganui, MidCentral, and Wairarapa DHBs

3. Three regions 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. While gonorrhoea rates continued to decline in 2012 for Waikato and Lakes/Bay of Plenty, there has been an increase (from 74 to 117 per 100 000, 57.4%) in the gonorrhoea rate in the Auckland region. It should be noted that the Auckland region is the only one of these three regions to have introduced routine NAAT testing to date. Figure 21 presents gonorrhoea rates in these three areas from 1998 to 2012.

Figure 21: Gonorrhoea rates in selected DHBs, 1998–2012



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

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

Age and sex distribution of test-positive cases

2012 analysis

Age and sex information was recorded for 99.4% (3296/3317) and 99.4% (3298/3317) of the test-positive gonorrhoea cases respectively. The national rate for males (90 per 100 000 population, 1657 cases) was higher than the national rate for females (86 per 100 000 population, 1641 cases) (Table 12). The highest rate of gonorrhoea in females was reported for Tairawhiti DHB (362 per 100 000, 87 cases), followed by Hawke's Bay (206 per 100 000, 164 cases) and Northland (133 per 100 000, 107 cases) DHBs. The highest rate of gonorrhoea in males was also reported for Tairawhiti DHB (457 per 100 000, 104 cases), followed by Hawke's Bay (141 per 100 000, 106 cases) and Lakes (125 per 100 000, 64 cases) DHBs.

The mean age of test-positive gonorrhoea cases was 23.5 years (median age 21 years, range 0–71 years). Sixty-seven percent (2199/3296) of positive cases were aged from 15 to 24 years. The highest national age-specific rate of test-positive gonorrhoea occurred in the 15–19 years age group for females (533 per 100 000 population, 687 cases), almost six times the national rate. For males, the highest age-specific rate of test-positive gonorrhoea cases occurred in the 20–24 years age group (395 per 100 000 population, 571 cases), over four times the national rate. The highest DHB age-specific rate was in the 15–19 years age group from Tairawhiti DHB (2540 per 100 000 population, 88 cases). Table 13 presents the number of test-positive gonorrhoea cases and gonorrhoea rates by DHB and age group for 2012. Two cases of gonorrhoea were reported for the less than one year age group.

Table 12: Number of test-positive gonorrhoea cases and gonorrhoea rates by DHB and sex, 2012

District Health Board	Number of test-positive cases				Rate per 100 000 population[e]		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	65	107	1	173	84	133	109
Auckland region[a]	882	890	11	1783	12	115	117
Waikato	102	83	0	185	56	44	50
Lakes	64	40	0	104	125	75	101
Bay of Plenty	63	34	0	97	61	31	46
Tairawhiti	104	87	0	191	457	362	408
Taranaki	13	13	0	26	24	23	24
Hawke's Bay	106	164	0	270	141	206	174
Whanganui	29	9	0	38	97	29	61
MidCentral	41	27	0	68	50	31	40
Wellington region[b]	115	90	1	206	53	40	47
Wairarapa	6	8	0	14	30	39	34
West Coast	4	0	0	4	-	-	-
Southern	63	89	6	158	41	57	51
Other[c]	90	89	0	179	-	-	-
Total[d]	**1657**	**1641**	**19**	**3317**	**90**	**86**	**89**

a Comprised of Waitemata, Auckland and Counties Manukau DHBs
b Comprised of Hutt Valley and Capital & Coast DHBs
c Data from DHBs where selection criteria were not met
d Total number and rate calculations include only cases and population for DHBs meeting the selection criteria
e Rates have not been calculated where there were fewer than five cases in any category

Table 13: Number of test-positive gonorrhoea cases and gonorrhoea rates by DHB and age group, 2012

District Health Board	Age Group (years)[e]																			
	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	2	-	0	-	6	52	79	749	48	545	21	285	7	100	6	71	3	-	1	–	173	109
Auckland region[a]	7	6	1	-	33	33	552	503	581	483	267	218	137	124	65	62	132	21	8	–	1783	117
Waikato	0	-	0	-	6	23	66	242	57	206	31	135	12	55	5	23	8	5	0	–	185	50
Lakes	0	-	0	-	3	-	39	529	37	544	13	217	6	102	3	-	3	-	0	–	104	101
Bay of Plenty	0	-	0	-	3	-	27	192	41	336	14	130	4	-	4	-	3	-	1	–	97	46
Tairawhiti	0	-	0	-	5	134	88	2540	55	1861	14	521	14	583	8	298	7	33	0	–	191	408
Taranaki	0	-	0	-	0	-	6	83	14	203	6	95	0	-	0	-	0	-	0	–	26	24
Hawke's Bay	3	-	0	-	16	142	111	1025	85	918	26	327	16	205	4	44	9	12	0	–	270	174
Whanganui	0	-	1	-	0	-	11	255	8	196	7	220	3	-	5	158	0	-	3	–	38	61
MidCentral	0	-	0	-	1	-	19	146	26	183	15	147	2	-	3	-	1	-	1	–	68	40
Wellington region[b]	0	-	0	-	4	-	60	201	66	181	26	76	14	44	18	58	18	9	0	–	206	47
Wairarapa	0	-	0	-	0	-	3	-	5	233	2	-	2	-	0	-	1	-	1	–	14	34
West Coast	0	-	0	-	0	-	1	-	2	-	0	-	1	-	0	-	0	-	0	–	4	12
Southern	0	-	0	-	0	-	49	217	63	234	16	80	5	27	6	33	13	9	6	–	158	51
Other[c]	0	–	0	–	5	–	109	–	121	–	45	–	37	–	22	–	41	–	5	–	385	–
Total[d]	**12**	**4**	**2**	**-**	**77**	**31**	**1111**	**420**	**1088**	**388**	**458**	**178**	**223**	**94**	**127**	**54**	**198**	**12**	**21**	**–**	**3317**	**89**

a Waitemata, Auckland and Counties Manukau DHBs

b Hutt Valley and Capital & Coast DHBs

c Data from DHBs where selection criteria were not met

d Total number and rate calculations include only cases and population for DHBs meeting the selection criteria

e 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 2012, the most striking change in the age distribution of test-positive cases of gonorrhoea has been a 71% increase in the gonorrhoea rate in females in the 15–19 years age group (from 312 to 533 cases per 100 000 population), solely driven by an increase since 2011. Smaller increases in gonorrhoea rates were experienced for many of the other age groups for both sexes over this time period (including the 15–19 years age group for males). Gonorrhoea rates per 100 000 population by age group and sex from 2009 to 2012 are presented in Figure 23.

Between 2009 and 2012 the female/male ratio of test-positive gonorrhoea cases increased from 0.77 to 0.99. During this period there was an increase in the number of test-positive gonorrhoea cases in both females and males (from 1036 to 1641 cases and from 1337 to 1657 cases respectively). The female/male ratio of test-positive cases and the total number of test-positive gonorrhoea cases from 2009 to 2012 are presented in Figure 22.

Figure 22: Female/male ratio of cases and total number of gonorrhoea cases, 2009–2012

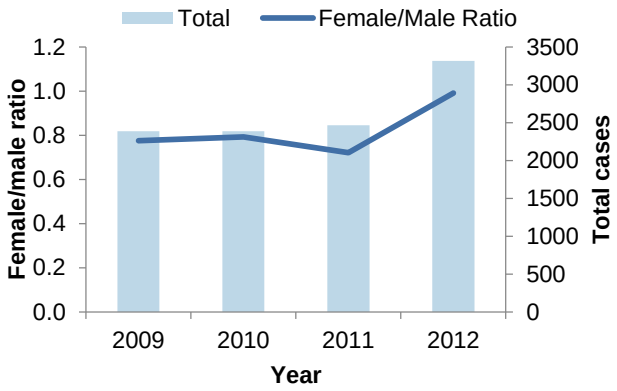
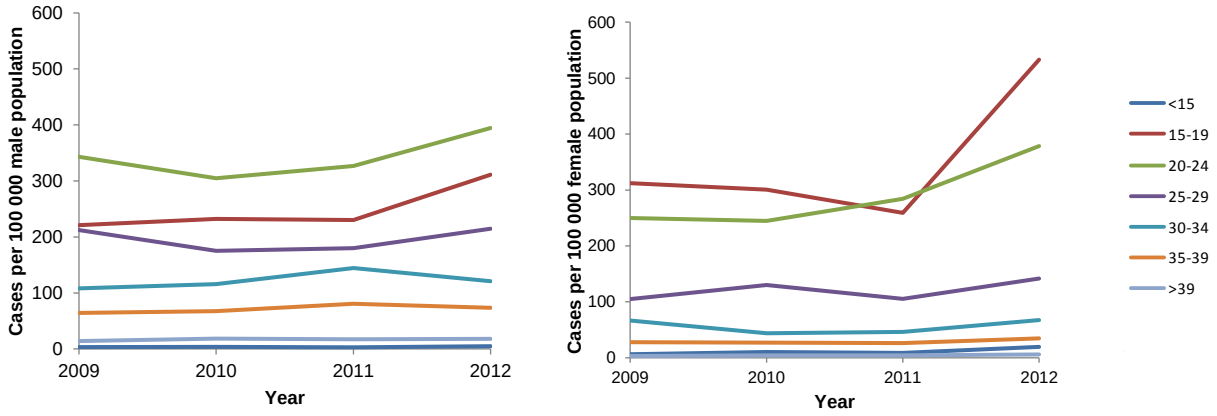


Figure 23: Gonorrhoea rates per 100 000 population by sex and age group, 2009–2012



Test positivity rates

2012 analysis

The 36 laboratories meeting the selection criteria (Appendix B) for gonorrhoea reporting tested 385 685 specimens for gonorrhoea, of which 1.0% (3827 specimens) tested positive from 3317 patients. The national gonorrhoea rate, based on 17 DHBs, was 89 per 100 000 population (3317 cases).

Table 14 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 confrmed cases, by DHB for 2012.

The highest number of tests relative to population size was reported from the Auckland region (137 per 1000 population), followed by Northland (119 per 1000 population) and Taranaki DHBs (101 per 1000 population). Of the specimens tested, Tairawhiti DHB had the highest percentage of positive specimens (4.6%), followed by Hawke's Bay DHB (2.3%). Variations between the DHBs may be explained in part by the testing methods used and by differences in how the total number of specmens are determined.

Trends in teset positivity

Seventeen DHBs met the criteria (Appendix B) for trend analysis of test positivity rates (Figure 24). Between 2009 and 2012, the percentage of positive results recorded for all specimens tested gonorrhoea, increased slightly from 0.9% to 1.0%. During this period, there was also a small increase in the number of specimens tested for gonorrhoea each year, from 365 188 specimens in 2009 to 385 685 specimens in 2012 (6% increase). It is not possible to determine how many of the tests were cultures and how many were NAATs from the current surveillance data.

Figure 24: Percentage of positive specimens tested and total specimens tested for gonorrhoea, 2009–2012

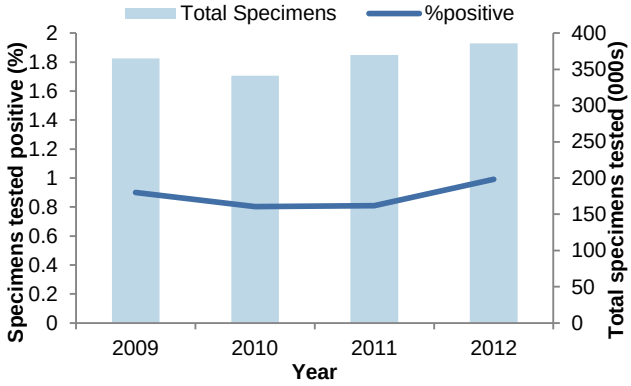


Table 14: Number of specimens tested for gonorrhoea, number of tests per 1000 population, percentage of specimens tested that were positive and number of laboratory-confirmed cases, by DHB, 2012

District Health Board	Total specimens	Tests per 1000 population	Specimens tested positive (%)	Number of laboratory-confirmed cases
Northland	18870	119	1.0	173
Auckland region[a]	208647	137	1.1	1783
Waikato	27576	74	0.7	185
Lakes	8872	86	1.2	104
Bay of Plenty	12927	61	0.8	97
Tairawhiti	4490	96	4.6	191
Taranaki	11090	101	0.3	26
Hawke's Bay	11889	77	2.3	270
Whanganui	2745	44	1.4	38
MidCentral	9737	58	0.7	68
Wellington region[b]	36767	83	0.6	206
Wairarapa	1660	41	0.8	14
West Coast	2502	76	0.2	4
Southern	27913	91	0.6	158
Other[c]	35562	-	0.6	179
Total[d]	**385685**	**103**	1.0	3317

a Waitemata, Auckland and Counties Manukau DHBs

b Hutt Valley and Capital & Coast DHBs

c Data from DHBs where selection criteria were not met

d Total includes only cases and populations for DHBs meeting the selection criteria

Specimen site

2012 analysis

The site from which the specimen was taken was recorded for 98.2% (2594/2642) of positive specimens, based on gonorrhoea data from 26 laboratories (Appendix B). In females, the most common specimen site was the cervix (46.7%, 637/1365 positive specimens). In males, the most common specimen site was the urethra (53.1%, 653/1229 positive specimens). In both males and females, the proportion of positive sites that were not urogenital was comparatively low (116/1229, 9.4% for males, and 252/1365, 18.5% for females).

Table 15: Count of positive gonorrhoea tests by specimen site and sex, 2012

Specimen site	Sex	
	Male	Female
Urethral	653	29
Vaginal	-	296
Cervix	-	637
Penile	96	-
Anorectal	19	11
Eye	1	3
Urine	364	151
Throat	17	0
Other	79	238
Unknown	25	23

Trends in site of infection

Figure 25 and Figure 26 present the specimen site of positive gonorrhoea tests, reported by 26 laboratories between 2009 and 2012 for females and males. Of note, there has been a decrease in the number of positive tests from urethral specimens in males (826 to 653 specimens). There has also been a large increase in the number of positive specimens from urinary specimens in both females and males (1 to 151 and 19 to 364 specimens, respectively), and cervical specimens in females (447 to 637 specimens).

