



# Sexually transmitted infections in New Zealand

## 2011

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

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## SUMMARY



## SUMMARY

In New Zealand, sexually transmitted infections (STIs) are not notifiable. Therefore, surveillance efforts are based on the voluntary provision of data from several different sources (sexual health clinics (SHCs), family planning clinics (FPCs), student and youth health clinics (SYHCs) and laboratories). Population and disease coverage varies with the data source.

This report summarises the surveillance information for STIs in 2011, and examines trends over time. It covers the STIs of public health importance, including 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 2011, it was estimated that laboratory surveillance reported approximately three and a half-times the number of chlamydia cases and almost three-times the number of gonorrhoea cases reported by clinic surveillance.

SHCs also provide important information on the epidemiology of STIs. The reasons for this include the stability of the number of SHCs across New Zealand, the number of clinics participating in the surveillance programme, and the availability of ethnicity data. 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 based on laboratory surveillance data. In 2011, DHB rates were not calculated for a number of DHBs (five for chlamydia and three for gonorrhoea) due to lack of data.

### Chlamydia

Chlamydia was the most commonly reported STI in 2011 in both the laboratory and clinic settings. A national estimated chlamydia rate (based on 15 DHBs) of 786 per 100 000 population was calculated from laboratory surveillance data. Over 70% of cases reported through laboratory surveillance data were aged between 15 and 24 years, and there were 105 cases of chlamydia in infants.

In data derived from SHCs, over 55% 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 2011, Tairāwhiti, Lakes and Hawke's Bay DHBs reported the highest chlamydia rates.

For both SHCs and SYHCs, the number of reported cases of chlamydia increased between 2006 and 2011. In contrast, FPCs reported a decrease in the number of cases over the same time period. Laboratory surveillance data showed the chlamydia estimated national rate between 2008 and 2011 (based on 12 DHBs) remained relatively stable.

### Gonorrhoea

In 2011, a national gonorrhoea rate (based on 17 DHBs) of 67 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 there were two cases of gonorrhoea in infants. In SHCs, over 58% 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 2011, Tairāwhiti DHB reported the highest gonorrhoea rate, over five-times the estimated national rate.

Between 2008 and 2011, there was an overall decrease of 11.3% in the gonorrhoea estimated national rate (calculated based on laboratory data from 13 DHBs). A decrease was also seen in gonorrhoea cases diagnosed in SHCs, FPCs and SYHCs during the same four year period.

### Syphilis

The number of cases of syphilis reported by SHCs again decreased, from 119 cases in 2010 to 82 cases in 2011. One additional case was reported by a FPC. The SHC cases were predominantly male (83.1%) and occurred most commonly in the 40 years and over age group. Forty six percent of the cases were European and 24% of the cases were from the Other ethnic group.

### Other STIs

From 2010 to 2011, SHCs reported a decrease in case counts of genital warts and non-specific urethritis (NSU) (by 10.9%, and 17.4%, respectively) and an increase in genital herpes case counts (2.7%). The same pattern was seen in the six-year trend; genital warts and NSU showed a decrease in case counts (10.6%, and 1.8%, respectively) and there was an increase in genital herpes cases (38.3%).

No cases of chancroid, granuloma inguinale and lymphogranuloma venereum were reported in 2011.



# INTRODUCTION



## ABOUT THIS REPORT

The *Sexually transmitted infections in New Zealand: Annual Surveillance Report* takes a new format this year as part of a series of planned improvements to the surveillance of STIs.

One of the most obvious changes to the format this year is that surveillance results are presented by disease rather than reporting source. This reflects a new direction where laboratory and clinic surveillance is designed to give complementary information to present a picture of chlamydia and gonorrhoea in New Zealand. Genital herpes, genital warts, syphilis, NSU, chancroid, GI and LGV surveillance continues as solely clinic based.

This year new analyses have been added to the report. These additions include male to female ratios in test-positive laboratory cases and clinic-based ethnicity trends. Surveillance methods and notes for interpreting the results can be found in the appendices.

During 2012 ESR will be working with clinics and laboratories on measures to enhance STI surveillance. ESR plans to work with laboratories to collect ethnicity information, important particularly to understand the higher rates of STIs in Māori and Pacific peoples populations. Sexual Health Clinics are investigating providing risk behaviour information, such as sex of partner, to enhance knowledge about STIs in MSM, another group with a high burden of disease. Family Planning Clinics are exploring the feasibility of providing indications for STI testing. All this will be done 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 to all clinics and diagnostic laboratories that contribute regularly to STI surveillance.

This report is available electronically at [http://www.surv.esr.cri.nz/surveillance/annual\\_sti.php](http://www.surv.esr.cri.nz/surveillance/annual_sti.php). A slide set containing selected figures from this years report is also available at this website.





# CHLAMYDIA



# CHLAMYDIA

## Key findings

- In 2011, the estimated national chlamydia rate was 786 cases per 100 000 population.
- The female/male ratio was 2.8 for laboratory diagnosed cases of chlamydia.
- Chlamydia is most commonly diagnosed in females in the 15 to 19 years age group and in males in the 20 to 24 years age group in both the laboratory and clinic settings.

In 2011, 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 2011 analysis

In 2011, 39 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 25 666 patients. The estimated national chlamydia rate, based on 15 DHBs, was 786 per 100 000 population (95% confidence interval (CI) [753, 819]).

Fifteen DHBs met the selection criteria for individual analysis in 2011 (Appendix B). The highest numbers of test-positive chlamydia cases were seen in the Auckland region (11 062 cases) and Waikato DHB (2883 cases). The highest rate of chlamydia cases was reported for Tairāwhiti DHB (1510 per 100 000, 703 cases), followed by Lakes (1265 per 100 000, 1321 cases) and Hawke's Bay (1006 per 100 000, 1560 cases) DHBs.

**Table 1: Number of test-positive chlamydia cases and population rates by DHB, 2011**

District Health Board	Number of test-positive cases	Rate per 100 000 population
Northland	1 393	881
Auckland region <sup>a</sup>	11 062	736
Waikato	2 883	785
Lakes	1 321	1 265
Bay of Plenty	1 777	839
Tairāwhiti	703	1 510
Taranaki	682	621
Hawke's Bay	1 560	1 006
Whanganui	479	777
MidCentral	1 182	701
Wairarapa	225	555
West Coast	163	498
Southern	2 236	731
Other <sup>b</sup>	1 384	-
<b>Total<sup>c</sup></b>	<b>25 666</b>	<b>786</b>

a Waitemata, Auckland and Counties Manukau DHBs

b Data from DHBs where selection criteria were not met

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

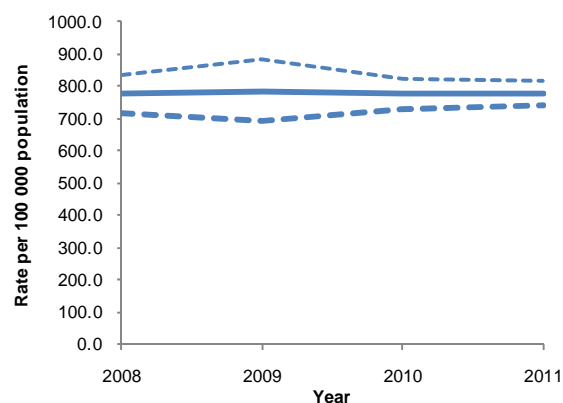
### Trends in laboratory diagnoses

#### 1. National rate trend analysis

Twelve DHBs met the selection criteria for the estimated national rate trend analysis for chlamydia (Appendix B). Between 2010 and 2011, the chlamydia estimated national rate varied little (776 to 779 per 100 000 population). From 2008 to 2011, there was also little variation in the chlamydia

estimated national rate (776 to 779 per 1000 population). The estimated chlamydia national rates from 2008 to 2011, with 95% confidence interval indicated, are shown in Figure 1.

**Figure 1: Estimated national chlamydia rate, 2008 to 2011**



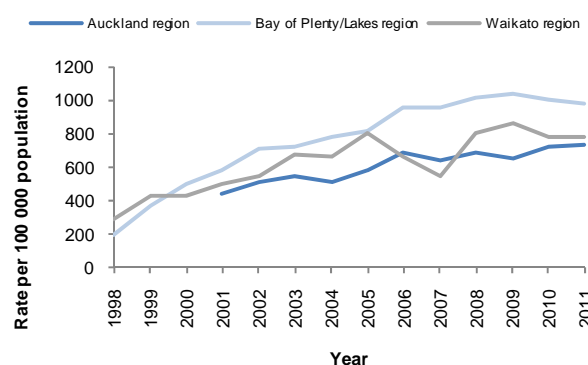
#### 2. Individual DHB trend analysis

Fifteen DHBs met the selection criteria for the individual DHB trend analysis. From 2007 to 2011, the chlamydia rate varied among DHBs and across years. Notable trends over this period are that Tairāwhiti and Lakes DHBs experienced increasing rates, while Bay of Plenty and Taranaki DHBs experienced decreasing rates. Chlamydia rates by DHB from 2007 to 2011 are shown in Figure 3.

#### 3. Three regions analysis

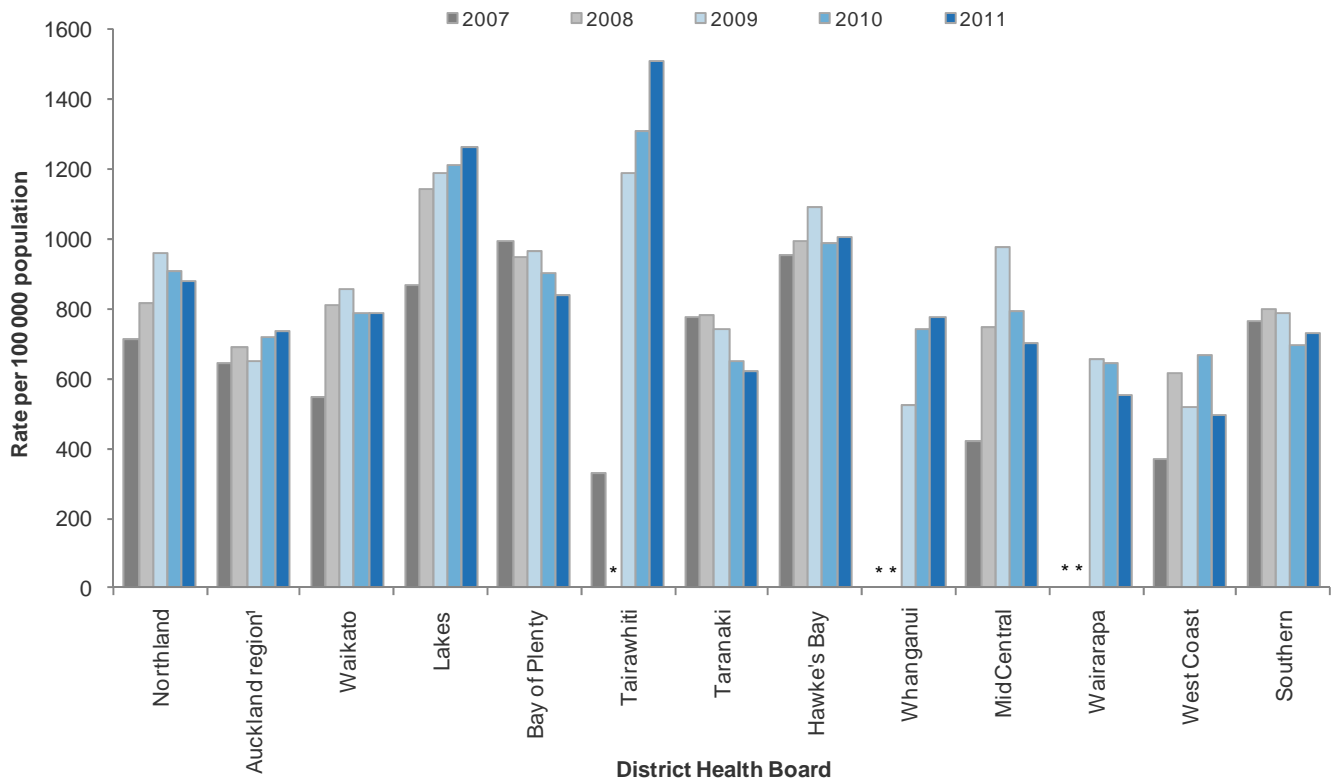
Laboratory data on chlamydia has been collected from laboratories in Waikato, Lakes and Bay of Plenty DHBs since 1998 and in the Auckland region since 2001 (Figure 2). Since record collection began, in general there was an increasing chlamydia rate across these regions. However since 2010 rates have decreased in the Waikato and Bay of Plenty/Lakes regions (858 to 784 per 100 000 and 1041 to 984 per 100 000 respectively).

**Figure 2: Chlamydia rates in selected DHBs, 1998-2011**



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

Figure 3: Chlamydia rates by DHB, 2007 to 2011



<sup>1</sup> Waitemata, Auckland and Counties Manukau DHBs

\* Data incomplete

## Age and sex distribution of test-positive cases

### Annual 2011 analysis

Age and sex information was recorded for 98.9% (25 379/25 666) and 99.8% (25 623/25 666) of cases of test-positive chlamydia cases, respectively. The national rate for females (1145 per 100 000 population, 19 010 cases) was almost three-times the national rate for males (412 per 100 000 population, 6613 cases) (Table 2). The highest rate of chlamydia cases in females was reported for Tairāwhiti DHB (2265 per 100 000, 541 cases), followed by Lakes (1971 per 100 000, 1048 cases) and Hawke's Bay (1497 per 100 000, 1191 cases) DHBs. The highest rate of chlamydia cases in males was also reported for Tairāwhiti DHB (705 per 100 000, 160 cases), followed by Lakes (529 per 100 000, 271 cases) and Hawke's Bay (488 per 100 000, 369 cases) DHBs.