Figure 25: Specimen site, all positive gonorrhoea tests in males, 2009-2012

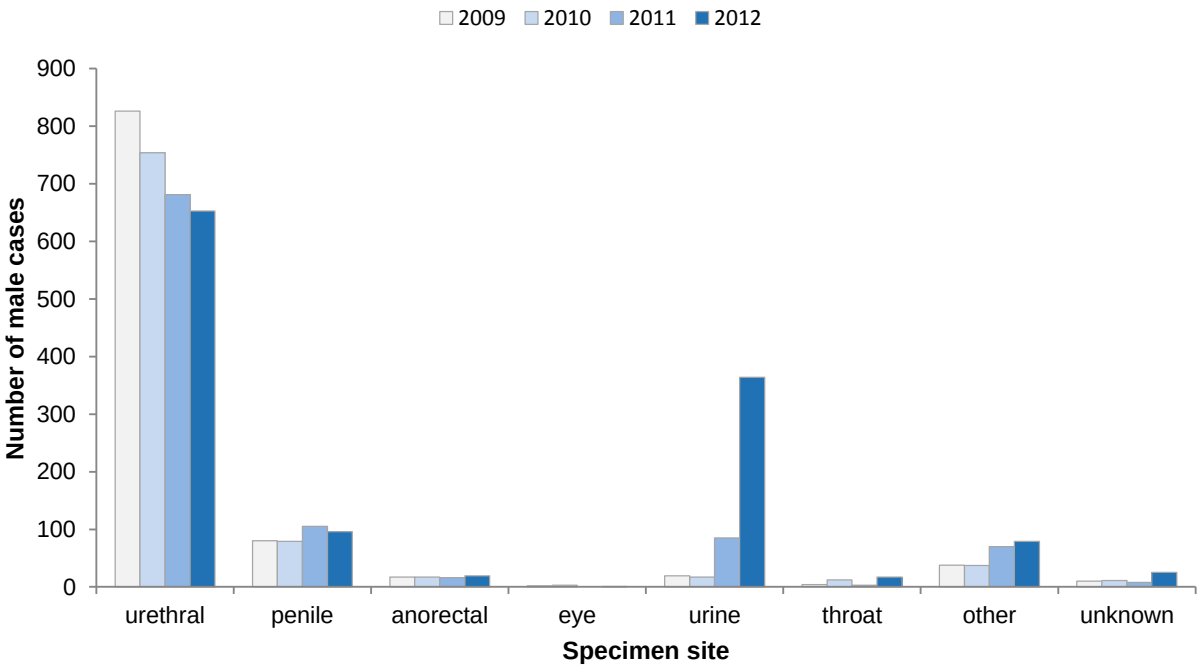
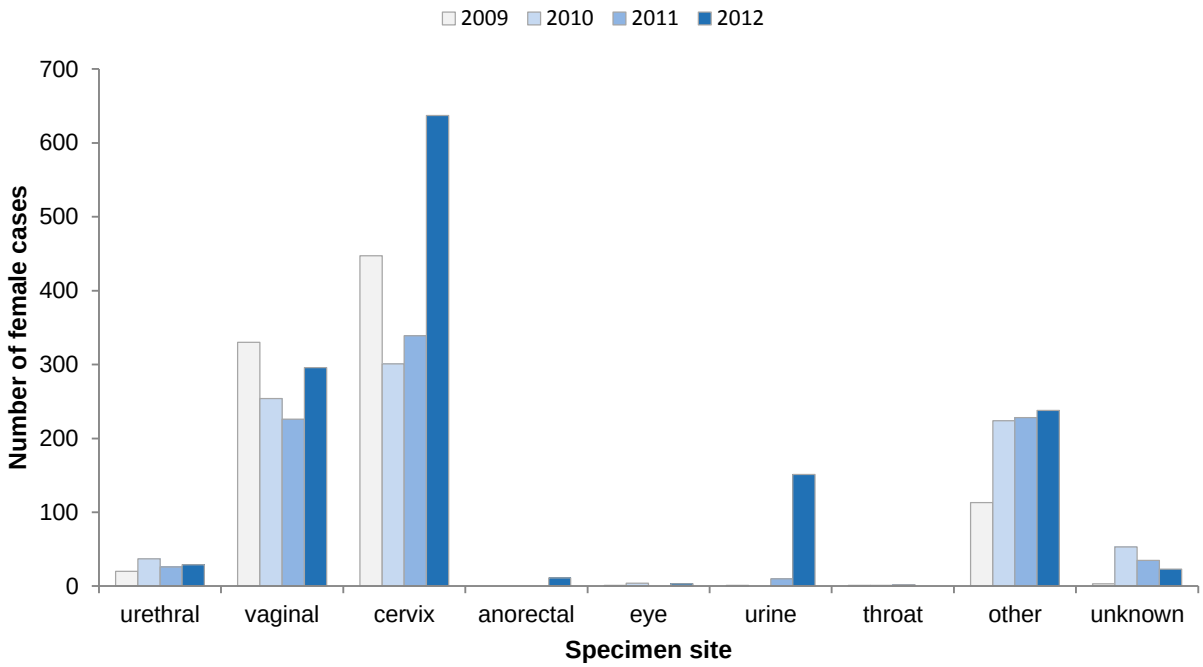


Figure 26: Specimen site, all positive gonorrhoea tests in females, 2009-2012



Antibiotic resistance surveillance

The latest antibiotic resistance surveillance data available from diagnostic laboratories is from 2011. In that year, the prevalence of resistance to penicillin and ciprofloxacin among *N. gonorrhoeae* isolates was 11.6% and 40.8% respectively. This rate of penicillin resistance is similar to the 2010 rate of 12.4%, while ciprofloxacin resistance increased by about 5 percentage points from the 2010 rate of 35.4%. In 2011, penicillin resistance ranged from 28.7% in the Auckland region to 3.5% in Bay of Plenty DHB. Ciprofloxacin resistance ranged from 53.5% in MidCentral/Whanganui DHBs to 7.3% in Southern DHB. Data were not available for the West Coast DHB (Table 16). The prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates from 2000 to 2011 is illustrated in Figure 27.

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 reduced susceptibility to ceftriaxone (MICs typically 0.06 mg/L) have been identified in the Auckland region.

Figure 27: Prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates, 2000–2011

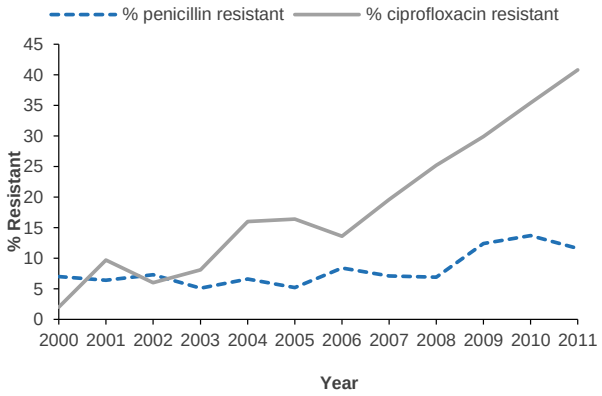


Table 16: Penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates by DHB, 2011

District Health Board[1]	Penicillin		Ciprofloxacin	
	Number tested	% resistant	Number tested	% resistant
Northland	38	7.9	71	49.3
Auckland region[2]	317	28.7	1081	43.5
Waikato	187	9.6	193	44.0
Lakes	44	9.1	55	21.8
Bay of Plenty	258	3.5	312	27.6
Tairawhiti	-	-	168	35.7
Taranaki	-	-	36	47.2
Hawke's Bay	137	6.6	119	46.2
MidCentral/Whanganui	116	4.3	116	53.5
Wairarapa	27	7.4	27	37.0
Wellington region[3]	165	8.5	173	50.9
Nelson Marlborough	-	-	25	32.0
Canterbury region[4]	64	7.8	65	46.2
Southern	41	4.9	68	7.3
Total[1]	**1394**	**11.6**	**2509**	**40.8**

[1] No data available for West Coast DHB
[2] Waitemata, Auckland and Counties Manukau DHBs
[3] Hutt Valley and Capital & Coast DHBs
[4] Canterbury and South Canterbury DHBs

Clinic surveillance of gonorrhoea

National analysis

2012 analysis

In 2012, the gonorrhoea case numbers reported by SHCs and FPCs were 768 and 203 cases respectively (Table 17).

Table 17: Gonorrhoea case numbers by clinic type, 2012

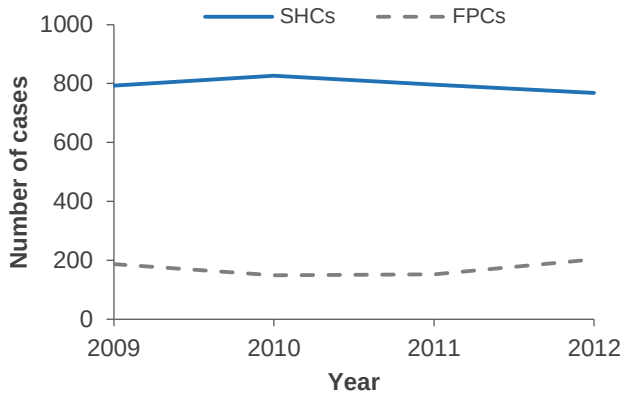
Clinic type	Total Number of cases
SHC	768
FPC	203
Total	**971**

Trends in national totals

Between 2011 and 2012, gonorrhoea case numbers reported by SHCs decreased by 3.5% (from 796 to 768). In contrast, case numbers reported by FPCs increased by 33.6% (from 152 to 203 cases).

From 2009 to 2012, gonorrhoea case numbers reported by SHCs decreased by 3.2% (from 793 to 768). In contrast, the number of gonorrhoea cases reported by FPCs increased by 8.6% (from 187 to 203) from 2009 to 2012.

Figure 28: Gonorrhoea case numbers by clinic type, 2009 to 2012



DHB counts

2012 analysis

Clinics in 19 DHBs contributed to gonorrhoea surveillance in 2012. Gonorrhoea case numbers in each DHB by clinic type are presented in Table 18. The highest case numbers of gonorrhoea in SHCs were seen in the Auckland region (313 cases) and Waikato DHB (75 cases). In DHBs with both SHCs and FPCs, higher case counts were seen in SHCs, except in Tairawhiti and Nelson Marlborough DHBs.

Table 18: Gonorrhoea case numbers by clinic type and DHB, 2012

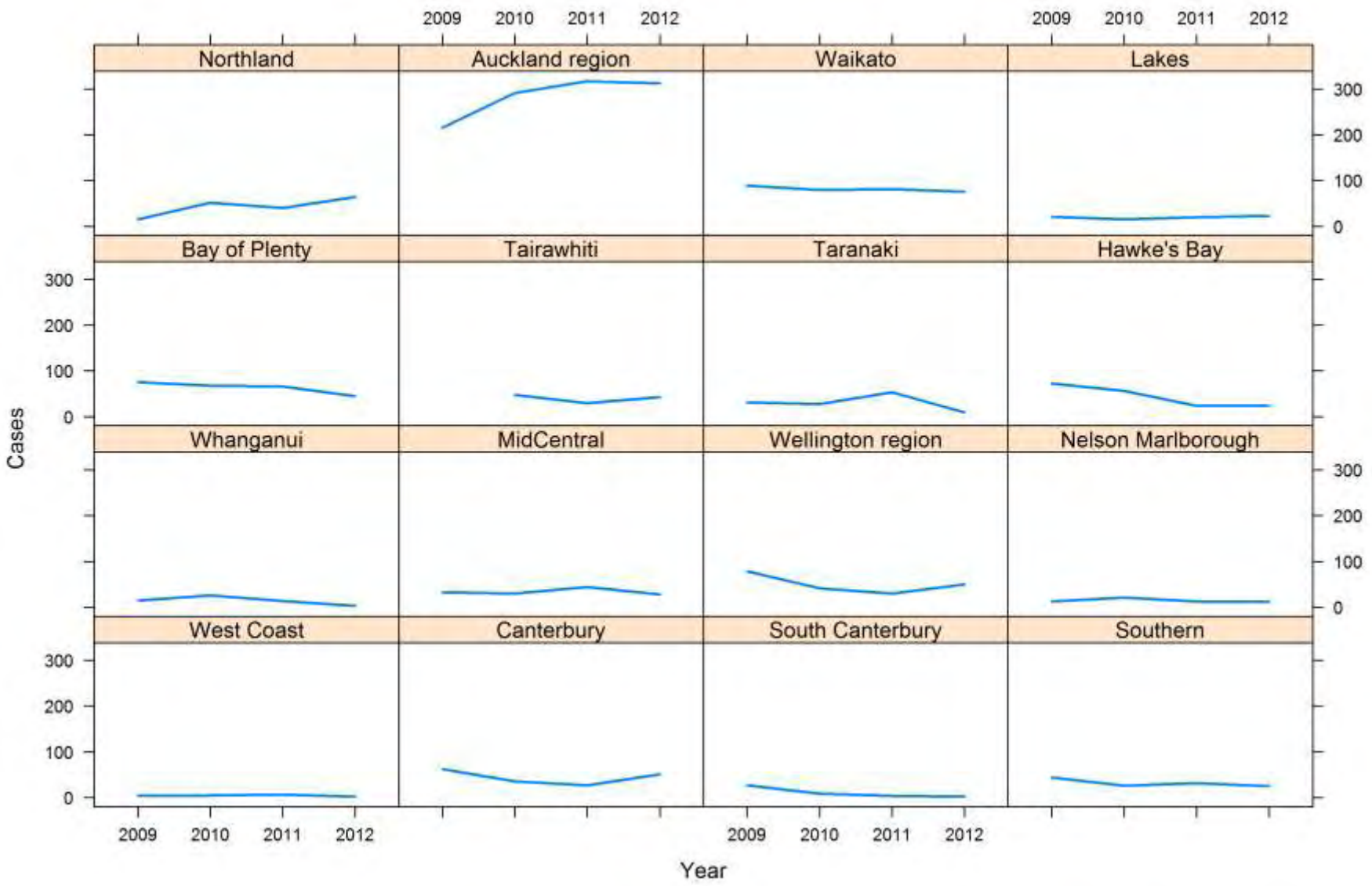
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	64	6	70
Auckland region[a]	313	58	371
Waikato	75	33	108
Lakes	23	-	23
Bay of Plenty	45	1	46
Tairawhiti	43	47	90
Taranaki	9	1	10
Hawke's Bay	24	-	24
Whanganui	3	1	4
MidCentral	28	-	28
Wellington region[b]	50	23	73
Nelson Marlborough	11	15	26
West Coast	2	-	2
Canterbury	51	10	61
South Canterbury	2	-	2
Southern	25	8	33

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 2012 are presented by DHB in Figure 29. There is variation in the trends seen among DHBs. For example, case numbers increased over the four year period in Northland DHB, and increased then stabilised in the Auckland region, while a decreasing number of cases was seen in Bay of Plenty and Hawke's Bay DHBs.

Figure 29: Gonorrhoea case numbers in SHCs by DHB, 2009–2012



* data was not available for Tairawhiti DHB for 2009

Sex, age and ethnicity distribution of gonorrhoea cases

2012 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 2012, the male to female ratio of attendees at FPCs was 1:25). Table 19 presents the number of cases of gonorrhoea by sex and clinic type for 2012.

Table 19: Gonorrhoea case by sex and clinic type, 2012

Sex	Clinic type	
	SHC	FPC
Male	489	37
Female	279	166
Total	**768**	**203**

Age was recorded for all gonorrhoea cases in 2012. A large proportion of the reported cases of gonorrhoea were aged less than 25 years – 58.5% (449/768) in SHCs and 89.7% (182/203) in FPCs. The mean age of gonorrhoea cases was 25.8 years in SHCs and 19.6 years in FPCs.

The number of males with gonorrhoea was highest in the 20–24 years age group in SHCs (156 cases), while in FPCs, the highest number of males with gonorrhoea was in the 15–19 years age group (19 cases). The number of females with gonorrhoea was highest in the 15–19 years age group across both clinic types – 120 cases (43.0%) in SHCs and 99 cases in FPCs (59.6%).

Figure 30 and Figure 31 present the number of confirmed cases of gonorrhoea by age group and sex for 2012 in SHCs and FPCs.

Figure 30: Gonorrhoea case numbers reported by SHCs by age group and sex, 2012

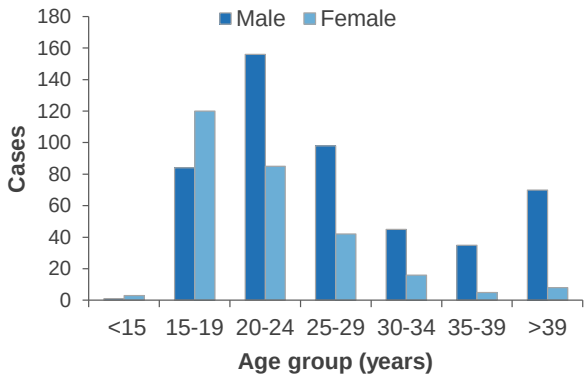
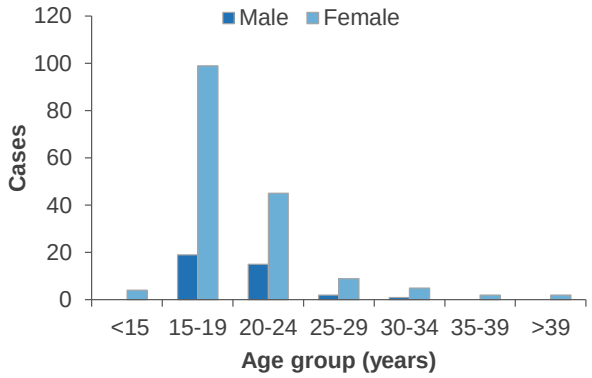


Figure 31: Gonorrhoea case numbers reported by FPCs by age group and sex, 2012



Ethnicity was recorded by SHCs for 98.3% (755/768) of the reported cases of gonorrhoea. The highest percentage of gonorrhoea cases reported by SHCs were of Māori ethnicity (46.0%, 347 cases), followed by European (34.4%, 260 cases), Pacific Peoples (12.8%, 97 cases) and Other (6.8%, 51 cases) ethnicity (Table 20). Ethnicity was recorded by FPCs for 95.1% (193/203) of the reported cases. The highest percentage of gonorrhoea cases reported by FPCs were of Māori ethnicity (62.7%, 121 cases), followed by European (22.3%, 43 cases), Pacific Peoples (13.5%, 26 cases) and Other (1.6%, 3 cases) ethnicity.

Table 20: Gonorrhoea cases by ethnicity and clinic setting, 2012

Ethnicity	Clinic type	
	SHC	FPC
European	260	43
Māori	347	121
Pacific Peoples	97	26
Other	51	3
Unknown	13	10
Total	**768**	**203**

Trends in sex, age and ethnicity

Between 2009 and 2012, 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 32).

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 99 cases and from 34 to 45 cases respectively). Male case numbers were consistently low across all age group in FPCs between 2009 and 2012 (Figure 33).

Figure 32: Gonorrhoea cases in SHCs by sex and age group, 2009–2012

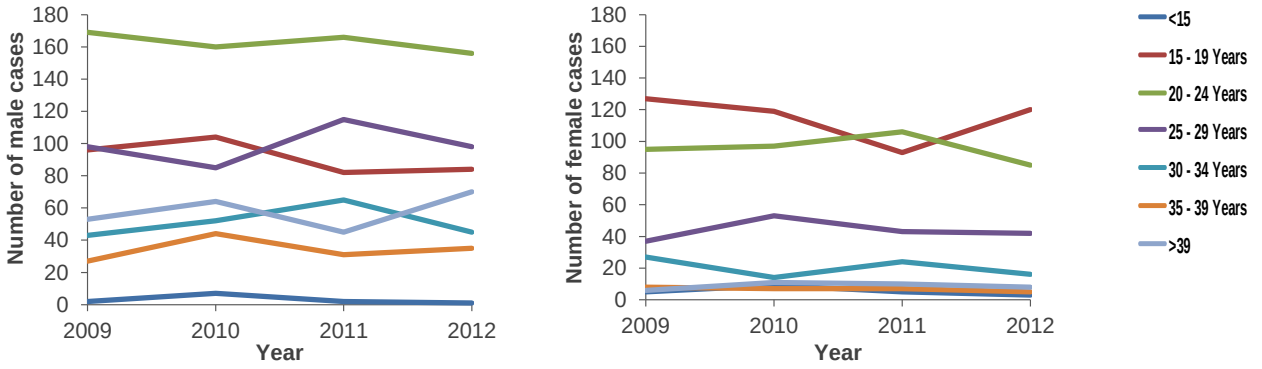


Figure 33: Gonorrhoea cases in FPCs by sex and age group, 2009–2012

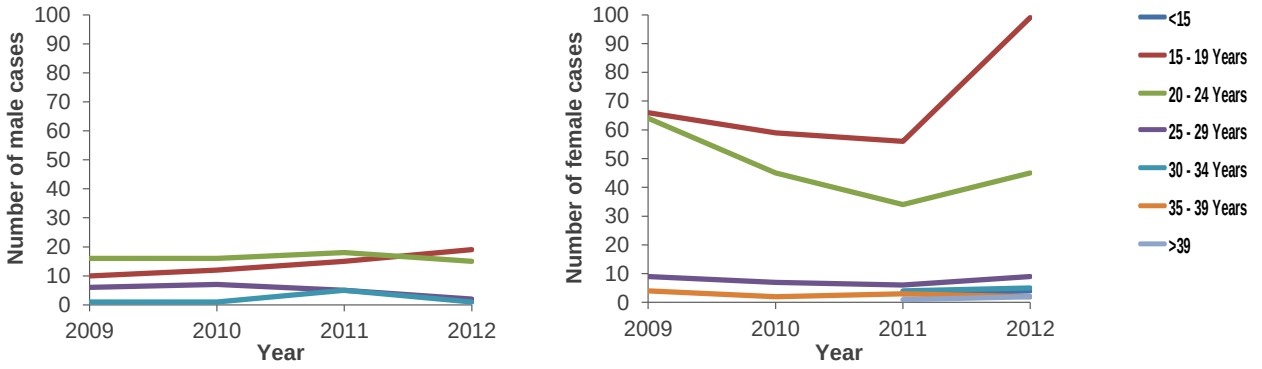


Figure 34 and Figure 35 present the number of cases of gonorrhoea reported from SHCs and FPCs by ethnicity between 2009 and 2012. Of note, there was an increase in the number of cases seen in Māori (84 to 121 cases) in FPCs. Of the 121 cases of gonorrhoea in Māori reported by FPCs in 2012, a third (42 cases) were reported in Tairawhiti DHB. There was a decrease in the number of gonorrhoea cases in both SHCs and FPCs in the European ethnic group (305 to 260 cases and from 63 to 43 cases respectively) between 2009 and 2012.

Figure 34: Gonorrhoea cases reported from SHCs by ethnicity, 2009–2012

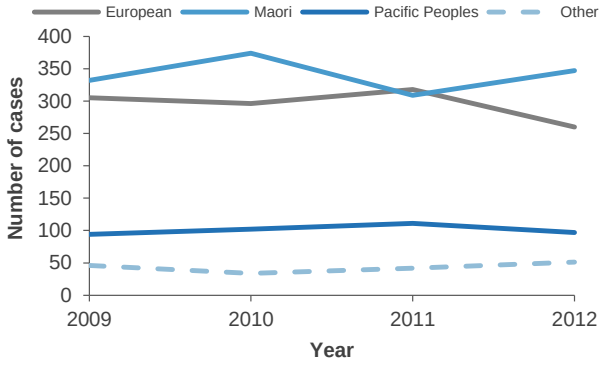
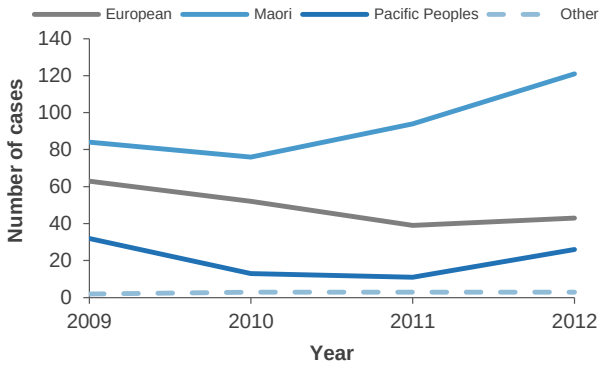


Figure 35: Gonorrhoea cases reported from FPCs by ethnicity, 2009–2012



Site of infection

2012 analysis

In 2012, gonorrhoea cases were most commonly confirmed from a urogenital site in both types of clinic as follows: 85.3% of SHC cases (655 cases) and 95.1% of FPC cases (193 cases) (Table 21).

In SHCs, the next most common site was anorectal at 8.9% (68 cases), followed by the pharynx at 7.9% (61 cases).

Table 21: Gonorrhoea cases by site of infection and clinic setting, 2012

Site	Clinic type	
	SHC	FPC
Urogenital	655	193
Anorectal	68	0
PID/epididymitis	6	10
Pharynx	61	1
Other site	4	0
Total[a]	**768**	**203**

a Cases with the infection 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 36 and Figure 37 present the trends in non-complicated non-urogenital gonorrhoea sites reported by SHCs between 2009 and 2012 for males and females. In males, there was an increase in anorectal and pharyngeal gonorrhoea infections reported by SHCs (from 28 to 60 cases and from 18 to 61 cases respectively), between 2009 and 2012. In females, the number of anorectal gonorrhoea infections fluctuated between five and eight cases, whereas pharyngeal infections dropped from six cases in both 2010 and 2011 to none in 2012. Gonorrhoea infections at other sites have remained low for both sexes.