The mean age of test-positive chlamydia cases was 22.5 years (median age 21 years, range 0 to 74 years). Seventy-one percent (18 241) of positive cases were aged from 15 to 24 years. The highest national age-specific rate of test-positive chlamydia for males occurred in the 20 to 24 years age group (1973 per 100 000 population, 2427 cases). For females, the highest age-specific rate of test-positive chlamydia cases occurred in the 15 to 19 years age group (6348 per 100 000 population, 7372 cases). The highest DHB age-specific rate was in the 15 to 19 years age group from Tairāwhiti DHB (8652 per 100 000

population, 305 cases). Table 3 presents the number of test-positive chlamydia cases, and chlamydia population rates by DHB and age group for 2011.

One hundred and five test-positive chlamydia cases were reported in the less than 1 year age group. Age-specific rates by DHB could not be calculated separately for this age group, as estimated population data were not available.

### Trends in age and sex distribution of chlamydia

Between 2008 and 2011, there was no change in the overall distribution test-positive chlamydia cases by age and sex. In females, the highest relative rate increase was seen in the 35 to 39 years age group (372 to 446 cases per 100 000 population, 20%). In males, the highest relative rate increase was seen in the 20 to 24 years age group (1792 to 2053 cases per 100 000 population, 15%). In both females and males, the highest absolute rate increases were seen in the 20 to 24 years age group (5288 to 5684 cases per 100 000 population and 1792 to 2053 cases per 100 000 population, respectively). The greatest relative rate decrease was seen in females in the under 15 years and 40 years and over age groups (161 to 147, 8% and 61 to 56 cases per 100 000, 8%, respectively) and in males in the under 15 years age group (33 to 31 cases per 100 000 population, 4%). Chlamydia rates by age group and sex from 2008 to 2011 are presented in Figure 4.

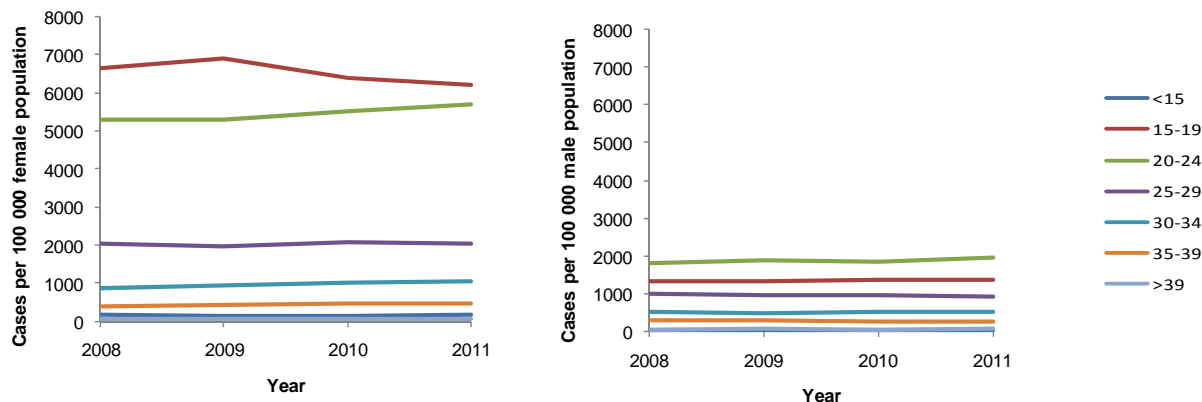
**Table 2: Number of test-positive chlamydia cases and chlamydia rates by DHB and sex, 2011**

District Health Board	Number of test-positive cases				Rate per 100 000 population		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	312	1075	6	1393	401	1340	881
Auckland region <sup>a</sup>	2952	8103	7	11 062	400	1060	736
Waikato	768	2114	1	2883	424	1134	785
Lakes	271	1048	2	1321	529	1971	1265
Bay of Plenty	424	1346	7	1777	411	1241	839
Tairāwhiti	160	541	2	703	705	2265	1510
Taranaki	210	471	1	682	387	849	621
Hawke's Bay	369	1191	0	1560	488	1497	1006
Whanganui	111	368	0	479	368	1170	777
MidCentral	341	838	3	1182	415	969	701
Wairarapa	47	178	0	225	236	862	555
West Coast	48	114	1	163	288	709	498
Southern	600	1623	13	2236	396	1051	731
Other <sup>b</sup>	479	905	0	1384	-	-	-
<b>Total<sup>c</sup></b>	<b>6613</b>	<b>19 010</b>	<b>43</b>	<b>25 666</b>	<b>412</b>	<b>1145</b>	<b>786</b>

a Waitemata, Auckland and Counties Manukau DHBs

b Data from DHBs where selection criteria were not met

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

**Figure 4: Chlamydia rates per 100 000 population by age group and sex, 2008-2011**

Between 2008 and 2011, the female/male ratio of test-positive chlamydia cases decreased from 3.0 to 2.8. During this period there were increases for both females and males (17 442 to 17 923 cases and 5815 to 6295 cases, respectively) in the number of test-positive chlamydia cases. The female/male ratio of test-positive cases and the total number of test-positive chlamydia cases from 2008 to 2011 are presented in Figure 5.

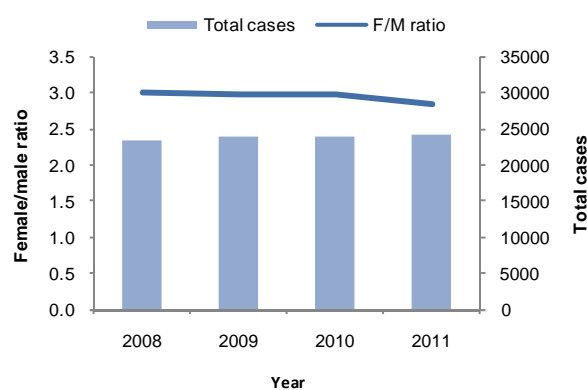
**Figure 5: Female/male ratio of cases and total number of chlamydia cases, 2008-2011**

Table 3: Number of test-positive chlamydia cases and chlamydia rates by DHB and age group, 2011

District Health Board	Age group (years)																					
	0 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 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	-	2	-	39	333	685	6282	448	5129	99	1372	55	764	31	350	31	38	1	-	1393	881
Auckland region <sup>a</sup>	79	71	1	-	169	168	3305	2987	4025	3404	1685	1407	848	797	427	398	521	83	2	-	11 062	736
Waikato	12	43	0	-	37	141	1080	3880	1058	3943	352	1542	179	836	87	388	77	46	1	-	2883	785
Lakes	1	-	0	-	57	730	598	7900	398	5971	147	2479	68	1139	29	442	23	48	0	-	1321	1265
Bay of Plenty	1	-	0	-	58	384	721	5017	616	5155	183	1694	100	917	42	336	45	42	11	-	1777	839
Tairāwhiti	3	-	0	-	23	607	305	8652	217	7368	73	2797	35	1449	23	823	16	77	8	-	703	1510
Taranaki	1	-	0	-	7	93	172	2287	186	2747	56	905	22	364	20	301	12	22	206	-	682	621
Hawke's Bay	6	52	1	-	54	469	666	6038	531	5775	158	1981	69	860	37	392	38	50	0	-	1560	1006
Whanganui	0	-	2	-	8	184	170	3820	157	3910	68	2132	18	637	8	232	3	-	45	-	479	777
MidCentral	3	-	3	-	14	122	436	3270	453	3295	150	1513	73	808	27	275	23	29	0	-	1182	701
Wairarapa	0	-	0	-	7	263	89	3497	88	4171	17	977	14	731	3	-	7	32	0	-	225	555
West Coast	2	-	0	-	0	-	62	2870	56	3120	25	1515	7	403	5	256	5	29	1	-	163	498
Southern	7	36	1	-	11	62	799	3410	920	3508	288	1442	110	610	44	232	44	30	12	-	2236	731
Other <sup>b</sup>	8	-	2	-	12	-	407	-	508	-	205	-	120	-	58	-	60	-	4	-	1384	-
<b>Total<sup>c</sup></b>	<b>117</b>	<b>49</b>	<b>10</b>	<b>5</b>	<b>484</b>	<b>217</b>	<b>9088</b>	<b>3798</b>	<b>9153</b>	<b>3826</b>	<b>3301</b>	<b>1502</b>	<b>1598</b>	<b>792</b>	<b>783</b>	<b>368</b>	<b>845</b>	<b>57</b>	<b>287</b>	<b>-</b>	<b>25 666</b>	<b>786</b>

a Waitemata, Auckland and Counties Manukau DHBs

b Data from DHBs where selection criteria were not met

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

## Test positivity rates

### Annual 2011 analysis

The 35 laboratories from 15 DHBs that met the selection criteria (Appendix B) reported testing 293 456 specimens for chlamydia, of which 9.0% (26 400 specimens) tested positive from 25 666 cases. Nationally, 90 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 2011.

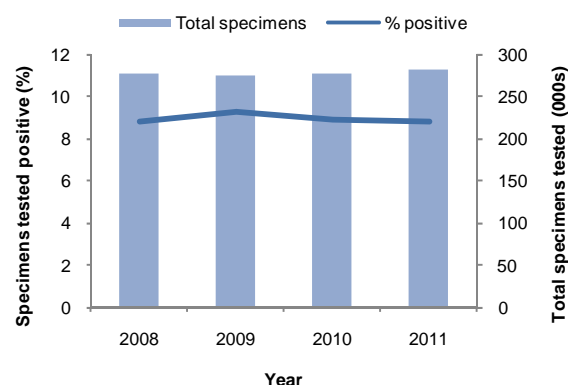
The highest numbers of tests relative to population size were in Lakes and Tairāwhiti DHBs (106 per 1000 population each), followed by the Auckland region (98 per 1000 population) and Southern (94 per 1000 population) DHB.

Of the specimens tested, Tairāwhiti DHB had the highest percentage positive for chlamydia (14.5%), followed by Hawke's Bay DHB (12.3%). The Auckland region and Southern DHB had the lowest percentages of positive tests (7.8% each).

### Trends in test positivity

Twelve DHBs met the criteria (Appendix B) for trend analysis of test positivity rates (Figure 6). Between 2008 and 2011, the percentage of all specimens tested for chlamydia that were positive remained the same (8.8% positive). During this period, there was a small increase in the number of specimens tested for chlamydia each year, from 276 490 specimens in 2008 to 282 140 specimens in 2011 (2% increase).

**Figure 6: Percentage of specimens tested that were positive and total specimens tested for chlamydia, 2008-2011**



**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, 2011**

District Health Board	Total specimens	Tests per 1000 population	Specimens tested positive (%)	Number of laboratory-confirmed cases
Northland	11 981	76	11.6	1 393
Auckland region <sup>a</sup>	146 750	98	7.8	11 062
Waikato	29 637	81	9.8	2 883
Lakes	11 087	106	11.9	1 321
Bay of Plenty	17 664	83	10.2	1 777
Tairāwhiti	4 948	106	14.5	703
Taranaki	9 908	90	8.4	682
Hawke's Bay	12 681	82	12.3	1 560
Whanganui	4 221	69	11.8	479
MidCentral	11 526	68	10.5	1 182
Wairarapa	2 147	53	10.9	225
West Coast	2 085	64	8.0	163
Southern	28 821	94	7.8	2 236
Other <sup>b</sup>	20 445	-	7.1	1 384
<b>Total<sup>c</sup></b>	<b>293 456</b>	<b>90</b>	<b>9.0</b>	<b>25 666</b>

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

### Annual 2011 analysis

The site from which the specimen was taken was recorded for 76.2% (20 898/27 441 specimens) of positive specimens, based on chlamydia data from all 39 laboratories (Figure 7). In females, the most common specimen site was the cervix (49.6%, 10 057/20 286 positive specimens). In males, the most common specimen site was urine (53.0%, 3778/7118 positive specimens). A total of 121 positive specimens were from the eye, of these 80 (66.1%) were from patients aged less than 1 year.

### Trends in specimen site

Figure 8 presents the specimen site of positive chlamydia tests for females and males, expressed as a percentage of the total number of positive specimens,

reported by any participating laboratory between 2007 and 2011. Of note, there has been a decrease in the number of positive tests from urethral specimens in females and males (85%, 1875 to 283 specimens and 28%, 1513 to 1083 specimens, respectively). This decrease is not explained by the increase in unknown specimen sites (analysis not shown). There was also an increase in the number of positive specimens from vaginal swabs (159%, 776 to 2010 specimens) from 2007 to 2011. Between 2010 and 2011, there was a large increase in the number of specimens reported as being from an unknown site in both females and males (138%, 1942 to 4613 specimens and 89%, 1015 to 1921 specimens, respectively). This is due to changes in reporting practices by laboratories in three DHBs.