Figure 36: Site of infection, non-complicated non-urogenital gonorrhoea cases in males in SHCs, 2009–2012

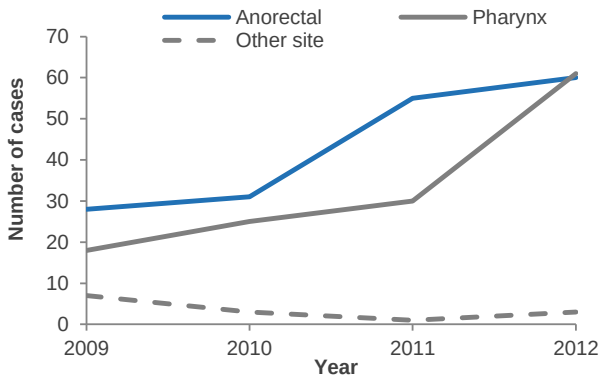
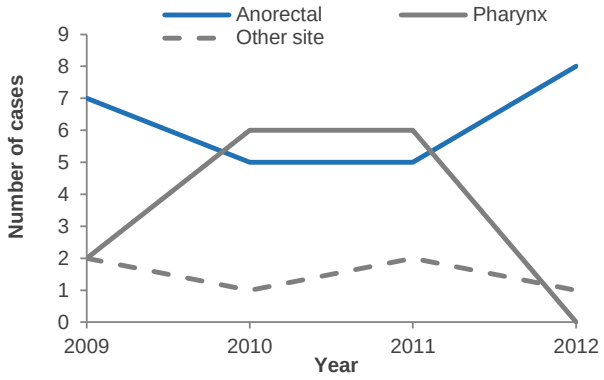


Figure 37: Site of infection, non-complicated non-urogenital gonorrhoea cases in females in SHCs, 2009–2012



Complicated infections

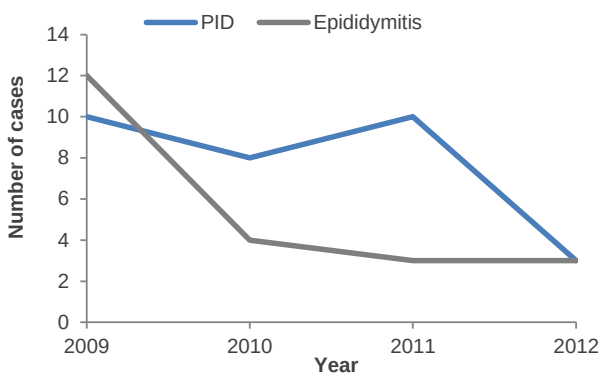
2012 analysis

Complicated infections (epididymitis in males and PID in females) were reported for 0.8% (6/768) of gonorrhoea cases in SHCs and 4.9% (10/203) in FPCs. A total of three males, all from SHCs, were reported with epididymitis. Two of the three cases were aged less than 25 years. Two of the epididymitis cases were of Māori ethnicity and the remaining case was of European ethnicity. A total of 13 females (3 in SHCs and 10 in FPCs) were reported with PID, 84.6% (11 cases) of whom were aged less than 25 years. Ethnicity was recorded for all female PID cases, seven cases (53.8%) were of Māori ethnicity, five cases (38.5%) were of European ethnicity and one case (7.7%) was of Pacific Peoples ethnicity.

Trends in complicated infections

Figure 38 presents the trends in cases of complicated gonorrhoea infections reported by SHCs between 2009 and 2012. There was a 70% decrease in the number of PID cases caused by gonorrhoea (from 10 to 3 cases) from 2009 to 2012. The number of epididymitis infections dropped from 12 to four between 2009 and 2010 and have since remained low.

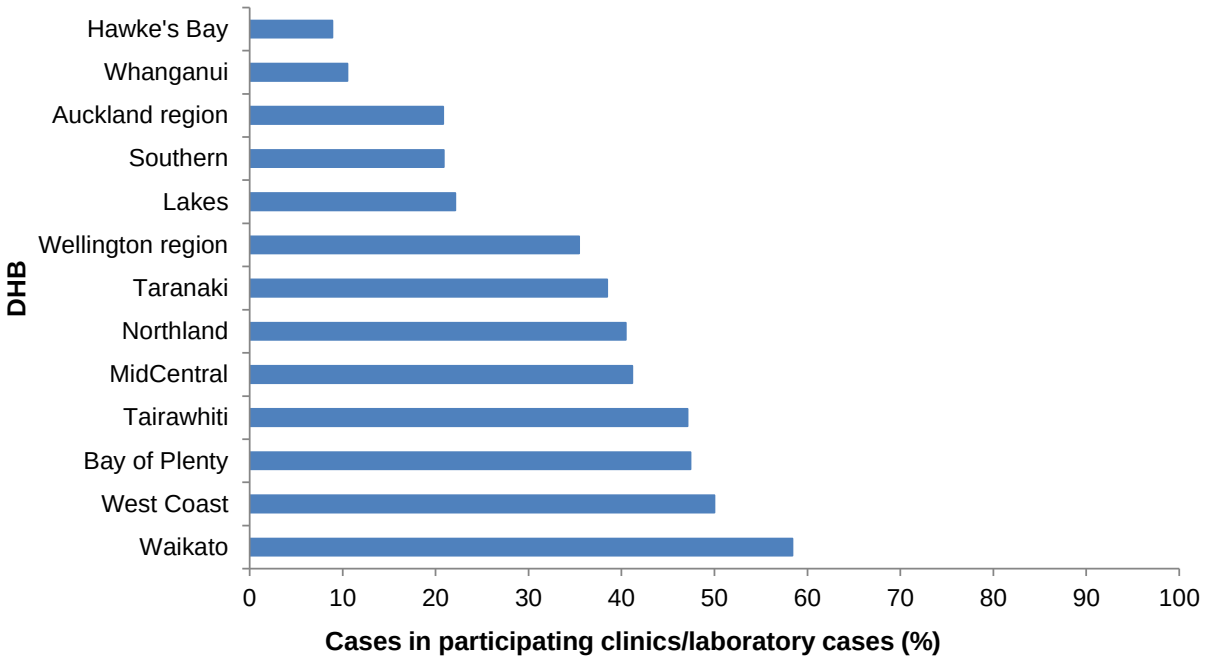
Figure 38: Complicated infections, gonorrhoea cases in SHCs, 2009 -2012



Comparison of laboratory and clinic surveillance

For DHBs that met the selection criteria (Appendix B) for gonorrhoea laboratory reporting and have clinics that participate in the STI surveillance programme, clinic cases as a proportion of laboratory cases are presented in Figure 39. Gonorrhoea cases not seen in the participating clinics are likely to be diagnosed predominantly in primary care. The highest proportion of gonorrhoea cases seen in a participating clinic was in Waikato DHB (58.4%), followed by West Coast (50.0%) and Bay of Plenty (47.4%) DHBs. The lowest proportions of gonorrhoea cases seen in a participating clinic were in Hawke's Bay (8.9%) and Whanganui (10.5%) DHBs.

Figure 39: Cases of gonorrhoea seen in participating clinics as a proportion (%) of all positive laboratory tests, by DHB, 2012



GENITAL HERPES

GENITAL HERPES (FIRST PRESENTATION)

Key findings

- In 2012, 1082 first presentations of genital herpes were reported. 830 cases were seen in SHCs and 252 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 [4]. The prevalence of HSV-2 antibodies in the Dunedin birth cohort was 3.4% at 21 years, 11% at 26 years and 18.4% at 32 years of age [5].

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

Clinic surveillance of genital herpes (first presentation)

National analysis

2012 analysis

In 2012, the clinic counts of genital herpes (first presentation) reported by SHCs and FPCs were 830 cases and 252 cases respectively (Table 22).

Table 22: Genital herpes (first presentation) case numbers by clinic type, 2012

Clinic type	Total number of cases
SHC	830
FPC	252
Total	**1082**

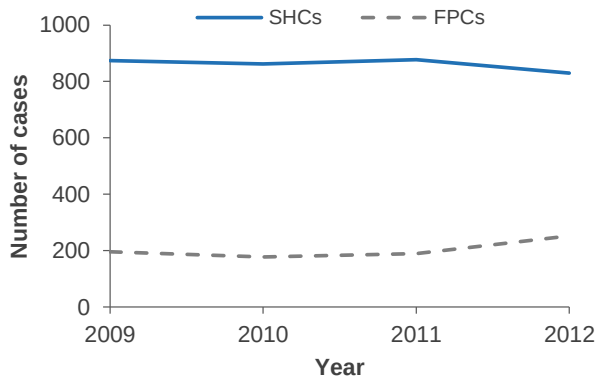
Trends in national totals

Between 2011 and 2012, genital herpes clinic case counts reported by SHCs decreased by 5.4% (from 877 to 830 cases). By contrast, genital herpes clinic case counts reported by FPCs increased by 33.3% (from 189 to 252 cases).

From 2009 to 2012, genital herpes clinic case counts reported by SHCs decreased by 5.0% (from 874 to 830 cases). By contrast, gential herpes clinic case counts increased by 28.6% in FPCs (from 196 to 252 cases) (Figure 40).

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 40: Genital herpes (first presentation) cases by clinic type, 2009–2012



DHB counts

2012 analysis

Clinics in 19 DHBs contributed to genital herpes surveillance in 2012. The numbers of genital herpes cases in each clinic type by DHB are presented in Table 23. The highest case numbers of genital herpes in SHCs were seen in the Auckland region (207 cases) and in Canterbury (97 cases) DHB. In DHBs with both SHCs and FPCs, higher genital herpes case counts were seen in SHCs, with the exception of Nelson Marlborough.

Table 23: Genital herpes (first presentation) case numbers by clinic type and DHB, 2012

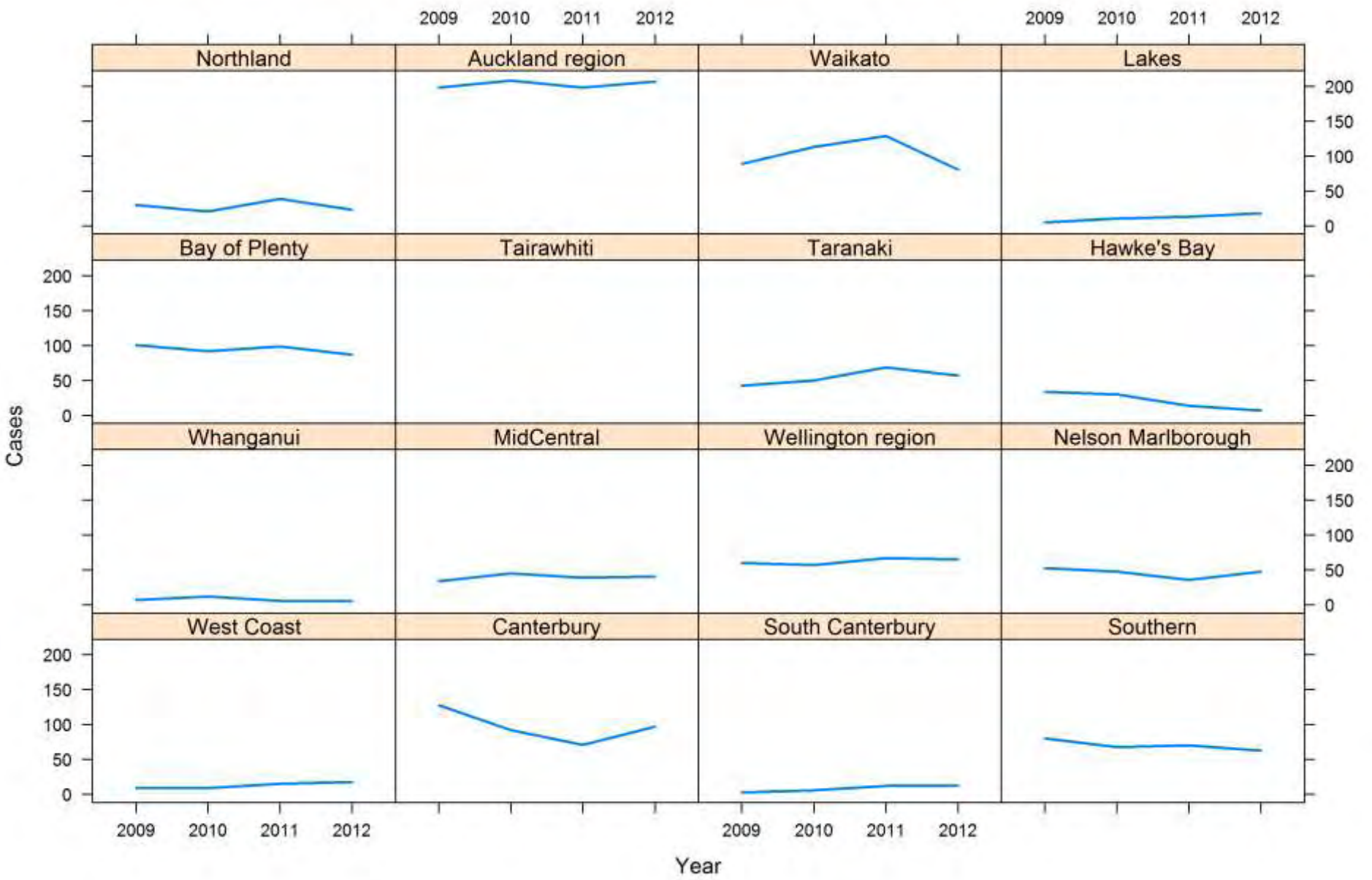
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	23	1	24
Auckland region[a]	207	37	244
Waikato	81	18	99
Lakes	18	-	18
Bay of Plenty	87	8	95
Tairawhiti	-	12	12
Taranaki	57	1	58
Hawke's Bay	7	-	7
Whanganui	5	11	16
MidCentral	41	-	41
Wellington region[b]	65	45	110
Nelson Marlborough	48	55	103
West Coast	18	-	18
Canterbury	97	40	137
South Canterbury	13	8	21
Southern	63	16	79

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

Trends in DHB counts

The number of genital herpes cases in SHCs from 2009 to 2012 are presented by DHB in Figure 41. There is variation in the trends seen among DHBs. For example, there are increasing case numbers over the four-year period in the Auckland region and in Lakes DHB, while decreasing case numbers were seen in Hawke's Bay, Canterbury and Southern DHBs.

Figure 41: Genital herpes case numbers in SHCs by DHB, 2009–2012



* Data was not available for Tairawhiti DHB for 2009–2012

Sex, age and ethnicity distribution of genital herpes

2012 analysis

Sex was recorded for all cases of genital herpes. More cases of genital herpes were seen in males than females at SHCs (55.0%, 432/830 cases). By contrast, more cases of genital herpes were seen in females than males at FPCs (80.2%, 202/252 cases) (Table 24). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2012, the male to female ratio of attendees at FPCs was 1:25).

Table 24: Genital herpes (first presentation) cases by sex and clinic type, 2012

Sex	Clinic type	
	SHC	FPC
Male	432	50
Female	398	202
Total	**830**	**252**

Age was recorded for all cases of genital herpes. In SHCs, 41.0% (340/830) of the reported cases of genital herpes were aged less than 25 years. This proportion was larger in FPCs (63.5%, 160/252). The mean age of genital herpes cases was 29.5 years in SHCs and 25.3 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 (129 cases in SHCs and 65 cases in FPCs, 106 cases in SHCs and 25 cases in FPCs, respectively). Figure 42 and Figure 43 present the number of genital herpes cases reported by age group and sex for SHCs and FPCs in 2012.

Figure 42: Number of cases of genital herpes reported by SHCs by age group and sex, 2012

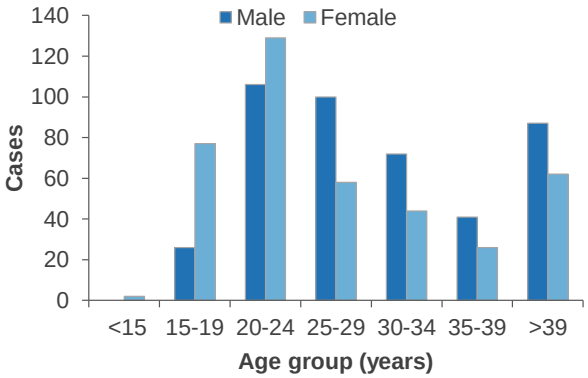


Figure 43: Number of cases of genital herpes reported by FPCs by age group and sex, 2012

Ethnicity was recorded by SHCs for 97.8% (812/830) of the reported cases of genital herpes (Table 25). The highest percentage of cases recorded by SHCs were of European ethnicity (74.5%, 605 cases), followed by Māori (15.5%, 126 cases), Other (7.6%, 62 cases) and Pacific Peoples (2.3%, 19 cases) ethnicity. Ethnicity was recorded by FPCs for 94.4% (238/252) of the reported cases of genital herpes. The highest percentage of cases recorded by FPCs were of European ethnicity (78.2%, 186 cases), followed by Māori (14.7%, 35 cases), Other (4.6%, 11 cases) and Pacific Peoples (2.5%, 6 cases) ethnicity.

Table 25: Genital herpes (first presentation) cases by ethnicity and clinic type, 2012

Ethnicity	Clinic type	
	SHC	FPC
European	605	186
Māori	126	35
Pacific Peoples	19	6
Other	62	11
Unknown	18	14
Total	**830**	**252**

Trends in sex, age and ethnicity

Between 2009 and 2012, the highest numbers of genital herpes cases in SHCs were in females in the 15–19 years and 20–24 years age groups (Figure 44). A large decrease in case numbers occurred in the female 15–19 years age group, while a slightly decreasing or stable trend in case numbers was observed in the other age groups among females. By contrast, a slightly increasing or stable trend in case numbers was observed in all age groups among males.

In FPCs, the highest numbers of genital herpes cases were in females in the 15–19 years and 20–24 years age groups (Figure 45). Case numbers remained stable over the four-year period for all age groups in males, except for a slightly increasing trend in the 20–24 years age group. For females, there were increases in most age groups.

Figure 44: Genital herpes (first presentation) cases in SHCs by sex and age group, 2009–2012

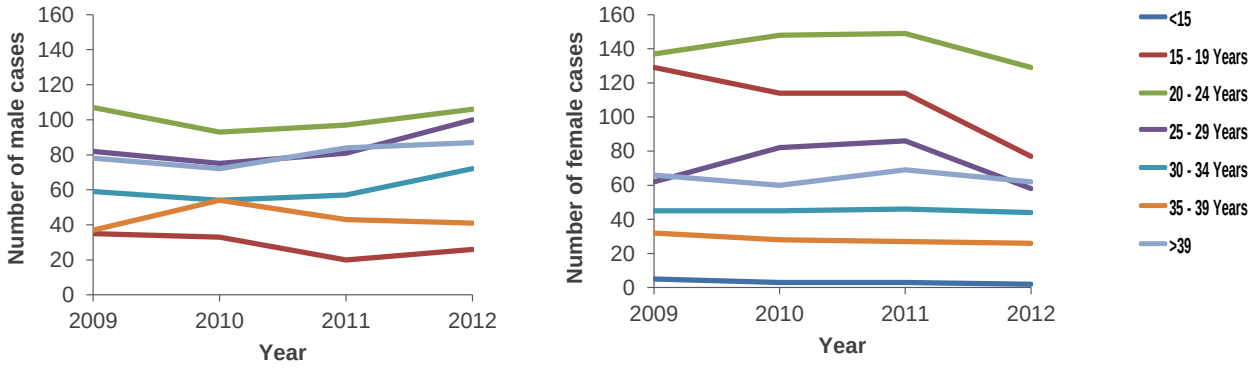


Figure 45: Genital herpes (first presentation) cases in FPCs by sex and age group, 2009–2012

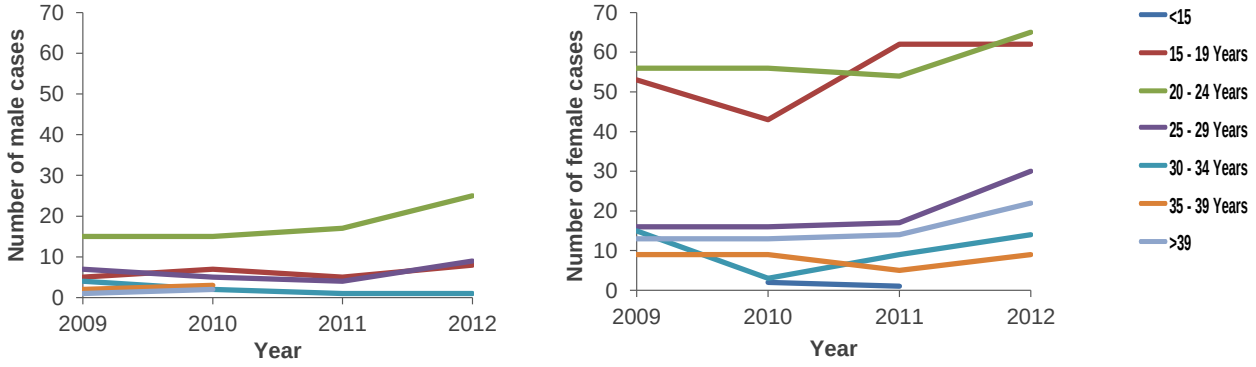


Figure 46 and Figure 47 present the number of first presentations of genital herpes reported from SHCs and FPCs by ethnicity between 2009 and 2012. Cases of genital herpes were substantially more common in those of European ethnicity in both clinic settings over the four-year period. In SHCs, case numbers 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 (38%, from 135 to 186 cases).

Figure 46: Number of genital herpes (first presentation) cases reported from SHCs, by ethnicity, 2009-2012

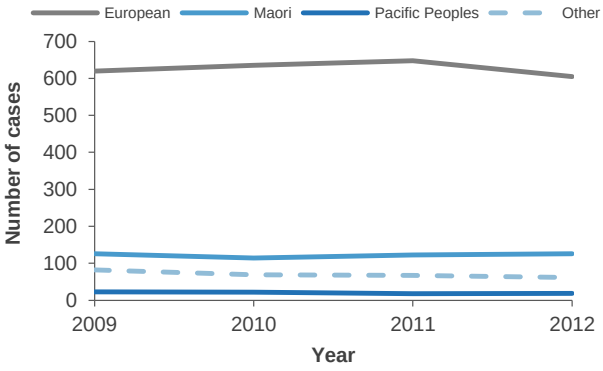
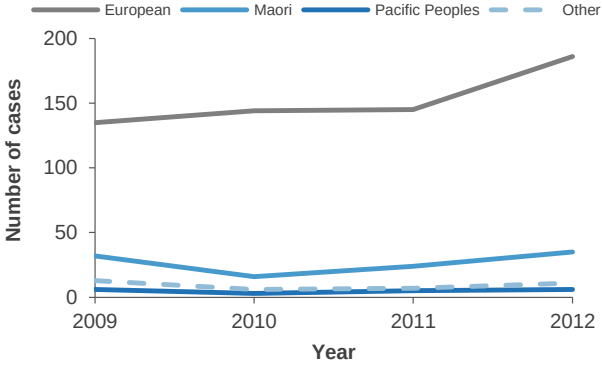


Figure 47: Number of genital herpes (first presentation) cases reported from FPCs, by ethnicity, 2009-2012



GENITAL WARTS

GENITAL WARTS (FIRST PRESENTATION)

Key findings

- In 2012, 2486 first presentations of genital warts were reported. Of these, 2231 were seen in SHCs.
- Case numbers decreased in all clinic settings between 2011 and 2012.
- 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 oropharangeal 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 [7]. 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 [8]. 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 up to the end of 2012 [9] .

Clinic surveillance of genital warts (first presentation)

National analysis

2012 analysis

In 2012, genital warts was the most commonly reported viral STI in New Zealand. Clinic counts of genital warts (first presentation) reported by SHCs and FPCs were 2231 cases and 255 cases respectively, in 2012 (Table 26).

Table 26: Genital warts (first presentation) case numbers by clinic type, 2012

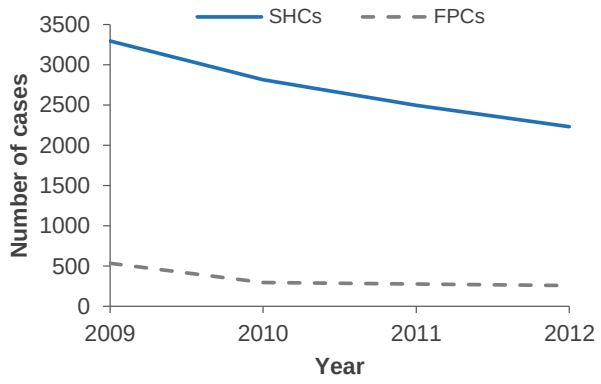
Clinic type	Total number of cases
SHC	2231
FPC	255
Total	**2486**

Trends in national totals

Between 2011 and 2012, genital warts clinic case counts reported by SHCs decreased by 10.5% (from 2493 to 2231 cases) and case counts reported by FPCs by 7.6% (from 276 to 255 cases).

From 2009 to 2012, genital warts clinic case counts reported by SHCs decreased by 32.3% (from 3294 to 2231 cases) and case counts reported by FPCs by 52.1% (from 532 to 255 cases) (Figure 48).

Figure 48: Genital warts (first presentation) cases by clinic type, 2009–2012



DHB counts

2012 analysis

Clinics in 19 DHBs contributed to genital warts surveillance in 2012. The numbers of genital warts cases in each clinic type by DHB are presented in Table 27. The highest case numbers of genital warts in SHCs were seen in the Auckland (807 cases) and Wellington (257 cases) regions. In DHBs with both SHCs and FPCs, higher genital warts case counts were seen in SHCs.

Table 27: Genital warts (first presentation) case numbers by clinic type and DHB, 2012

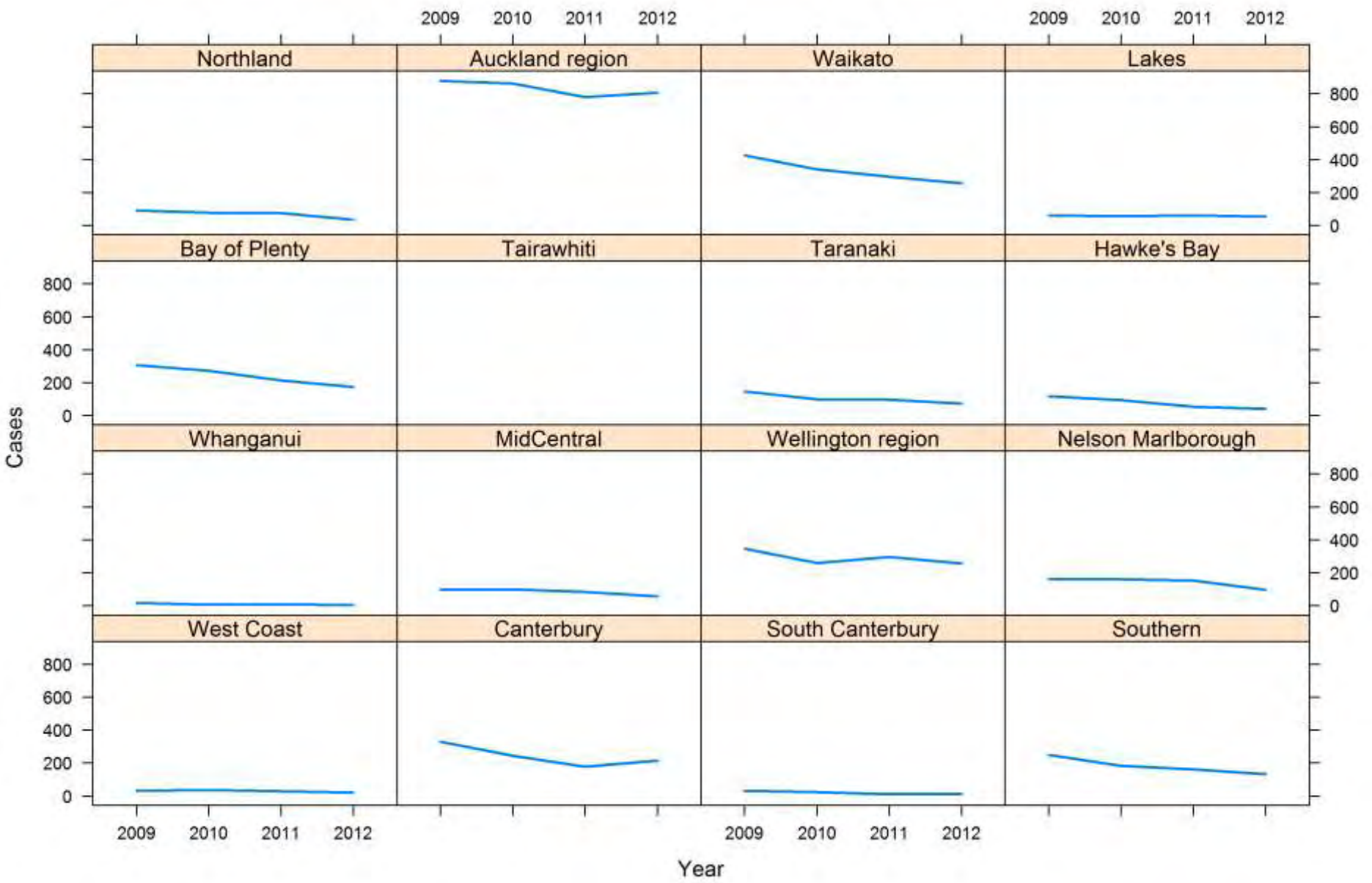
District Health Board	Clinic type		Total
	SHC	FPC	
Northland	35	0	35
Auckland region[a]	807	65	872
Waikato	255	11	266
Lakes	53	-	53
Bay of Plenty	173	0	173
Tairawhiti	0	5	5
Taranaki	72	0	72
Hawke's Bay	42	-	42
Whanganui	5	3	8
MidCentral	58	-	58
Wellington region[b]	257	59	316
Nelson Marlborough	98	39	137
West Coast	20	4	24
Canterbury	214	34	248
South Canterbury	11	4	15
Southern	131	31	162

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 2012 are presented by DHB in Figure 49. SHCs in all DHBs have reported decreasing case numbers of genital warts over the four-year period.