Figure 7: Specimen site, all positive chlamydia tests by sex, 2011

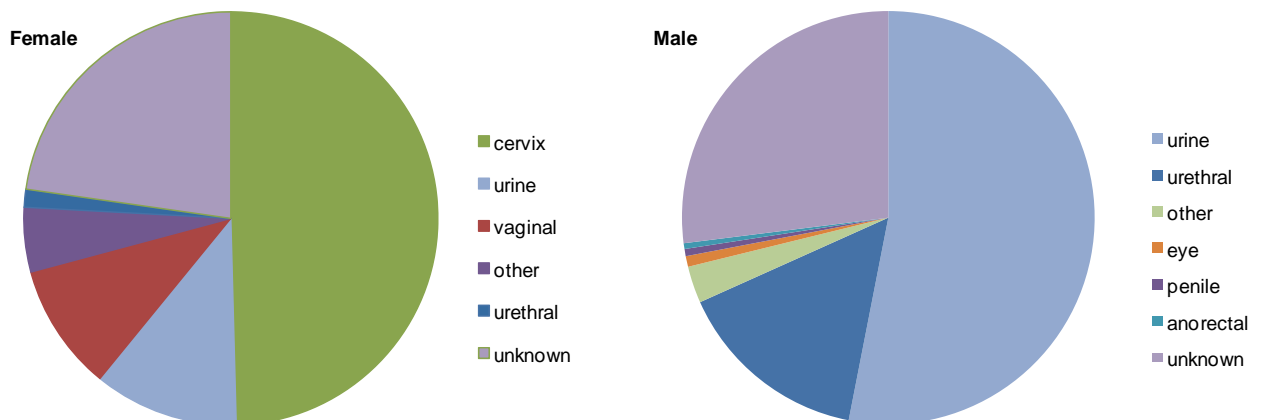
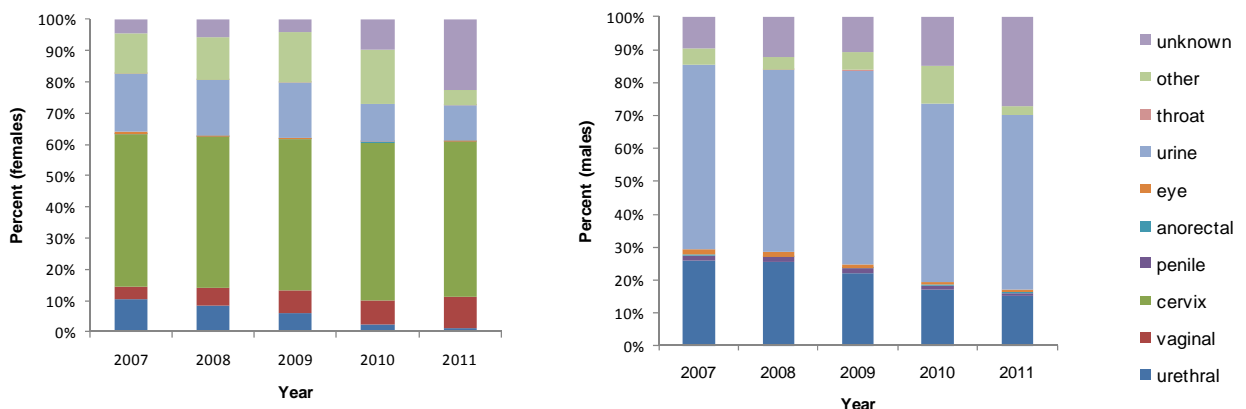


Figure 8: Specimen site, percentage of all positive chlamydia tests by sex, 2007-2011



## Clinic surveillance of chlamydia

### National analysis

#### Annual 2011 analysis

In 2011, the numbers of chlamydia cases reported by SHCs, FPCs and SYHCs were 5343, 2827 and 965 cases, respectively (Table 5).

**Table 5: Chlamydia case numbers by clinic type, 2011**

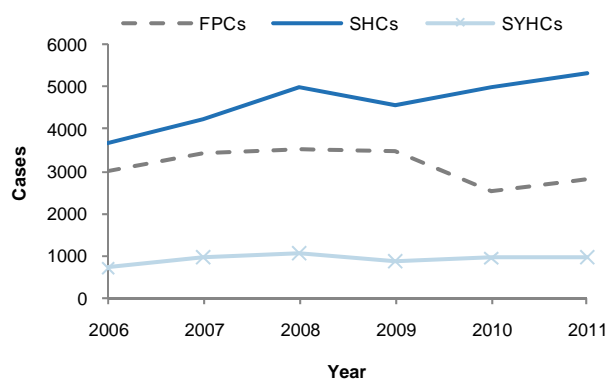
Clinic type	Total number of cases
SHC	5343
FPC	2827
SYHC	965
<b>Total</b>	<b>9135</b>

#### Trends in national totals

Between 2010 and 2011, chlamydia clinic case numbers increased by 7.1% in SHCs (4990 to 5343 cases), 11.6% in FPCs (2534 to 2827 cases) and 1.7% in SYHCs (949 to 965 cases).

From 2006 to 2011, chlamydia case numbers increased by 53.1% in SHCs (from 3489 to 5343) and by 62.2% in SYHCs (from 595 to 965 cases) (Figure 9). In contrast, the number of chlamydia cases decreased by 1.7% in FPCs (from 2875 to 2827 cases) from 2006 to 2011.

**Figure 9: Chlamydia cases numbers by clinic type, 2006 to 2011**



### DHB counts

#### Annual 2011 analysis

Clinics in 19 DHBs contributed to chlamydia surveillance in 2011. The numbers of chlamydia cases in each clinic type by DHB are presented in Table 6. The highest case numbers of chlamydia in SHCs were seen in Auckland region (1507 cases) and Bay of Plenty (748 cases) DHBs.

**Table 6: Chlamydia case numbers by clinic type and DHB, 2011**

District Health Board	Clinic type			Total
	SHC	FPC	SYHC	
Northland	404	175	82	661
Auckland region <sup>a</sup>	1507	627	66	2200
Waikato	633	495	65	1193
Lakes	226	-	-	226
Bay of Plenty	748	138	-	886
Tairāwhiti	216	174	-	390
Taranaki	241	38	-	279
Hawke's Bay	268	-	174	442
Whanganui	43	25	49	117
MidCentral	163	-	22	185
Wellington region <sup>b</sup>	252	373	328	953
Nelson Marlborough	99	275	-	374
West Coast	41	43	-	84
Canterbury	217	231	64	512
South Canterbury	28	46	-	74
Southern	257	187	115	559

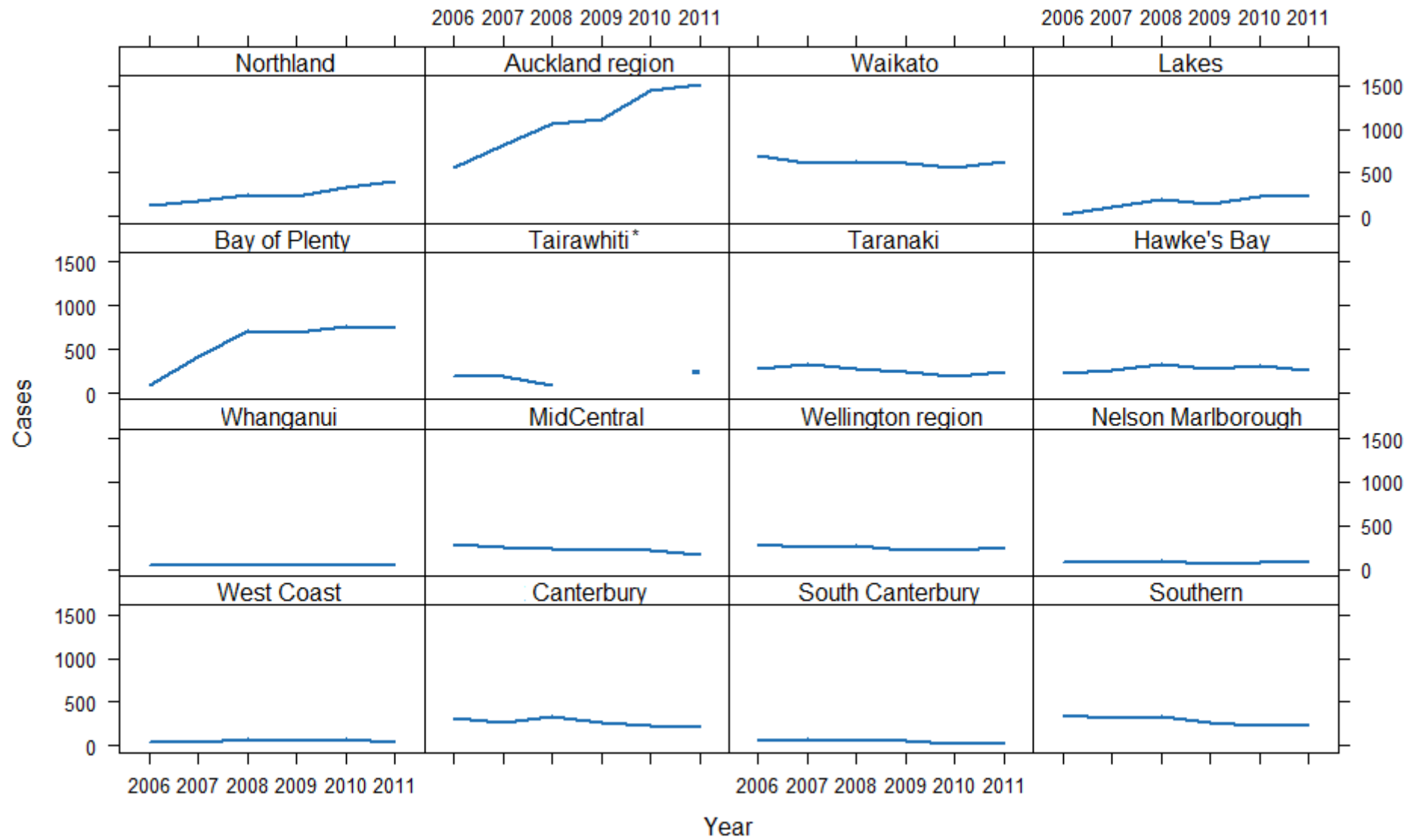
<sup>a</sup> Waitemata, Auckland and Counties Manukau DHBs

<sup>b</sup> Hutt Valley and Capital and Coast DHBs

#### Trends in DHB counts

Chlamydia case numbers in SHCs from 2006 to 2011 are presented by DHB in Figure 10. There is variation in the trends seen among DHBs. For example, there are increasing case numbers over the six-year period in Northland DHB and Auckland region, while decreasing case number were seen in Canterbury and Southern DHBs.

Figure 10: Chlamydia case numbers in SHCs by DHB, 2006-2011



\* data was not available for Tairawhiti DHB for 2009-2010

## Sex, age and ethnicity distribution of chlamydia cases

### 2011 analysis

Sex was recorded for all chlamydia cases in 2011. More cases of chlamydia were seen in females than males across all clinic types. Table 7 presents the number of cases of chlamydia by sex and clinic type for 2011.

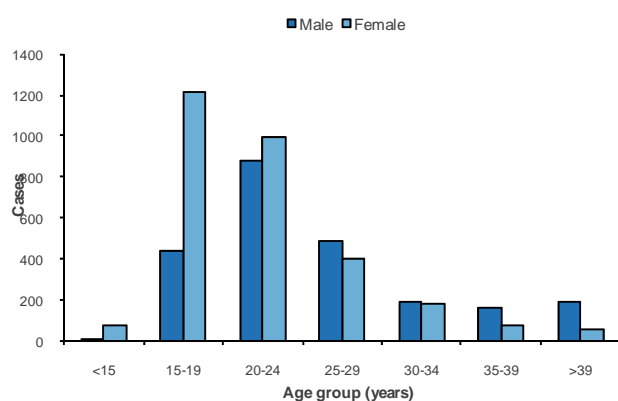
**Table 7: Number of cases of chlamydia by sex and clinic type, 2011**

Clinic type	Number of cases		
	Male	Female	Total
SHC	2359	2984	5343
FPC	377	2450	2827
SYHC	244	721	965
<b>Total</b>	<b>2980</b>	<b>6155</b>	<b>9135</b>

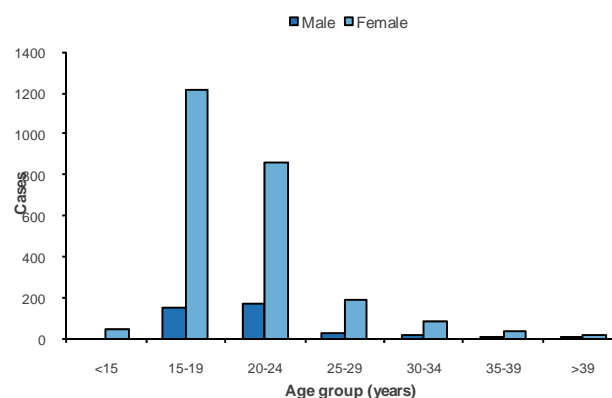
Age was recorded for all except 10 of the chlamydia cases in 2011. A large proportion of the reported cases of chlamydia were aged less than 25 years - 67.5% (3608/5343) in SHCs, 86.6% (2447/2826) in FPCs and 92.6% (885/956) in SYHCs. The mean age of chlamydia cases was 23.6 years in SHCs, 20.5 years in FPCs and 20.0 years in SYHCs.

The number of males with chlamydia was highest in the 20 to 24 years age group across all clinic types - 879 cases (37.2%) in SHCs, 172 cases (45.6%) in FPCs and 130 cases (53.3%) in SYHCs). For females, chlamydia case numbers were highest in the 15 to 19 years age group (1215 cases each in SHCs and FPCs, (40.7% and 49.6%, respectively) and 340 cases (47.2%) in SYHCs). Figure 11 and Figure 12 present the clinic visit counts by age group and sex reported by SHCs and FPCs in 2011.