Figure 49: Genital warts case numbers in SHCs by DHB, 2009–2012



* Data was not available for Tairawhiti DHB for 2009–2012

Sex, age and ethnicity distribution of genital warts

2012 analysis

Sex was recorded for all of the genital warts cases except one in 2012. More cases of genital warts were seen in males than females at SHCs (58.4%, 1302/2231). By contrast, more cases of genital warts were seen in females than males at FPCs (69.8%, 178/255) (Table 28). The difference in sex distribution between SHCs and FPCs reflects the high proportion of female attendees at FPCs (in 2012, the male to female ratio of attendees at FPCs was 1:25).

Table 28: Genital warts (first presentation) cases by sex and clinic type, 2012

Sex	Clinic type	
	SHC	FPC
Male	1302	77
Female	928	178
Total	**2231**	**255**

Age was recorded for 99.9% (2230/2231) of genital warts cases. In SHCs, 43.8% (976/2231) 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 (72.0%, 183/255) than in SHCs. The mean age of cases of genital warts was 28.7 years in SHCs and 23.3 years in FPCs.

The number of cases in both females and males with genital warts was highest in the 20–24 years age group across both clinic types (313 cases in SHCs and 66 cases in FPCs, 389 cases in SHCs and 38 cases in FPCs, respectively). Figure 50 and Figure 51 present the number of genital warts cases reported by age group and sex for SHCs and FPCs for 2012.

Figure 50: Number of cases of genital warts reported by SHCs by age group and sex, 2012

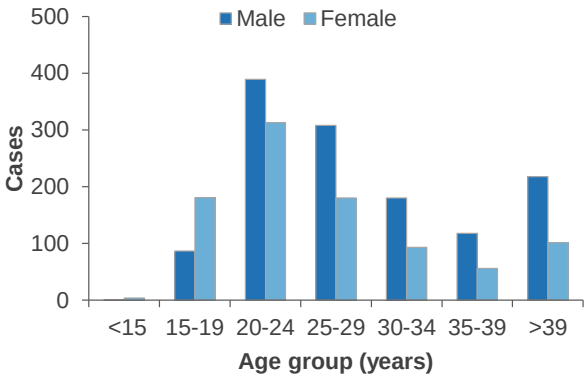


Figure 51: Number of cases of genital warts reported by FPCs by age group and sex, 2012

Ethnicity was recorded by SHCs for 96.5% (2152/2231) of the reported cases of genital warts. The highest percentage of cases reported by SHCs were of European ethnicity (69.9%, 1504 cases), followed by Māori (15.7%, 338 cases), Other (9.7%, 208 cases) and Pacific Peoples (4.7%, 102 cases) ethnicity. Ethnicity was recorded by FPCs for 95.3% (243/255) of the reported cases. The highest percentage of cases reported by FPCs were of European ethnicity (79.0%, 192 cases), followed by Māori (14.4%, 35 cases), Pacific Peoples (4.1%, 10 cases) and Other (2.5%, 6 cases) ethnicity.

Table 29 presents the number of genital warts cases by ethnicity and clinic setting for 2012.

Table 29: Genital warts (first presentation) cases by ethnicity and clinic type, 2012

Ethnicity	Clinic type	
	SHC	FPC
European	1504	192
Māori	338	35
Pacific Peoples	102	10
Other	208	6
Unknown	79	12
Total	**2231**	**255**

Trends in sex, age and ethnicity

Between 2009 and 2012 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 52). Case numbers remained stable over the four-year period for all other age groups in males and females. In FPCs, notable decreases were observed among females in the 15–19 years age group, as well as in 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 53).

Figure 52: Number of genital warts (first presentation) cases in SHCs by sex and age group, 2009–2012

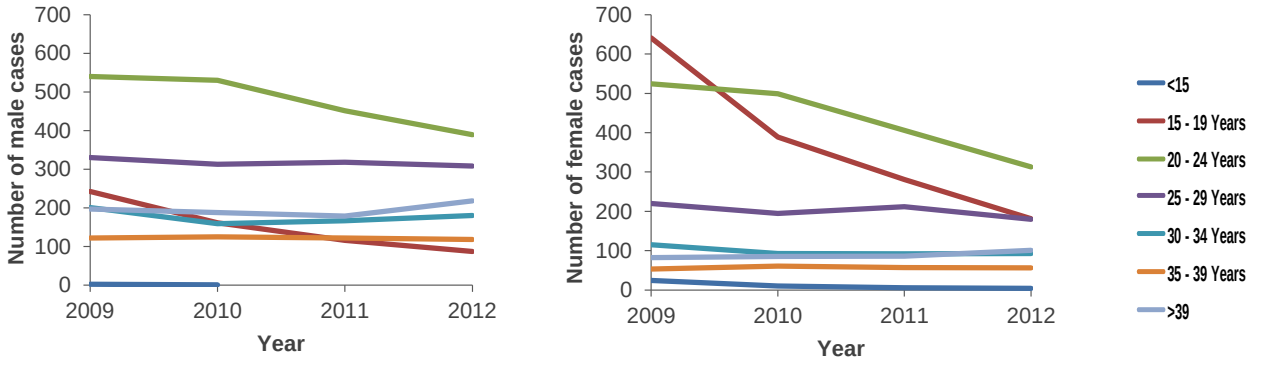


Figure 53: Number of genital warts (first presentation) cases in FPCs by sex and age group, 2009–2012

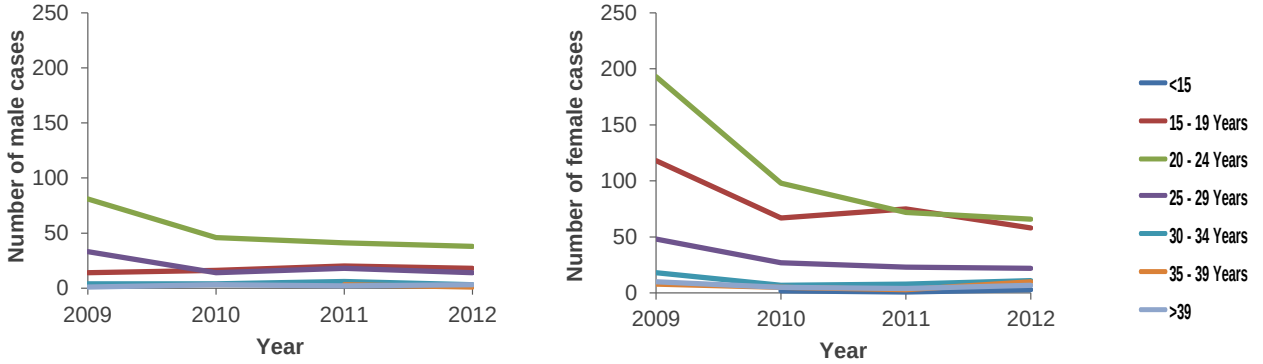


Figure 54 and Figure 55 present genital warts case numbers reported from SHCs and FPCs by ethnicity between 2009 and 2012. In SHCs, there was a decrease in diagnoses in all ethnic groups. In FPCs, the number of diagnoses in every ethnic group decreased between 2009 and 2010 but remained stable in the following years.

Figure 54: Number of genital warts (first presentation) cases reported from SHCs by ethnicity, 2009–2012

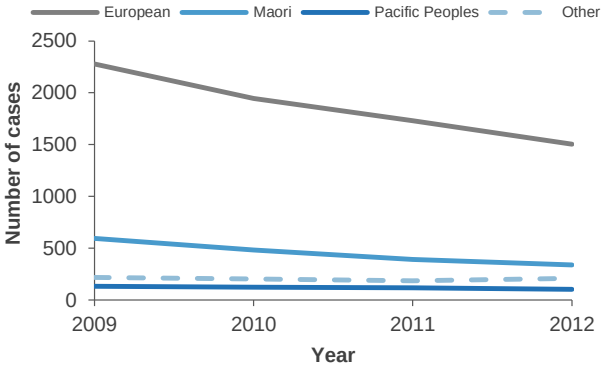
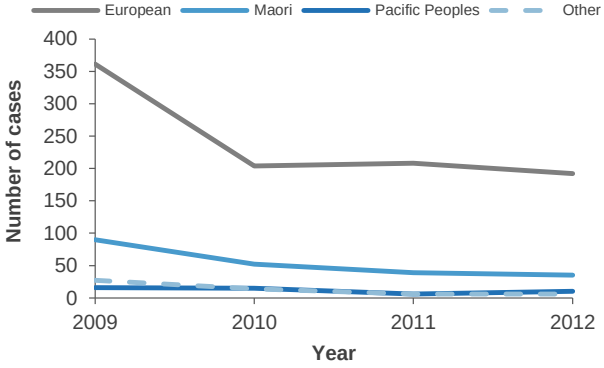


Figure 55: Number of genital warts (first presentation) cases reported from FPCs, by ethnicity, 2009–2012



INFECTIOUS SYPHILIS

INFECTIOUS SYPHILIS

Key findings

- In 2012, 80 syphilis cases were reported (all in SHCs).
- The majority of cases were seen in Auckland (33 cases) and Canterbury (28 cases).
- There has been a steady decline in syphilis cases since a peak of 135 cases in 2009.
- Males comprised 93.8% 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, can occur for at least four years, whereas sexual transmission usually occurs for one year [10]. Only cases of infectious syphilis (primary, secondary and early latent) are reported by clinics for surveillance purposes.

Clinic surveillance of infectious syphilis

National analysis

2012 analysis

In 2012, 80 cases of infectious syphilis were reported by SHCs and no cases were reported by FPCs (Table 30).

Table 30: Infectious syphilis case numbers by clinic type, 2012

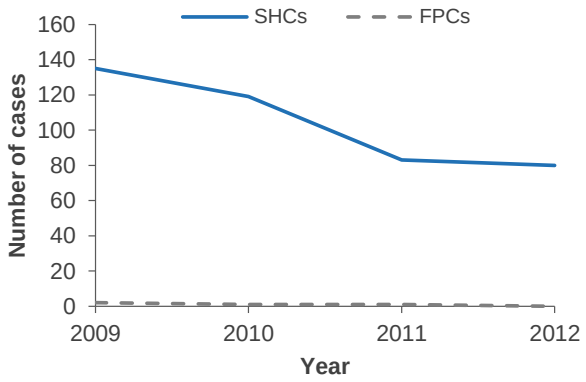
Clinic type	Total number of cases
SHC	80
FPC	0
Total	**80**

Trends in national totals

Between 2011 and 2012, the infectious syphilis case count reported by SHCs decreased by 3.6% (from 83 to 80 cases).

From 2009 to 2012, the infectious syphilis clinic case count reported by SHCs decreased by 40.7% (from 135 to 80 cases) (Figure 56).

Figure 56: Infectious syphilis case numbers by clinic type, 2009–2012



DHB counts

2012 analysis

Clinics in 19 DHBs contributed to infectious syphilis surveillance in 2012. The numbers of infectious syphilis cases seen in SHCs by DHB are presented in Table 31. The highest case numbers of syphilis in SHCs were seen in Auckland (33 cases) and Canterbury (28 cases) regions.

Trends in DHB counts

Between 2009 and 2012 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 halved to 33 cases in 2012. The number of syphilis cases reported in the Wellington region steadily decreased between 2009 and 2012 from 42 to 7 cases. Canterbury SHC reported high case numbers in 2009 and 2012 (31 and 28 cases, respectively). However, in 2010 and 2011 Canterbury SHC reported relatively few syphilis cases (8 and 3 cases, respectively).

Table 31: Infectious syphilis case numbers in SHCs by DHB, 2012

District Health Board	Cases
Northland	0
Auckland region[a]	33
Waikato	3
Lakes	1
Bay of Plenty	3
Tairawhiti	0
Taranaki	1
Hawke's Bay	0
Whanganui	0
MidCentral	2
Wellington region[b]	7
Nelson Marlborough	1
West Coast	0
Canterbury	28
South Canterbury	1
Southern	0

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

Sex, age and ethnicity distribution of syphilis

2012 analysis

Sex and age were recorded for all cases of infectious syphilis. Of these, 75 (93.8%) cases were male and five (6.2%) cases were female (Table 32).

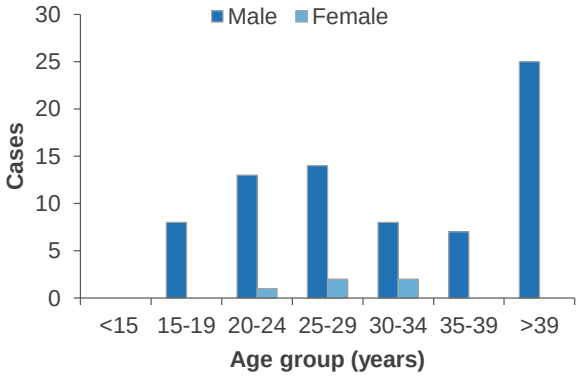
Table 32: Infectious syphilis case numbers by sex and clinic type, 2012

Sex	Clinic type	
	SHC	FPC
Male	75	0
Female	5	0
Total	**80**	**0**

A large proportion (72.5%, 58/80) of the reported syphilis cases were aged 25 years and over, with a mean age of 33.6 years (range: 18–76 years).