**Figure 11: Confirmed chlamydia cases reported by SHCs by age group and sex, 2011**



**Figure 12: Confirmed chlamydia cases reported by FPCs by age group and sex, 2011**



Note: The male to female ratio of attendees in FPCs is 1:23

Ethnicity was recorded by SHCs for 98.6% (5268/5343) of the reported chlamydia cases (Table 8). The highest percentage of chlamydia cases reported by SHCs were of European ethnicity (43.8%, 2305 cases), followed by Māori (40.1%, 2115 cases), Pacific Peoples (11.0%, 580 cases) and Other (5.1%, 268 cases) ethnicity. Ethnicity was recorded by FPCs for 96.4% (2724/2827) of the reported chlamydia cases. The highest percentage of chlamydia cases reported by FPCs were of European ethnicity (50.9%, 1387 cases), followed by Māori (35.6%, 971 cases), Pacific Peoples (9.9%, 271 cases) and Other (3.5%, 95 cases) ethnicity. Ethnicity was recorded by SYHCs for 98.4% (950/965) of the reported chlamydia cases. The highest percentage of cases reported by SYHCs were of European ethnicity (50.5%, 480 cases), followed by Māori (37.8%, 359 cases), Other (6.5%, 62 cases) and Pacific Peoples (5.2%, 49 cases) ethnicity.

**Table 8: Confirmed chlamydia cases by ethnicity and clinic setting, 2011**

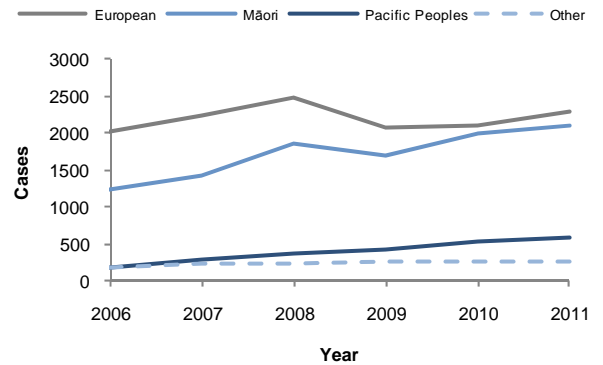
Ethnicity	Clinic type		
	SHC	FPC	SYHC
European	2305	1387	480
Māori	2115	971	359
Pacific Peoples	580	271	49
Other	268	95	62
Unknown	75	103	15
<b>Total</b>	<b>5343</b>	<b>2827</b>	<b>965</b>

### Trends in sex, age and ethnicity

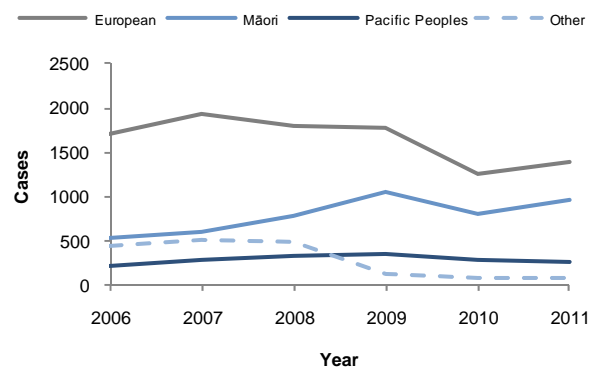
Between 2006 and 2011, the number of confirmed chlamydia cases has increased in every age group in SHCs in both females and males (Figure 15). Notably, chlamydia diagnoses at SHCs have remained highest in females in the 15 to 19 years age group over the six-year period (925 cases in 2006 to 1215 cases in 2011) compared with other age groups. A different trend is seen in FPCs (Figure 16). The number of chlamydia diagnoses made in males in FPCs decreased in all age groups between 2006 and 2011. In females, the number of confirmed cases in the 15 to 19 and 20 to 24 years age groups decreased, after peaking at 1617 cases (in 2008) and 1361 cases (in 2009), respectively.

In SHCs, there was an increase in the numbers of people diagnosed with chlamydia in all ethnic groups between 2006 and 2011 (Figure 13). The largest relative increase was seen in the Pacific Peoples (175 to 580 cases, 231%), followed by the Māori (1228 to 2115 cases, 72%) ethnic groups. In FPCs, there was an increase in chlamydia case numbers seen in the Māori (536 to 971 cases, 81%) and Pacific Peoples (233 to 271 cases, 16%) ethnic groups, and a decrease in chlamydia case numbers seen in the European (1709 to 1387, 19%) and Other (437 to 95, 78%) ethnic groups (Figure 14).

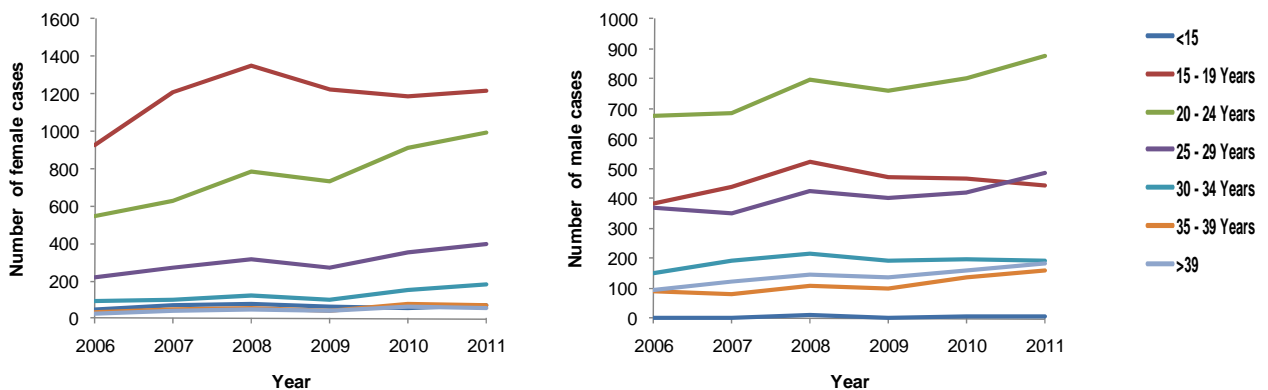
**Figure 13: Chlamydia case numbers reported from SHCs by ethnicity, 2006-2011**



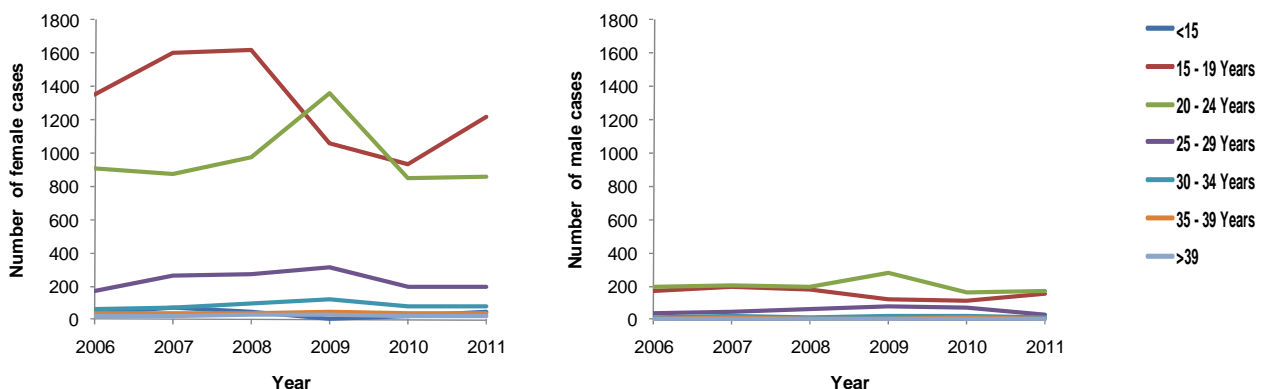
**Figure 14: Chlamydia case numbers reported from FPCs by ethnicity, 2006-2011**



**Figure 15: Chlamydia case numbers in SHCs by sex and age group, 2006-2011**



**Figure 16: Chlamydia case numbers in FPCs by sex and age group, 2006-2011**



## Site of infection

### Annual 2011 analysis

In 2011, chlamydia cases were most commonly confirmed from a urogenital site in all clinic types, as follows: 93.6% of SHC cases (5001 cases), 97.9% of FPC cases (2768) and 97.9% of SYHC cases (945).

Table 9 presents the number of confirmed chlamydia cases by site of infection and clinic setting for 2011.

**Table 9: Chlamydia case numbers by site of infection and clinic setting, 2011**

Site	Clinic type		
	SHC	FPC	SYHC
Urogenital	5001	2768	945
PID/epididymitis	276	57	8
Other site	105	4	13
<b>Total</b>	<b>5343</b>	<b>2827</b>	<b>965</b>

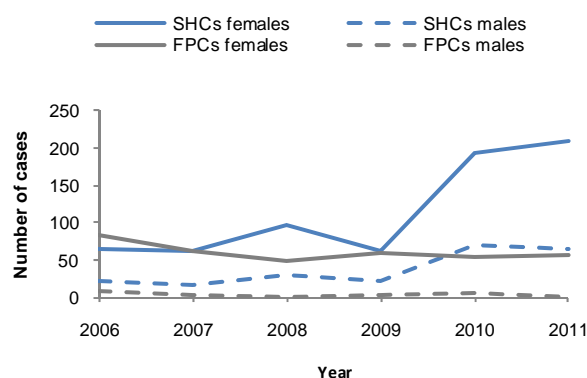
Complicated infections (epididymitis in males and PID in females) were reported for 5.2% (276/5323) of chlamydia cases in SHCs, 2.0% (57/2827) of cases in FPCs and 0.8% (8/965) of cases in SYHCs. A total of 67 males (66 in SHCs and 1 in an SYHC) were reported with epididymitis, 44.8% (30 cases) of whom were aged less than 25 years. Of the 64 male chlamydia cases (95.5%) where ethnicity was recorded, the highest percentage of cases were of European ethnicity (54.7%, 35 cases), followed by Māori (23.4%, 15 cases), Pacific Peoples (18.8%, 12 cases) and Other (3.1%, 2 cases) ethnicity. A total of 274 females (210 in SHCs, 57 in

FPCs and 7 in SYHCs) were reported with PID, 67.5% (185 cases) of whom were aged less than 25 years. Of the 270 cases (98.5%) where ethnicity was recorded, the highest percentage of cases were of Māori ethnicity (47.0%, 127 cases), followed by European (37.4%, 101 cases), Pacific Peoples (11.9%, 32 cases) and Other (3.7%, 10 cases) ethnicity.

### Trends in site of infection

Figure 17 presents the number of epididymitis cases in males and PID cases in females reported by SHCs and FPCs from 2006 to 2011. Notably, the numbers of complicated infections seen in SHCs have increased in both females and males (64 to 210 cases and 22 to 66 cases, respectively); while there has been little change in cases seen in FPCs.

**Figure 17: Numbers of epididymitis cases in males and PID cases in females by clinic type, 2006-2011**



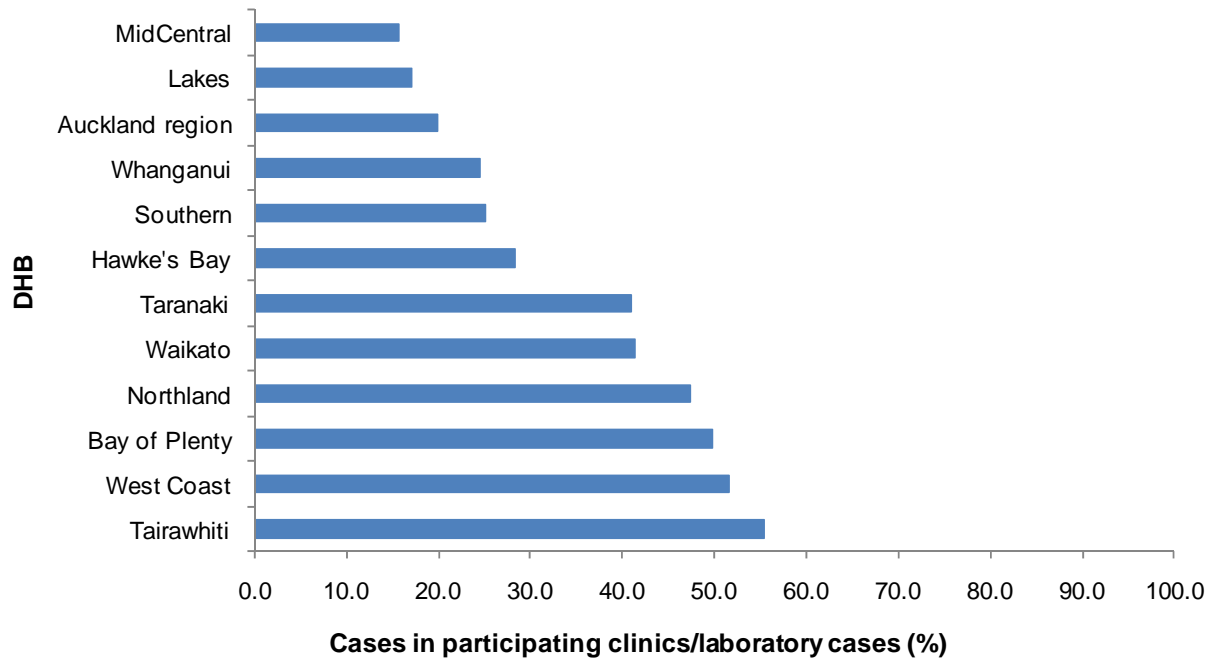
## Comparison of laboratory and clinic surveillance

For DHBs that meet the selection criteria for chlamydia laboratory reporting and that have clinics which participate in the STI surveillance programme, clinic Figure 18. Chlamydia cases not seen in the participating clinics are likely to be diagnosed predominantly in primary care. The highest proportion of chlamydia cases seen in a participating clinic was in Tairāwhiti

cases as a proportion of laboratory cases are presented in

(55.5%), followed by West Coast (51.5%) and Bay of Plenty (49.9%) DHBs. The lowest proportions of chlamydia cases seen in a participating clinic were in MidCentral (15.7 %) and Lakes (17.1 %) DHBs.