The number of males with syphilis was highest in the 39 years and over age group (25 cases). For females, syphilis case numbers were low and occurred in the 20–24 years age group (1 case) and in the 25–29 years and 30–34 years age groups (2 cases each). Figure 57 presents the number of syphilis cases reported by SHCs by age group and sex for 2012.

Figure 57: Infectious syphilis case numbers reported by SHCs by age group and sex, 2012



Ethnicity was recorded for 93.8% (75/80) of the reported cases of syphilis. The highest percentage of cases were of European ethnicity (72.0%, 54 cases), followed by Māori and Other (13.3% each, 10 cases each) and Pacific Peoples (1.3%, 1 case) ethnicity (Table 33).

Table 33: Infectious syphilis case numbers by ethnicity and clinic type, 2012

Ethnicity	Clinic type	
	SHC	FPC
European	54	0
Māori	10	0
Pacific Peoples	1	0
Other	10	0
Unknown	5	0
Total	**80**	**0**

Trends in sex, age and ethnicity

Between 2009 and 2012, a notable decrease in the syphilis case numbers in males in SHCs in the 39 years and over age group occurred (from 52 to 25 cases) (Figure 59). During the four-year period, case numbers in females attending SHCs were low compared with males. The highest number of cases in females was seen in the 40 years and over age group.

Figure 58 presents syphilis case numbers reported from SHCs by ethnicity between 2009 and 2012. Between 2009 and 2011 there was a steady decrease in case numbers in the European ethnic group (from 70 to 38 cases), but since 2011 there has been an increase in case numbers in this group (from 38 to 54 cases). Case numbers in Māori have remained low over the four-year period and case numbers in the Pacific Peoples and Other ethnic groups have decreased (from 14 to 1 case and 33 to 10, respectively).

Figure 58: Infectious syphilis case numbers reported from SHCs by ethnicity, 2009–2012

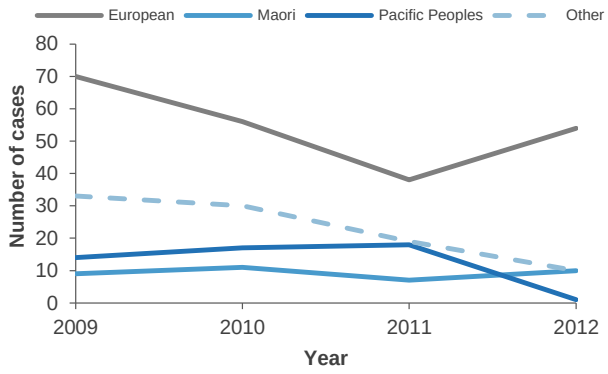
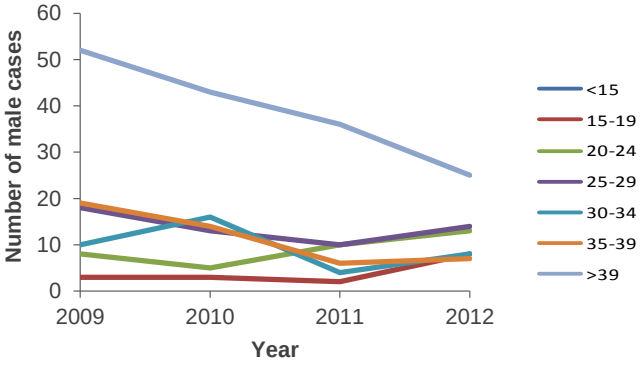


Figure 59: Number of Infectious syphilis cases in SHCs in males by age group, 2009–2012



NON-SPECIFIC URETHRITIS

NON-SPECIFIC URETHRITIS

Key findings

- In 2012, 660 cases of NSU were reported, with 651 cases seen in SHCs.
- Between 2011 and 2012, the number of NSU cases seen in SHCs increased by 8.1%.
- The mean age of males with NSU in SHCs was 31.7 years in 2012.

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

2012 analysis

In 2012, the clinic counts for NSU reported by SHCs and FPCs were 651 cases and 9 cases respectively (Table 34).

Table 34: NSU case numbers by clinic type, 2012

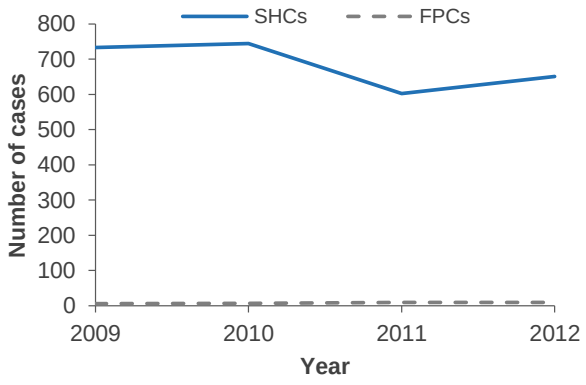
Clinic type	Total number of cases
SHC	651
FPC	9
Total	**660**

Trends in national totals

Between 2011 and 2012, NSU case counts reported by SHCs increased by 8.1% (from 602 to 651 cases). The number of cases reported by FPCs remained the same (9 cases).

From 2009 to 2012, NSU case counts decreased by 11.2% in SHCs (from 733 to 651 cases) (Figure 60). NSU case counts in FPCs have remained low over the four-year period.

Figure 60: NSU cases by clinic type, 2009 to 2012



DHB counts

2012 analysis

Clinics in 19 DHBs contributed to NSU surveillance in 2012. The numbers of NSU cases in SHCs by DHB are presented in Table 35. The highest number of NSU cases in SHCs were seen in the Auckland (301 cases) and Wellington (87 cases) regions.

Table 35: NSU case numbers in SHCs by DHB, 2012

District Health Board	Cases
Northland	0
Auckland region[a]	301
Waikato	58
Lakes	0
Bay of Plenty	52
Tairawhiti	0
Taranaki	27
Hawke's Bay	0
Whanganui	0
MidCentral	20
Wellington region[b]	87
Nelson Marlborough	13
West Coast	3
Canterbury	78
South Canterbury	4
Southern	8

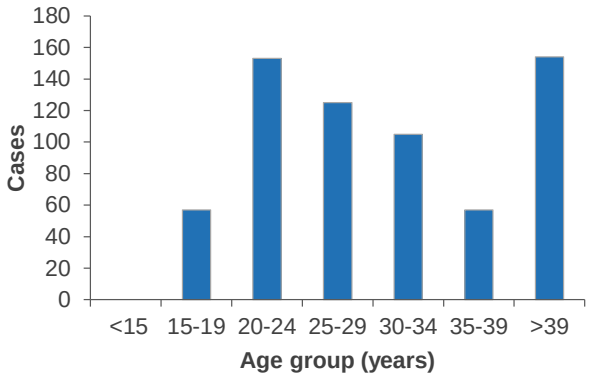
a Waitemata, Auckland and Counties Manukau DHBs
b Hutt Valley and Capital & Coast DHBs

Age and ethnicity distribution of NSU

2012 analysis

Age was recorded for all NSU cases in 2012. In SHCs, 32.3% (210/651) of the reported cases of NSU were aged less than 25 years. The proportion of cases aged less than 25 years was larger in FPCs (66.7%, 6/9). The mean age of NSU cases was 31.7 years in SHCs and 24.7 years in FPCs. Figure 61 presents the number of NSU cases reported by age group and sex for SHCs in 2012.

Figure 61: NSU case numbers reported by SHCs by age group, 2012



In SHCs, ethnicity was recorded for 97.1% (632/651) of the reported cases of NSU. The highest percentage of cases were of European ethnicity (69.8%, 441 cases), followed by Māori (12.5%, 79 cases), Other (11.7%, 74 cases) and Pacific Peoples (6.0%, 38 cases) ethnicity (Table 36).

Table 36: NSU cases numbers by ethnicity and clinic type, 2012

Ethnicity	Clinic type	
	SHC	FPC
European	441	3
Māori	79	5
Pacific Peoples	38	0
Other	74	1
Unknown	19	0
Total	**651**	**9**

Trends in age and ethnicity

From 2009 to 2012, case numbers decreased in every age group except in the 39 years and over age group, where case numbers increased (from 149 to 154 cases) (Figure 58). Case numbers were very low in the under 15 years age group.

Figure 62: Number of NSU cases in SHCs in males by age group, 2009–2012

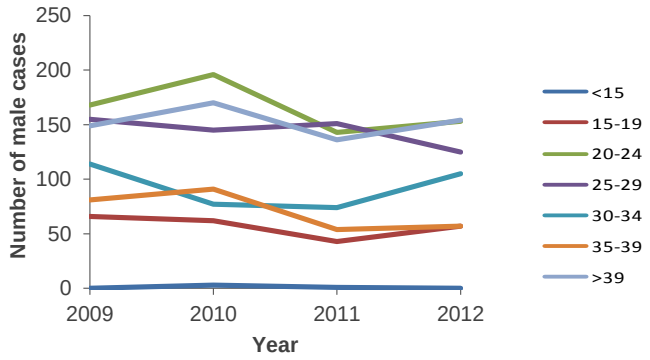
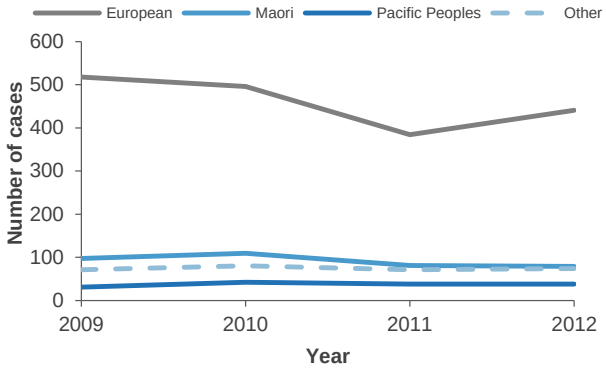


Figure 63 presents NSU case numbers reported from SHCs by ethnicity between 2009 and 2012. Since 2009, case numbers in the European ethnic group have decreased (from 518 to 441 cases), and in Māori (from 97 to 79 cases). However, case numbers have increased in Pacific Peoples (from 31 to 38 cases) and Other (from 71 to 74 cases) ethnic groups.

Figure 63: Number of NSU cases reported from SHCs, by ethnicity, 2009–2012



DISCUSSION

DISCUSSION

Chlamydia

Chlamydia was the most commonly reported STI in New Zealand in 2012. The laboratory-based estimated national chlamydia rate had been stable between 2009 and 2011, but decreased in 2012. It is too soon to know whether the decrease will continue in future years.

It is interesting to note that the rate of chlamydia in females in the 15–19 years age group (the group with the highest rate at the national level) has shown a steady decline since 2009. Whether this reflects a true reduction in the burden of chlamydia, a shift toward testing those at lower risk, or a decrease in testing in this age group cannot be determined from current surveillance data. The total number of chlamydia tests being performed increased by two percent since 2009 but testing data was not available by age group.

Gonorrhoea

The estimated national rate of gonorrhoea increased in 2012 by around a third following the introduction of NAAT for gonorrhoea testing in many laboratories in 2011 and 2012. The long-term downward trend in gonorrhoea rates continued in the Waikato and Lakes/Bay of Plenty regions, regions that have not yet introduced NAAT. This data indicates that the increase in the national rate 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. The sharp increase in the female 15–19 years age group and the smaller increases in other age groups in 2012 is also likely to have resulted from greater use of NAAT. However, this cannot be confirmedfrom the current surveillance data.

As in 2011, Tairawhiti DHB stood out with a laboratory-based gonorrhoea rate more than four 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.

In 2012, the World Health Organization released an action plan in response to growing concerns about antimicrobial resistant gonorrhoea, especially emerging resistance to ceftriaxone[11] . No ceftriaxone resistance has been detected among *Neisseria gonorrhoeae* in New Zealand as yet. However, isolates with reduced susceptibility to ceftriaxone have been confirmed from the Auckland region. Improved surveillance of the antimicrobial susceptibilities of *N. gonorrhoeae* isolates in New Zealand is being implemented in 2013 with many laboratories now 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 2012. This decrease was most notable in females aged 15–19 years, although decreases 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 [12]. 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 [13].

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 [14]. In recent syphilis outbreaks overseas, high rates of HIV co-infection were documented, ranging from 20 to 70 percent [15].

There was a marked increase in cases in Canterbury in 2012, with 28 cases reported compared with three cases in 2011. Overall, however, 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 2012. 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 ongoing 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 94 chlamydia cases and two gonorrhoea cases aged less than one year in 2012. 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.
- The New Zealand chlamydia and gonorrhoea rates are based on data from many but not all of the laboratories in New Zealand. As rates vary geographically within New Zealand, the surveillance data may not be representative of the overall New Zealand rate.

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

The estimated national chlamydia rate for New Zealand in 2012 (745 per 100 000 population) was approximately one and half- to two-times higher than the national chlamydia rates most recently published for Australia (364 per 100 000 population in 2011), the United Kingdom (343 per 100 000 population in 2011) and the United States (458 per 100 000 population in 2011). For gonorrhoea, the estimated national rate for New Zealand in 2012 (89 per 100 000 population) was higher than the national rates observed in Australia (60 per 100 000 population in 2011) and the United Kingdom (37 per 100 000 population in 2011), but lower than the rate in the United States in 2011 (104 per 100 000 population) [16-18] .