**Figure 18: Cases of chlamydia seen in participating clinics as a proportion (%) of all positive laboratory tests, by DHB, 2011**







# GONORRHOEA



# GONORRHOEA

## Key findings

- In 2011, the estimated national gonorrhoea rate was 67 cases per 100 000 population.
- The highest gonorrhoea rate was seen in Tairāwhiti DHB, 356 cases per 100 000 population, over 5-times the estimated national rate.
- *N. gonorrhoeae* isolates with reduced susceptibility to ceftriaxone were identified in the Auckland region in 2010.

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

#### Annual 2011 analysis

In 2011, 39 laboratories provided gonorrhoea data. Of these, 35 laboratories from 17 DHBs met the selection criteria for gonorrhoea reporting (Appendix B). Laboratories in these DHBs reported positive tests from 2466 patients. The estimated national gonorrhoea rate, based on 17 DHBs, was 67 per 100 000 population (95% CI [61,72]).

Seventeen DHBs met the selection criteria for individual analysis in 2011 (Appendix B). The highest numbers of test-positive gonorrhoea cases were seen in the Auckland region (1117 cases) and Waikato DHB (208 cases). There was wide variation in the population rates by DHB from 356 per 100 000 population in Tairāwhiti DHB to 27 per 100 000 population in West Coast DHB (Table 10).

**Table 10: Number of gonorrhoea test-positive cases and population rates by DHB, 2011**

District Health Board	Number of test-positive cases	Rate per 100 000 population
Northland	84	53
Auckland region <sup>a</sup>	1117	74
Waikato	208	57
Lakes	75	72
Bay of Plenty	127	60
Tairāwhiti	166	356
Taranaki	75	68
Hawke's Bay	140	90
Whanganui	44	71
MidCentral	111	66
Wellington region <sup>b</sup>	177	40
Wairarapa	25	62
West Coast	9	27
Southern	108	35
Other <sup>c</sup>	84	-
<b>Total<sup>d</sup></b>	<b>2466</b>	<b>67</b>

a Waitemata, Auckland and Counties Manukau DHBs

b Hutt Valley and Capital and Coast DHBs

c Data from DHBs where selection criteria were not met

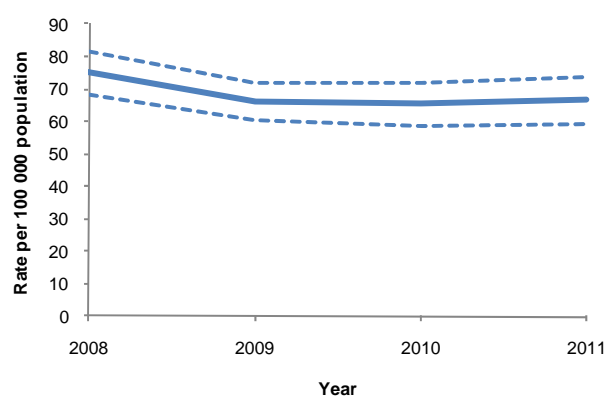
d Total and rate calculations include only cases and population for DHBs meeting the selection criteria

### Trends in laboratory diagnoses

#### 1. National rate trend analysis

Fifteen DHBs met the selection criteria for the national estimated rate trend analysis for gonorrhoea (Appendix B). Between 2010 and 2011, the estimated national gonorrhoea rate increased slightly (from 65 to 67 per 100 000 population). From 2008 to 2011, the estimated national gonorrhoea rate decreased by 11.3% (from 75.1 to 66.6 per 100 000 population). The estimated national gonorrhoea rates from 2008 to 2011, with a 95% confidence interval indicated, are shown in Figure 19.

**Figure 19: Estimated national gonorrhoea rate, 2008 to 2011**

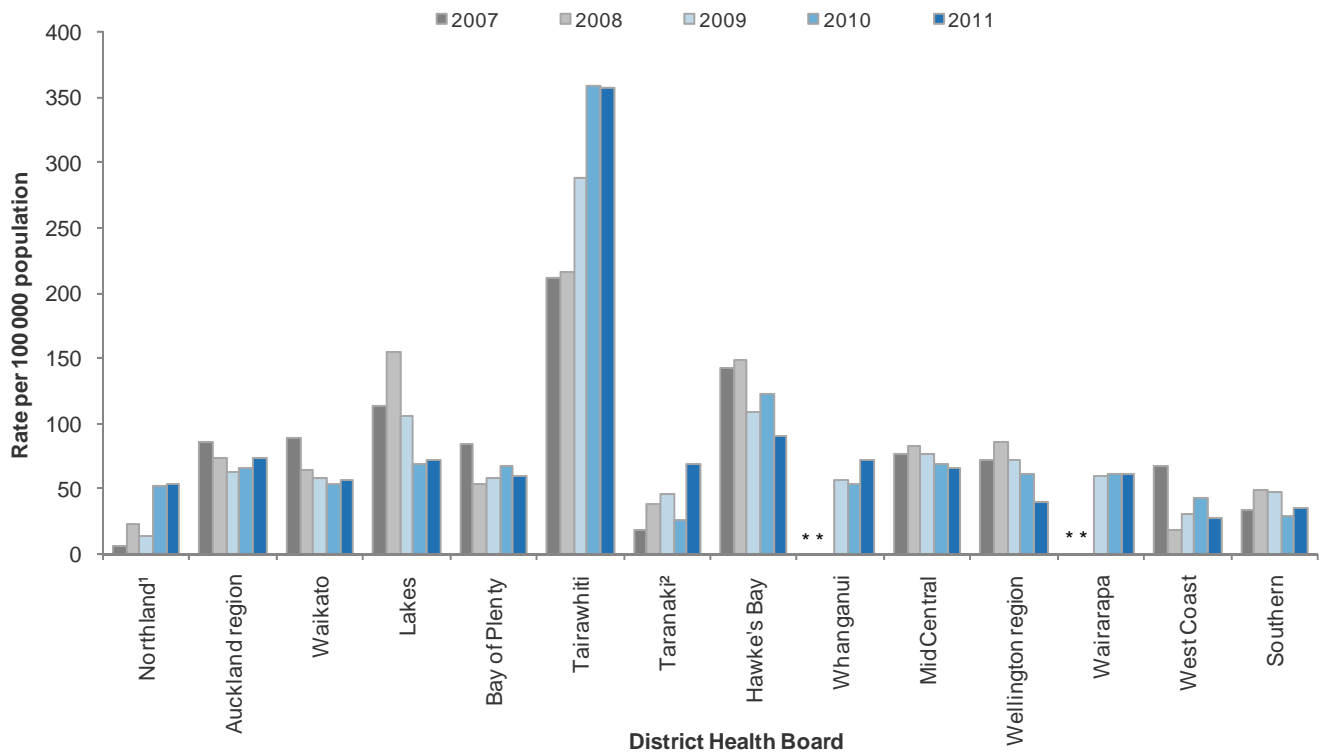


#### 2. Individual DHB trend analysis

Seventeen DHBs met the selection criteria for the individual DHB trend analysis (Appendix B). From 2007 to 2011, the gonorrhoea rate varied among DHBs and across years (Figure 20). The most notable trend is the continued high gonorrhoea rate in Tairāwhiti DHB. Other notable trends over this period are that the:

- i. rates in Northland and Taranaki DHBs are increasing, associated with the addition of reporting by hospital laboratories in these DHBs
- ii. rates in Hawke's Bay DHB and the Wellington region are decreasing
- iii. the rate in Southern DHB remains low.

Figure 20: Gonorrhoea rates by DHB, 2007 to 2011



\* Data incomplete

<sup>1</sup> The 2009-2010 rate increase was associated with the addition of reporting from the Whangarei Hospital laboratory

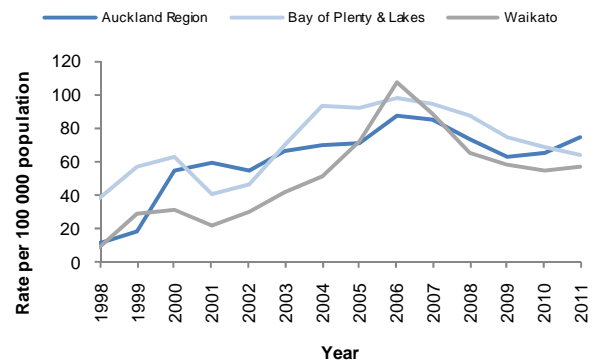
<sup>2</sup> The 2010-2011 rate increase was associated with the addition of reporting from the Taranaki Base Hospital laboratory

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

### 3. Three regions analysis

Laboratory data has been collected from laboratories in the Auckland region, Waikato, Lakes and Bay of Plenty DHBs since 1998. The three areas show the same long term trend, with a steady increase in gonorrhoea rates from 1998 to 2006 and a decline from 2007 to 2010. However, 2011 shows an increase in gonorrhoea rates in the Auckland region and Waikato DHB. Figure 21 presents gonorrhoea rates in these three areas from 1998 to 2011.

Figure 21: Gonorrhoea rates in selected DHBs, 1998-2011



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

## Age and sex distribution of test-positive cases

### Annual 2011 analysis

Age and sex information was recorded for 98.6% (2432/2466) and 99.7% (2459/2466) of the test-positive gonorrhoea cases, respectively. The national rate for males (79 per 100 000 population, 1429 cases) was 1.4-times the national rate for females (55 per 100 000 population, 1030 cases) (Table 11). The highest rate of gonorrhoea in females was reported for Tairāwhiti DHB (352 per 100 000, 84 cases), followed by Hawke's Bay (94 per 100 000, 75 cases) and Taranaki (77 per 100 000, 43 cases) DHBs. The highest rate of chlamydia cases in males was also reported for Tairāwhiti DHB (361 per 100 000, 82 cases), followed by Whanganui DHB (96 per 100 000, 29 cases) and Auckland region (95 per 100 000, 698 cases).

The mean age of test-positive gonorrhoea cases was 24.7 years (median age 22 years, range 0 to 66 years). Sixty-two percent (1504/2432) of positive cases were aged from 15 to 24 years. The highest national age-specific rate of test-positive gonorrhoea occurred in the 20 to 24 years age group for males (327 per 100 000 population, 462 cases), nearly five-times the national rate. For females, the highest age-specific rate of test-positive gonorrhoea cases occurred in the 20 to 24 years age group (284 per 100 000 population, 382 cases), over four-times the national rate. The highest DHB age-specific rate was in the 15 to 19 years age group from Tairāwhiti DHB (2071 per 100 000 population, 73 cases). Table 12 presents the number of test-positive gonorrhoea cases and gonorrhoea rates by DHB and age group for 2011. Two cases of gonorrhoea were reported for the less than 1 year age group.

**Table 11: Number of test-positive gonorrhoea cases and gonorrhoea rates by DHB and sex, 2011**

District Health Board	Number of test-positive cases				Rate per 100 000 population		
	Male	Female	Unknown	Total	Male	Female	Total
Northland	43	41	0	84	55	51	53
Auckland region <sup>a</sup>	698	417	2	1117	95	55	74
Waikato	128	80	0	208	71	43	57
Lakes	42	33	0	75	82	62	72
Bay of Plenty	83	44	0	127	80	41	60
Tairāwhiti	82	84	0	166	361	352	356
Taranaki	31	43	1	75	57	77	68
Hawke's Bay	65	75	0	140	86	94	90
Whanganui	29	15	0	44	96	48	71
MidCentral	59	51	1	111	72	59	66
Wellington region <sup>b</sup>	110	67	0	177	51	30	40
Wairarapa	11	14	0	25	55	68	62
West Coast	4	5	0	9	24	31	27
Southern	44	61	3	108	29	39	35
Other <sup>c</sup>	39	43	2	84	-	-	-
<b>Total<sup>d</sup></b>	<b>1429</b>	<b>1030</b>	<b>7</b>	<b>2466</b>	<b>79</b>	<b>55</b>	<b>67</b>

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

Table 12: Number of test-positive gonorrhoea cases and gonorrhoea rates by DHB and age group, 2011

District Health Board	Age Group (years)																					
	0 to 4		5 to 9		10 to 14		15 to 19		20 to 24		25 to 29		30 to 34		35 to 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	1	-	0	-	1	-	34	312	30	343	9	125	3	-	3	-	3	-	0	-	84	53
Auckland region <sup>a</sup>	10	9	1	-	14	14	231	209	392	332	167	139	115	108	68	63	117	19	2	-	1117	74
Waikato	0	-	0	-	3	-	63	226	55	205	42	184	16	75	5	22	10	6	14	-	208	57
Lakes	0	-	0	-	2	-	28	370	26	390	8	135	4	-	3	-	2	-	2	-	75	72
Bay of Plenty	0	-	0	-	0	0	35	244	50	418	15	139	11	101	7	56	9	8	0	-	127	60
Tairāwhiti	0	-	0	-	8	211	73	2071	49	1664	19	728	8	331	6	215	2	-	1	-	166	356
Taranaki	0	-	0	-	0	-	26	346	31	458	9	145	3	-	3	-	2	-	1	-	75	68
Hawke's Bay	0	-	0	-	0	-	48	435	51	555	20	251	9	112	6	64	6	8	0	-	140	90
Whanganui	0	-	0	-	0	0	7	157	14	349	4	-	4	-	3	-	2	-	10	-	44	71
MidCentral	0	-	0	-	2	-	36	270	44	320	18	182	7	77	3	-	1	-	0	-	111	66
Wellington region <sup>b</sup>	0	-	0	-	0	-	36	118	50	137	32	95	30	97	17	53	12	6	0	-	177	40
Wairarapa	0	-	0	-	1	-	8	314	9	427	3	-	1	-	1	-	1	-	1	-	25	62
West Coast	0	-	0	-	0	-	1	46	5	279	1	-	0	0	2	-	0	-	0	-	9	27
Southern	0	-	0	-	2	-	33	141	39	149	14	70	7	39	1	-	9	6	3	-	108	35
Other <sup>c</sup>	0	-	0	-	0	-	23	-	31	-	10	-	10	-	1	-	9	-	0	-	84	-
<b>Total<sup>d</sup></b>	<b>11</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>33</b>	<b>13</b>	<b>659</b>	<b>244</b>	<b>845</b>	<b>306</b>	<b>361</b>	<b>142</b>	<b>218</b>	<b>94</b>	<b>128</b>	<b>52</b>	<b>176</b>	<b>11</b>	<b>34</b>	<b>-</b>	<b>2466</b>	<b>67</b>

a Waitemata, Auckland and Counties Manukau DHBs

b Hutt Valley and Capital and Coast DHBs

c Data from DHBs where selection criteria were not met

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

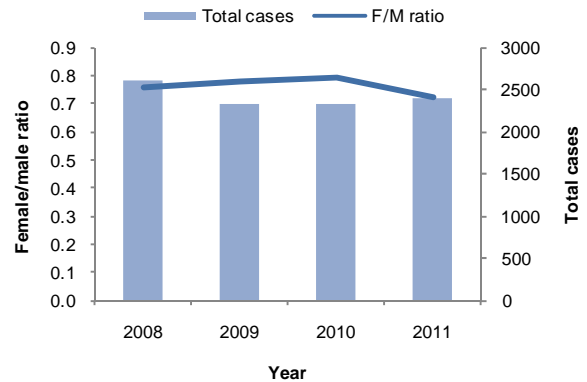
### Trends in age and sex distribution of gonorrhoea

Between 2008 and 2011, the general distribution of test-positive cases of gonorrhoea by age in males remained unchanged. In females the 20 to 24 years age group has become the group with the highest gonorrhoea rate as a result of an increase in test-positive cases in that age group (272 to 291 cases per 100 000 population, 7%) and a decrease in test-positive cases in the 15 to 19 years age group (374 to 266 cases per 100 000 population, 29%). In females, the highest relative rate increase in test-positive cases was seen in the 35 to 40 years age group (19 to 27 cases per 100 000, 46%). In males, the highest relative rate increase in test-positive cases was seen in the 30 to 34 years age group (118 to 148 cases per 100 000, 25%). The greatest relative rate decrease in test-positive cases was seen in males in the 15 to 19 years age group (315 to 237 cases per 100 000, 25%). Gonorrhoea rates per 100 000 population by age group and sex from 2008 to 2011 are presented in Figure 23.

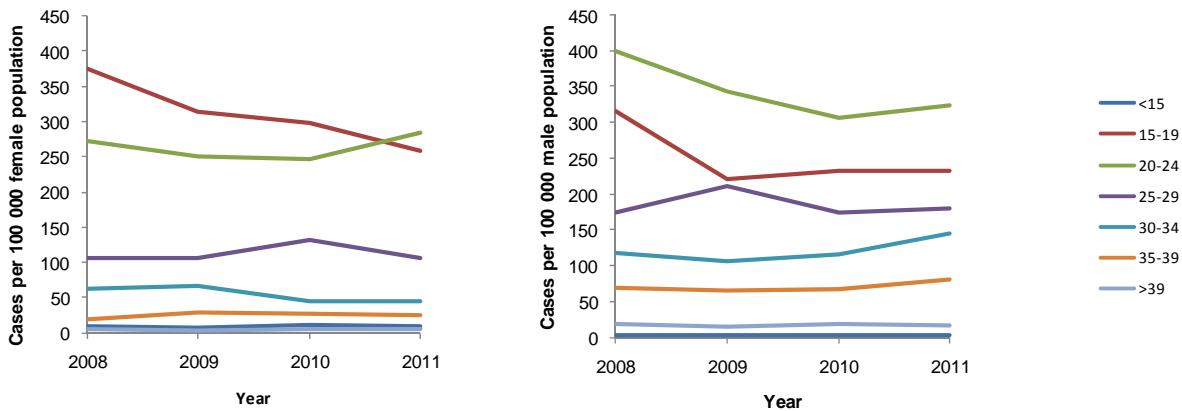
Between 2008 and 2011 the female/male ratio of test-positive gonorrhoea case decreased from 0.76 to

0.72, with a peak of 0.80 in 2010. During this period there was a decrease in the number of test-positive gonorrhoea cases in both females and males (1124 to 1001 cases and 1477 to 1389 cases, respectively). The female/male ratio of test-positive cases and the total number of test-positive gonorrhoea cases from 2008 to 2011 are presented in Figure 22.

**Figure 22: Female/male ratio of cases and total number of gonorrhoea cases, 2008-2011**



**Figure 23: Gonorrhoea rates per 100 000 population by sex and age group, 2008-2011**





## Test positivity rates

### Annual 2011 analysis

The 35 laboratories that met the selection criteria (Appendix B) for gonorrhoea reporting tested 369 904 specimens for gonorrhoea, of which 0.8% (2996 specimens) tested positive from 2466 patients. The national gonorrhoea rate, based on 17 DHBs, was 67 per 100 000 population (2466 cases).

Table 13 presents the percentage of specimens tested for gonorrhoea that were positive, the number of test-

positive gonorrhoea cases and the gonorrhoea population rates, by DHB for 2011.

The highest number of tests relative to population size was the Auckland region (147 per 1000 population), followed by Northland (110 per 1000 population) and Tairāwhiti (95 per 1000 population) DHBs. Variations among DHBs may be due to differences in the testing methods used. Of the specimens tested, Tairāwhiti DHB had the highest percentage of positive specimens (4.0%), followed by Hawke's Bay DHB (2.3%).

**Table 13: 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, 2011**

District Health Board	Total Specimens	Tests per 1000 population	Specimens tested positive (%)	Number of laboratory-confirmed cases
Northland	17 344	110	0.5	84
Auckland region <sup>a</sup>	220 995	147	0.7	1117
Waikato	26 309	72	0.8	208
Lakes	7596	73	1.0	75
Bay of Plenty	12 729	60	1.0	127
Tairāwhiti	4437	95	4.0	166
Taranaki	10 348	94	0.9	75
Hawke's Bay	6640	43	2.3	140
Whanganui	2668	43	1.7	44
MidCentral	10 165	60	1.1	111
Wellington region <sup>b</sup>	29 037	66	0.7	177
Wairarapa	1716	42	1.5	25
West Coast	2646	81	0.3	9
Southern	17 274	57	0.6	108
Other <sup>c</sup>	17 839	-	0.5	84
<b>Total<sup>d</sup></b>	<b>369 904</b>	<b>100</b>	<b>0.8</b>	<b>2466</b>

a Waitemata, Auckland and Counties Manukau DHBs

b Hutt Valley and Capital and 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

### 2011 analysis

Of positive specimens from all 39 laboratories reporting on gonorrhoea to ESR, the site from which the specimen was taken was recorded for 72.4% (1972/2723) of specimens (Figure 24). In females, the most common specimen site was the cervix (28.3%, 379/1341 positive specimens). In males, the most common specimen site was the urethra (49.5%, 732/1479 positive specimens).

### Trends in site of infection

Figure 25 presents the specimen site of positive gonorrhoea tests, expressed as a percentage of total positive specimens, reported by any participating laboratory between 2007 and 2011 for females and males. Of note, there has been a decrease in the number of positive tests from urethral specimens in males (1082 to 732 specimens). There has also been an increase in the number of positive specimens from urinary specimens in males (24 to 106 specimens). These changes are not explained by the increase in unknown specimen sites (analysis not shown). Between 2010 and 2011, there was an increase in the number of specimens reported as being from an unknown site in males (22%, 359 to 437 specimens). This is due to changes in reporting practices by laboratories in three DHBs.

Figure 24: Specimen site, all positive gonorrhoea tests by sex, 2011

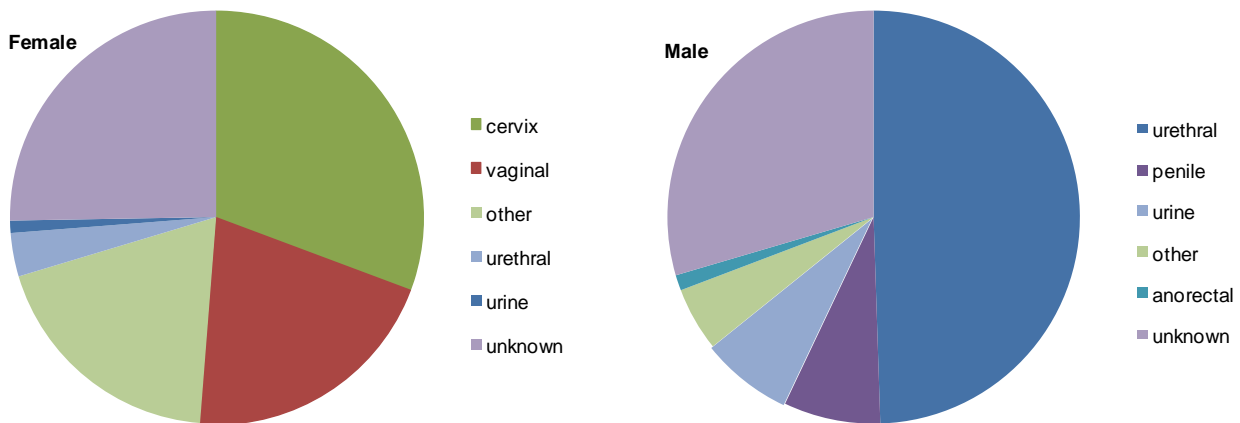
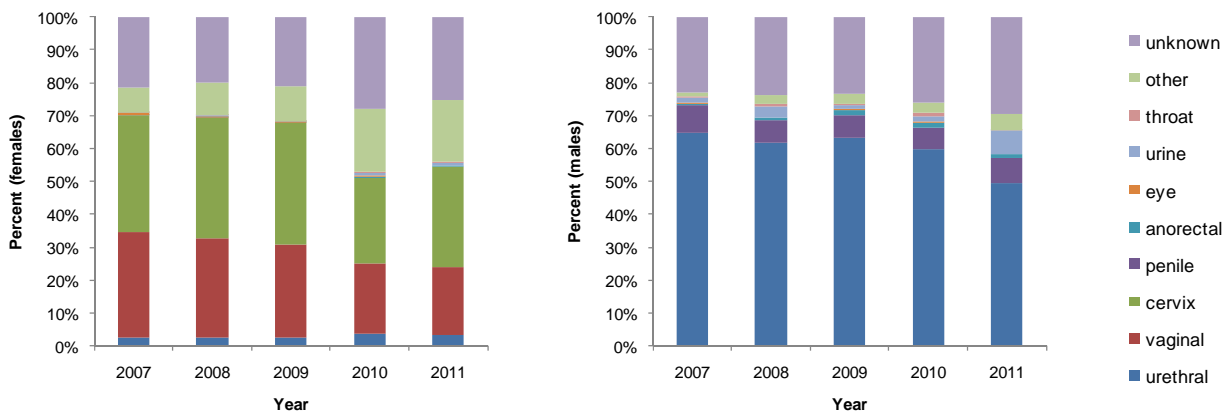


Figure 25: Specimen site, percentage of all positive gonorrhoea tests by sex, 2007-2011



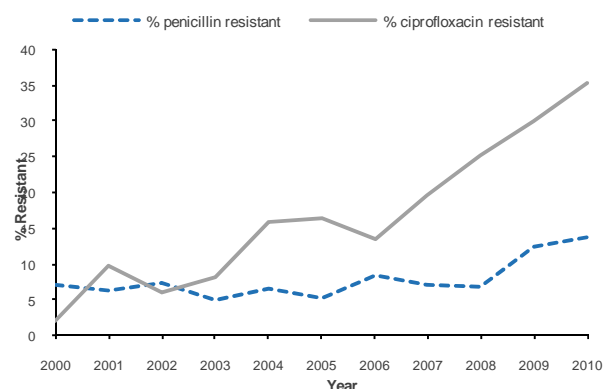
## Antibiotic resistance surveillance

The latest antibiotic resistance surveillance data available from diagnostic laboratories are from 2010. In that year, the prevalence of resistance to penicillin and ciprofloxacin among *N. gonorrhoeae* isolates was 13.7% and 35.4%, respectively. This is an increase compared with 2009, when resistance to penicillin and ciprofloxacin was 12.4% and 29.9%, respectively. Penicillin resistance ranged from 23.6% in Hawke's Bay DHBs (199 isolates tested) to 2.9% in MidCentral/Whanganui (70 isolates tested). Ciprofloxacin resistance ranged from 53.9% in Northland DHB (52 isolates tested) to 11.9% in Southern DHB (84 isolates tested). Data were not available for Nelson Marlborough and West Coast DHBs (Table 14). The prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates from 2000 to 2010 is illustrated in Figure 26.