STI surveillance system limitations and improvements

DHB reporting was still not possible for five DHBs for chlamydia and three DHBs for gonorrhoea in 2012. This meant that the national rates of chlamydia and gonorrhoea for New Zealand remain as estimates. However, additional laboratories are now participating in STI surveillance and it is expected that all DHBs will meet the selection criteria for reporting next year. 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.

Although estimated rates of chlamydia and gonorrhoea are reported for New Zealand and by age, sex, and DHB, calculation of population-based rates by ethnicity are not currently possible. Information on the burden of STIs by ethnicity has so far relied on count data from clinic sources. In 2013, changes to laboratory surveillance should allow for a number of improvements, most critically, the association of an ethnicity with STI tests. This will allow rates by ethnic group to be estimated for both chlamydia and gonorrhoea. In addition, enhanced data on negative STI tests will broaden the scope for reporting testing rates and test positivity rates.

Another improvement to STI surveillance is being implemented through Family Planning in 2013. The reason for attendance at the clinic will be provided for all Family Planning cases. This will provide an insight into the prevalence of STIs in certain population groups.

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. Further work with SHCs will be required to enable this data to be collected and reported.

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 2012, decreases were observed for most of the STIs under surveillance. The most noticeable exception is gonorrhea where a 35% 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.

A number of changes to STI surveillance are planned for the 2013 year, which should further increase the utility of STI surveillance data.

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APPENDICES

Appendix A: 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 [19]. Surveillance is an important part of the strategy to reduce the short and long term burden of sexually transmitted infections [20]. New Zealand's STI surveillance system has five identified purposes [21]:

- 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

SHCs have participated in STI surveillance since 1988, with ESR taking a national co-ordinating role from 1995. Initially sexual health clinics 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 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 incidence 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). Surveillance via SYHCs was discontinued during 2012, but Family Planning will provide additional data from 2013. FPCs will state the reason why tests are undertaken, which 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, has yet to be determined, but will only be possible through reporting from clinics. Upcoming 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. 2012 was the first year in which all DHBs had at least one laboratory that provided STI surveillance data (see Appendix H: 2012 participation map).

During 2013, ESR will be working with laboratories on further measures to enhance the surveillance of STIs. We plan to collect data elements that will allow the ethnicity of those having STI tests to be determined. Ethnicity information is particularly important to document and monitor the higher burden of STIs indicated in Māori and Pacific populations. Ideally, we will also extend laboratory surveillance to all specimens tested, enabling testing and positivity rates in different population groups to be established.

Appendix B: Methods

All results and analyses are based on data submitted prior to 12 March 2013. Any data submitted after this date will be reflected in subsequent annual reports.

Data collection

Laboratories

The participating laboratories (see Appendix F) report 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. Laboratories only report specimens received directly from health care settings. The diagnostic tests used by each laboratory may differ.

With current laboratory data and reporting practice it is not possible to determine the total number of positive individuals and specimens. An attempt has 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 test-positive specimen was equivalent to one test-positive 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 here.

Each month, laboratories send data directly to ESR. Laboratory data are entered into a database by ESR staff.

Data on ceftriaxone, ciprofloxacin, penicillin and tetracycline resistance among *N. gonorrhoeae* isolates are collected annually from community and hospital diagnostic microbiology laboratories, and collated at ESR to provide national estimates of resistance to these four antibiotics.

Clinics

Clinics record anonymous data on the age, sex and ethnicity (Māori, Pacific Peoples, European, Other, or unknown) of 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 37.

Table 37: 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

STI surveillance data from the above-mentioned sources are stored in separate clinic and laboratory databases and are extracted and analysed using Microsoft Access and Excel, and R [22].

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 test-positive reported cases for chlamydia and gonorrhoea. The total number of tests performed in each DHB is also used for chlamydia and gonorrhoea testing rates.

Denominator data

Laboratory rates: the denominator for the calculation of DHB 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 2012 and the four-year estimated national rates trend analyses adjusts for the fact that we have data from most, but not all DHBs [23]. 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 four-year period (2009–2012) was reported for laboratory surveillance trends, except for the DHB analyses where a five-year period (2008–2012) was reported and for the three-region analyses where a 15-year period (1998–2012) was reported. The previous years report (2011) included a six-year period of reporting for clinic surveillance trends, however, a four-year period (2009–2012) was used this year to ensure consistency across different reporting variables.

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. 2012 analysis, including estimated national rate: each laboratory in the DHB must have provided data for all 12 months of 2012.
2. Trend analyses: these rates enable comparison of national rates between years. For a DHB to be included in the national rate trend analysis, all laboratories in the selected DHB must have provided data for the 12 months of each of the last four years.
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: Laboratories with a large percentage of specimen sites recorded as unknown were excluded from the specimen site analysis. This is in addition to the 2012 analysis and trend analyses criteria stated above.

Where a community laboratory carried out testing for more than one DHB, these DHBs have been combined for reporting purposes, that is, Auckland, Waitemata and Counties Manukau DHBs (Labtests), and Hutt Valley and Capital & Coast DHBs (Aotea Pathology).

Table 38 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 38: Selected/excluded DHBs by analysis type and STI

District Health Board	Annual analysis 2012		National rate trend analysis		Individual DHB trend analysis	
	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea
Northland	✓	✓	✓	✓	✓	✓
Auckland region[a]	✓	✓	✓	✓	✓	✓
Waikato	✓	✓	✓	✓	✓	✓
Lakes	✓	✓	✓	✓	✓	✓
Bay of Plenty	✓	✓	✓	✓	✓	✓
Tairawhiti	✓	✓	✓	✓	✓[1]	✓
Taranaki	✓	✓	✓	✓	✓	✓
Hawke's Bay	✓	✓	✓	✓	✓	✓
Whanganui	✓	✓	✓	✓	✓[1]	✓[1]
MidCentral	✓	✓	✓	✓	✓	✓
Wellington region[b]	×	✓	×	✓	×	✓
Wairarapa	✓	✓	✓	✓	✓[1]	✓[1]
Nelson Marlborough	×	×	×	×	×	×
West Coast	✓	✓	✓	✓	✓	✓
Canterbury	×	×	×	×	×	×
South Canterbury	×	×	×	×	×	×
Southern	✓	✓	✓	✓	✓	✓

a Waitemata, Auckland and Counties Manukau DHBs
b Hutt Valley and Capital & Coast DHBs
✓ = Selected × = Excluded
[1] 2009–2012 only

Appendix C: Laboratory and clinic participation and data completeness

Clinics

In 2012, 28 SHCs and 32 FPCs across New Zealand voluntarily participated in the STI surveillance programme. 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 2012, 43 laboratories across 20 DHBs in New Zealand voluntarily participated in the STI surveillance programme. Of these, 43 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 (Appendix B).

Appendix D: Clinic visits

Sexual health clinics

SHCs reported 79 430 clinic visits during 2012, 58.7% (46 595 visits) of which were by females. Between 2011 and 2012, the number of clinic visits decreased by 3.0% (from 81 928 visits in 2011 to 79 430 visits in 2012).

Where information about age and ethnicity was provided, 45.5% (36 069 visits) were by attendees aged less than 25 years, 60.7% (47 410 visits) were European, 23.4% (18 254 visits) were Māori, 4.9% (3 837 visits) were Pacific Peoples and 11.0% (8558 visits) were of Other ethnicity.

Family planning clinics

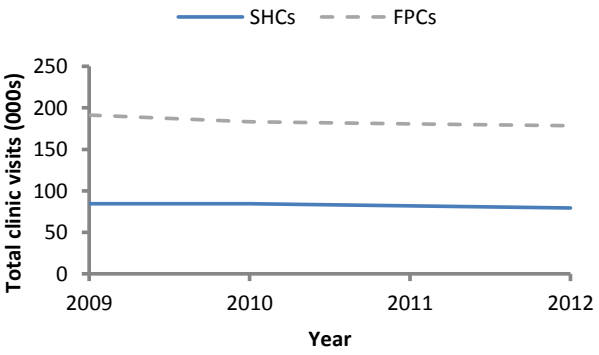
FPCs reported 178 508 clinic visits during 2012, 95.8% (170 982 visits) of which were by females. Between 2011 and 2012, the number of clinic visits decreased by 1.2% (from 180 671 visits in 2011 to 178 508 visits in 2012).

Where age and ethnicity information was provided, 60.2% (107 478 visits) were by attendees aged less than 25 years, of whom 70.6% (118 250 visits) were European, 16.1% (26 931 visits) were Māori, 5.0% (8 448 visits) were Pacific Peoples and 8.2% (13 809 visits) were of Other ethnicity.

Trends in clinic visits

Over the four year period between 2009 and 2012 there was stability in the number of clinic visits annually to SHCs and FPCs

Figure 64: Total clinic visits by clinic type, 2001–2012



Appendix E: 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 are not standardised across New Zealand laboratories, with some laboratories predominantly using NAAT and others using culture predominantly or entirely. These tests have different sensitivities and specificities that may influence the data. Notably, increases in DHB gonorrhoea rates become evident in the surveillance data after the main or sole DHB testing laboratory starts to use NAAT predominantly.

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 2012, 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 2012 are included if a clinic met the 10 out of 12 month inclusion criteria for 2012; the completeness of a clinic's data over the previous three years is not considered. Therefore, year-on-year comparisons for this period are reasonably valid, although caution is advised.

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 data completeness section). Similarly, the New Zealand rates (estimated national rates) reported from 2009 to 2012 were calculated using a set of DHBs who had complete data for all four years. Therefore, year-on-year comparisons using the laboratory data are also valid, but the influence of the introduction of NAAT on any observed trend must be considered.

Appendix F: 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 G: List of participating laboratories

In 2012 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 (chlamydia only)
- 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
- Grey Hospital Laboratory, West Coast
- Canterbury Health Laboratories, Canterbury
- Christchurch Southern Community Laboratory, Canterbury
- Ashburton Southern Community Laboratory, Canterbury
- Medlab South, 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 H: Maps of STI laboratory surveillance coverage for chlamydia and gonorrhoea, 2012

Figure 65: Laboratory surveillance coverage for chlamydia by DHB, 2012

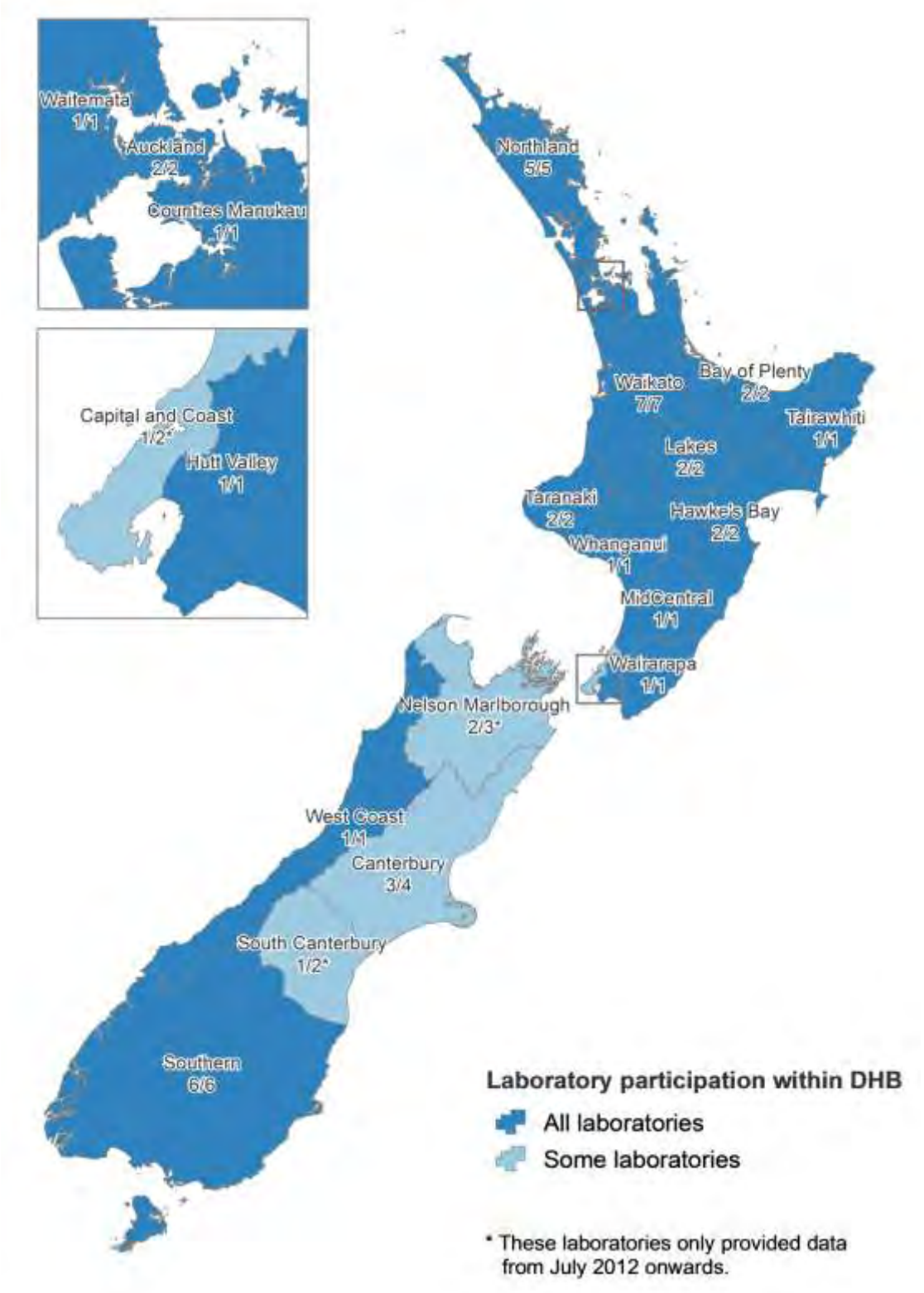


Figure 66: Laboratory surveillance coverage for gonorrhoea by DHB, 2012