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 26: Prevalence of penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates, 2000-2010**



**Table 14: Penicillin and ciprofloxacin resistance among *N. gonorrhoeae* isolates by DHB, 2010**

District Health Board <sup>1</sup>	Penicillin		Ciprofloxacin	
	Number tested	% resistant	Number tested	% resistant
Northland	52	3.8	52	53.9
Auckland region <sup>2</sup>	280	23.2	930	31.4
Waikato	187	8.0	190	31.6
Lakes	39	10.3	51	27.5
Bay of Plenty	129	4.7	144	44.4
Tairāwhiti	-	-	167	40.7
Taranaki	-	-	26	46.2
Hawke's Bay	199	23.6	199	50.8
MidCentral/Whanganui	70	2.9	70	42.9
Wairarapa	26	15.4	-	-
Wellington region <sup>3</sup>	-	-	27	37.0
Canterbury region <sup>4</sup>	87	8.0	139	33.8
Southern	84	7.1	84	11.9
<b>Total<sup>1</sup></b>	<b>1153</b>	<b>13.7</b>	<b>2079</b>	<b>35.4</b>

<sup>1</sup> No data available for Nelson Marlborough or West Coast DHBs

<sup>2</sup> Waitemata, Auckland and Counties Manukau DHBs

<sup>3</sup> Hutt Valley and Capital and Coast DHBs

<sup>4</sup> Canterbury and South Canterbury DHBs

## Clinic surveillance of gonorrhoea

### National analysis

#### 2011 analysis

In 2011, the gonorrhoea case numbers reported by SHCs, FPCs and SYHCs were 767, 152, and 36 cases, respectively (Table 15).

**Table 15: Gonorrhoea case numbers by clinic type, 2011**

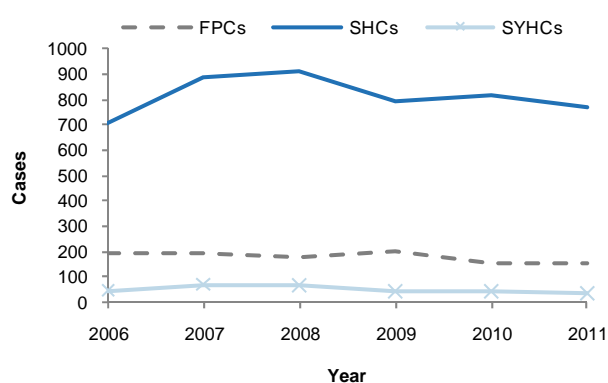
Clinic type	Total Number of cases
SHC	767
FPC	152
SYHC	36
<b>Total</b>	<b>955</b>

#### Trends in national totals

Between 2010 and 2011, gonorrhoea case numbers decreased by 6.2% in SHCs (from 818 to 767), 1.9% in FPCs (155 to 152 cases) and 20.0% in SYHCs (from 45 to 36).

From 2006 to 2011, gonorrhoea case numbers increased by 14.0% in SHCs (from 673 to 767) and by 12.5% in SYHCs (from 32 to 36). In contrast, the number of gonorrhoea cases decreased by 16.5% in FPCs (from 182 to 152) from 2006 to 2011.

**Figure 27: Gonorrhoea case numbers by clinic type, 2006 to 2011**



### DHB counts

#### Annual 2011 analysis

Clinics in 19 DHBs contributed to gonorrhoea surveillance in 2011. Gonorrhoea case numbers in each

DHB by clinic type are presented in Table 16. The highest case numbers of gonorrhoea in SHCs were seen in the Auckland region (318 cases) and Waikato DHB (81 cases). In DHBs with both SHCs and FPCs, higher case counts were seen in SHCs except in Tairāwhiti and Nelson Marlborough DHBs.

**Table 16: Gonorrhoea case numbers by clinic type and DHB, 2011**

District Health Board	Clinic type			Total
	SHC	FPC	SYHC	
Northland	40	1	2	43
Auckland region <sup>a</sup>	318	33	2	353
Waikato	81	28	1	110
Lakes	24	-	-	24
Bay of Plenty	53	0	-	53
Tairāwhiti	29	40	-	69
Taranaki	53	5	-	58
Hawke's Bay	23	-	13	36
Whanganui	13	3	2	18
MidCentral	24	-	2	26
Wellington region <sup>b</sup>	29	12	13	54
Nelson Marlborough	12	15	-	27
West Coast	6	1	-	7
Canterbury	27	9	1	37
South Canterbury	4	2	-	6
Southern	31	3	0	34

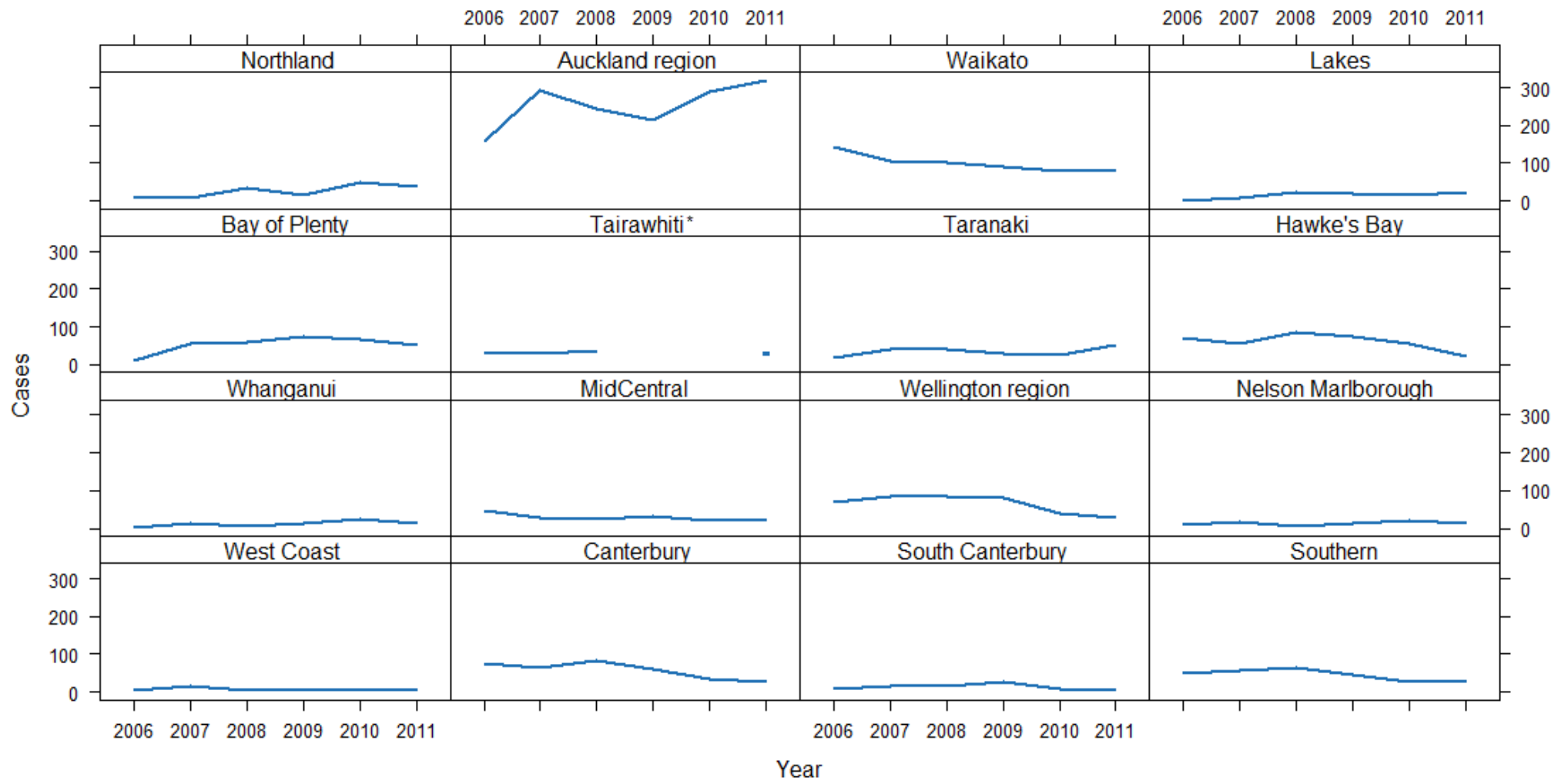
<sup>a</sup> Waitemata, Auckland and Counties Manukau DHBs

<sup>b</sup> Hutt Valley and Capital and Coast DHBs

#### Trends in DHB counts

Gonorrhoea case numbers in SHCs from 2006 to 2011 are presented by DHB in Figure 28. SHCs in most DHBs experienced a peak in gonorrhoea case numbers of in 2008/2009, however in the Auckland region and Waikato DHB there was an increase in case numbers again between 2010 and 2011 (291 to 318 cases and 79 to 81 cases, respectively).

Figure 28: Gonorrhoea case numbers in SHCs by DHB, 2006-2011



\* data was not available for Tairawhiti DHB for 2009-2010

## Sex, age and ethnicity distribution of gonorrhoea cases

### Annual 2011 analysis

Sex was recorded for all gonorrhoea cases. More cases of gonorrhoea were seen in males in SHCs, while in FPCs and SYHCs more cases were seen in females. Table 17 presents the number of cases of gonorrhoea by sex and clinic type for 2011.

**Table 17: Gonorrhoea case by sex and clinic type, 2011**

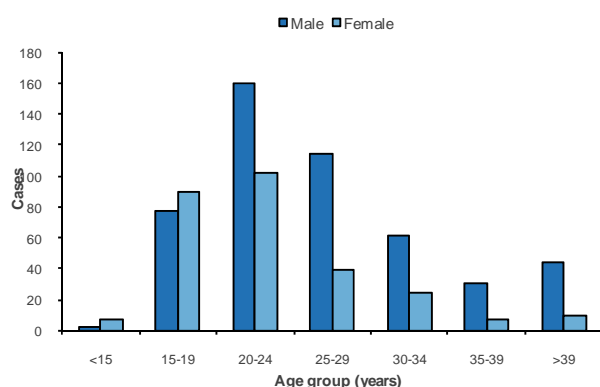
Clinic type	Number of cases		
	Male	Female	Total
SHC	488	279	767
FPC	45	107	152
SYHC	13	23	36
<b>Total</b>	<b>546</b>	<b>409</b>	<b>955</b>

Age was recorded for all gonorrhoea cases except one in 2011. A large proportion of the reported cases of gonorrhoea were aged less than 25 years – 57.1% (438/767) in SHCs, 83.6% (127/152) in FPCs and 88.6% (31/35) in SYHCs. The mean age of gonorrhoea cases was 25.4 years in SHCs, 20.6 years in FPCs and 20.4 years in SYHCs.

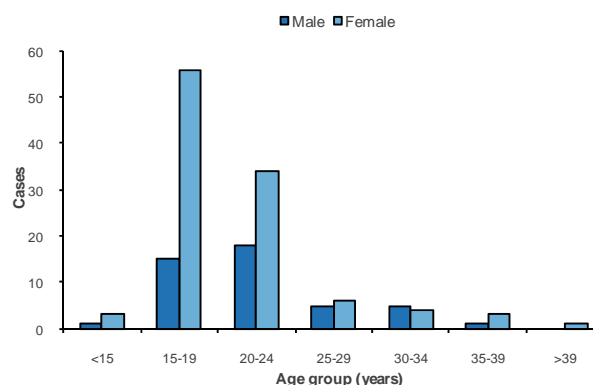
The number of males with gonorrhoea was highest in the 20 to 24 years age group in SHCs and FPCs (160 cases and 18 cases, respectively), while the highest number of males with gonorrhoea was in the 15 to 19 years age group in SYHCs (6 cases). The number of females with gonorrhoea was highest in the 20 to 24 years age group in SHCs and SYHCs (102 cases and 13 cases, respectively), while the highest number of females with gonorrhoea was in the 15 to 19 years age group in FPCs (56 cases).

Figure 29 and Figure 30 present the number of confirmed cases of gonorrhoea by age group and sex for 2011 in SHCs and FPCs.

**Figure 29: Gonorrhoea case numbers reported by SHCs by age group and sex, 2011**



**Figure 30: Gonorrhoea case numbers reported by FPCs by age group and sex, 2011**



Note: In FPCs the male to female ratio of attendees is 1:23

Ethnicity was recorded by SHCs for 98.0% (752/767) of the reported cases of gonorrhoea. The highest percentage of gonorrhoea cases reported by SHCs were of European ethnicity (41.4%, 311 cases), followed by Māori (39.0%, 293 cases), Pacific Peoples (14.6%, 110 cases) and Other (5.1%, 38 cases) ethnicity (Table 18). Ethnicity was recorded by FPCs for 96.7% (147/152) of the reported cases. The highest percentage of gonorrhoea cases reported by FPCs were of Māori ethnicity (63.9%, 94 cases), followed by European (26.5%, 39 cases), Pacific Peoples (7.5%, 11 cases) and Other (2.0%, 3 cases) ethnicity. Ethnicity was recorded by SYHCs for 97.2% (35/36) of the reported cases. The highest percentage of gonorrhoea cases reported by SYHCs were of Māori ethnicity (57.1%, 20 cases), followed by European (37.1%, 13 cases), Pacific Peoples and Other (2.9%, 1 case each) ethnicity.

**Table 18: Gonorrhoea cases by ethnicity and clinic setting, 2011**

Ethnicity	Clinic type		
	SHC	FPC	SYHC
European	311	39	13
Māori	293	94	20
Pacific Peoples	110	11	1
Other	38	3	1
Unknown	15	5	1
<b>Total</b>	<b>767</b>	<b>152</b>	<b>36</b>

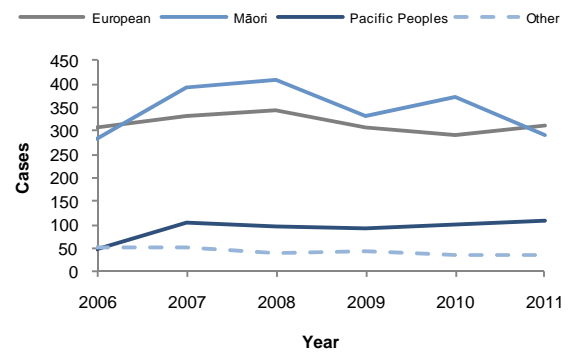
### Trends in sex, age and ethnicity

Between 2006 and 2011, there was a peak in the number of female cases of gonorrhoea reported by SHCs in the 15 to 19 and 20 to 24 years age groups in 2007 (164 and 118 cases, respectively). In 2008, a peak in the number of male gonorrhoea cases reported by SHCs occurred in the 15 to 19 and 20 to 24 years age groups (127 and 202 cases, respectively) (Figure 33).

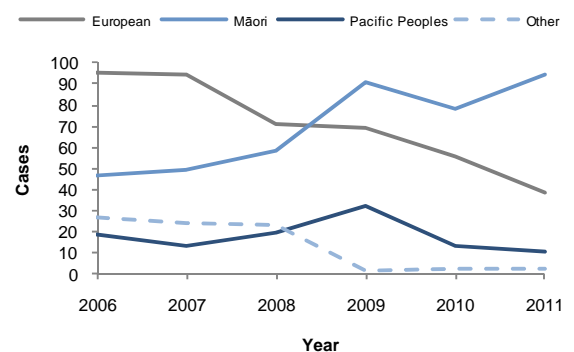
FPCs predominantly diagnosed gonorrhoea in females in the 15 to 19 and 20 to 24 years age groups, and a steady decrease occurred in the number of cases in the 15 to 19 years age group (91 to 56 cases) between 2006 and 2011 (Figure 34). A peak in the number of cases in the 20 to 24 years age group occurred in 2009 (68 cases) in FPCs.

Figure 31 and Figure 32 present the number of cases of gonorrhoea reported from SHCs and FPCs by ethnicity between 2006 and 2011. Of note, there was an increase in the number of cases seen in Māori (47 to 94 cases) in FPCs. Of the 94 cases of gonorrhoea in Māori reported by FPCs in 2011, 37 were reported in Tairāwhiti DHB. There was a decrease in the number of gonorrhoea cases in the European (95 to 39 cases) and Other (27 to 3 cases) ethnic groups reported by FPCs between 2006 and 2011.

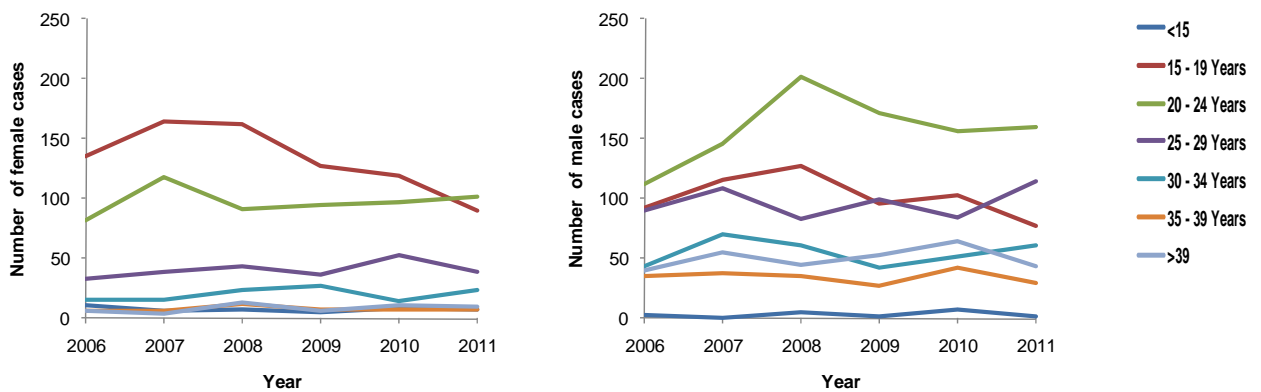
**Figure 31: Gonorrhoea cases reported from SHCs by ethnicity, 2008-2011**



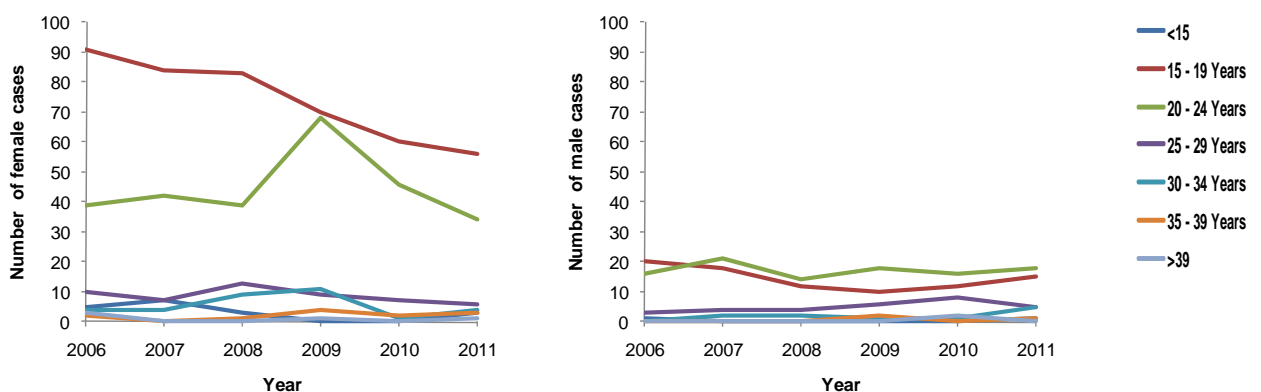
**Figure 32: Gonorrhoea cases reported from FPCs by ethnicity, 2008-2011**



**Figure 33: Gonorrhoea cases in SHCs by sex and age-group, 2006-2011**



**Figure 34: Gonorrhoea cases in FPCs by sex and age-group, 2006-2011**



## Site of infection

### Annual 2011 analysis

In 2011, gonorrhoea cases were most commonly confirmed from a urogenital site in all clinic types, as follows: 90.2% of SHC cases (692 cases), 93.4% of FPC cases (142 cases), and 100% of SYHC cases (36 cases) (Table 19).

In SHCs, the next most common site was anorectal at 7.7% (59 cases), followed by the pharynx at 4.6% (35 cases).

**Table 19: Gonorrhoea cases by site of infection and clinic setting, 2011**

Site	Clinic type		
	SHC	FPC	SYHC
Urogenital	692	142	36
Anorectal	59	0	1
PID/epididymitis	12	11	0
Pharynx	35	0	0
Other site	1	0	0
<b>Total<sup>a</sup></b>	<b>767</b>	<b>152</b>	<b>36</b>

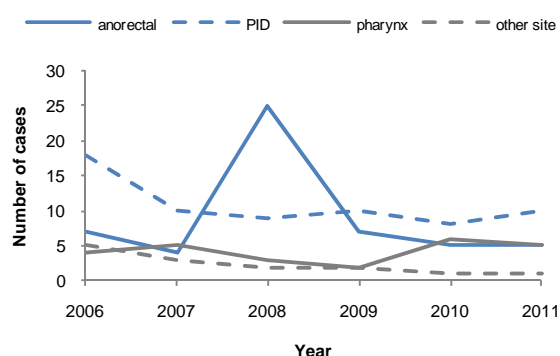
<sup>a</sup> Cases with the infection confirmed at more than one site are included in the tally for each site but are only counted once in the total.

Complicated infections (epididymitis in males and PID in females) were reported for 1.6% (12/767) of gonorrhoea cases in SHCs, 7.2% (11/152) in FPCs and none of the cases SYHCs. A total of two males, both in SHCs, were reported with epididymitis. The two cases were both aged less than 25 years; and of Māori and Other ethnicity. A total of 21 females (10 in SHCs and 11 in FPCs) were reported with PID, 76.1% (16 cases) of whom were aged less than 25 years. Of the 20 female cases (95.2%) where ethnicity was recorded, 14 cases (70%) were of Māori ethnicity and six cases (30%) were of European ethnicity.

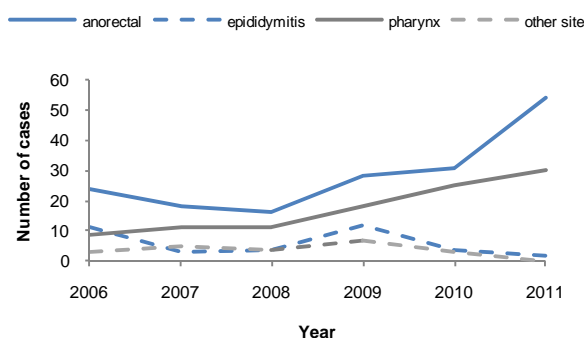
### Trends in site of infection

Figure 35 and Figure 36 present the trends in non-urogenital gonorrhoea sites reported by SHCs between 2006 and 2011 for females and males. In females there was a 44% decrease in the number of PID cases caused by gonorrhoea (from 18 to 10 cases) from 2006 to 2011, while anorectal site infections peaked in 2008 (25 cases) but remained low in other years. In males, there has been an increase in anorectal and pharyngeal gonorrhoea infections reported by SHCs (24 to 52 cases and 9 to 30 cases, respectively) between 2006 and 2011. Epididymitis and gonorrhoea infections at other sites have remained low.

**Figure 35: Site of infection, non-urogenital gonorrhoea cases in females in SHCs, 2006-2011**



**Figure 36: Site of infection, non-urogenital gonorrhoea cases in males in SHCs, 2006-2011**





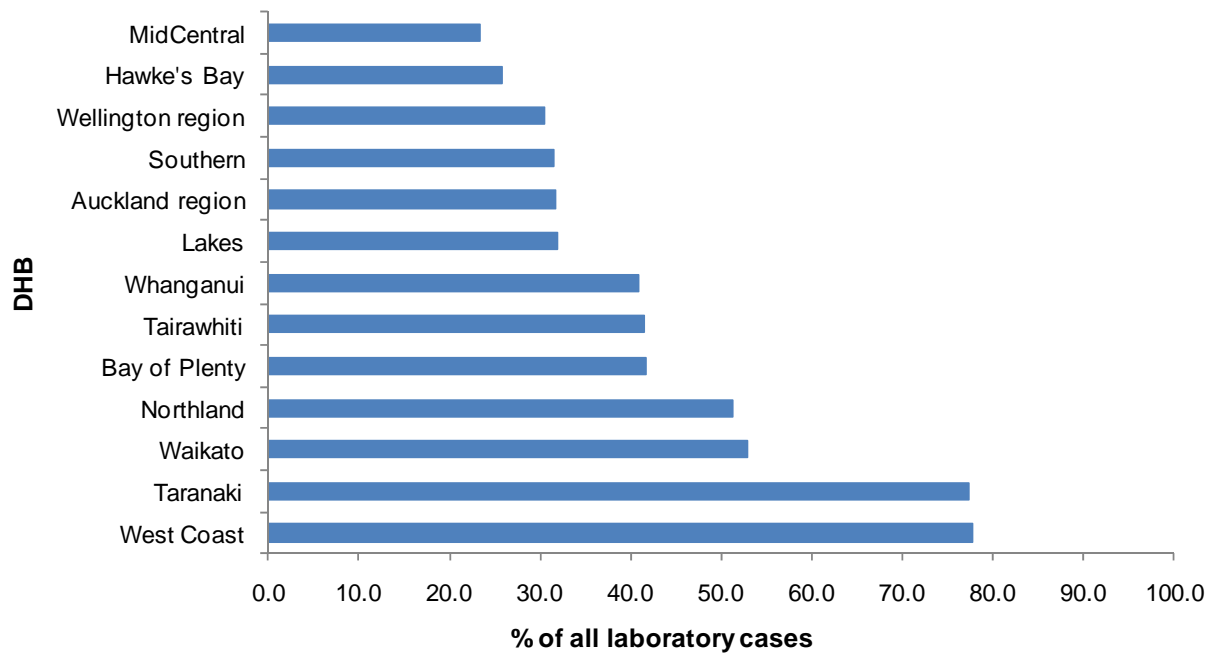
## Comparison of laboratory and clinic surveillance

For DHBs that meet the selection criteria (Appendix B) for gonorrhoea laboratory reporting and that have clinics which participate in the STI surveillance programme, clinic cases as a proportion of laboratory cases are presented in Figure 37.

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 West Coast DHB (77.8%), followed by Taranaki (77.3%) and Waikato (52.9%) DHBs. The lowest proportions of gonorrhoea cases seen in a participating clinic were in MidCentral (23.4%) and Hawke's Bay (25.7%) DHBs.

**Figure 37: Cases of gonorrhoea seen in participating clinics as a proportion (%) of all positive laboratory tests, by DHB, 2011**





# GENITAL HERPES



## GENITAL HERPES (FIRST PRESENTATION)

### Key findings

- In 2011, 1166 first presentations of genital herpes were reported. Eight hundred and sixty-nine cases were seen in SHCs, 189 cases in FPCs and 108 cases in SYHCs.
- Since 2006, there has been a steady increase in the case numbers seen in each clinic setting.

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 if 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

#### Annual 2011 analysis

In 2011, the clinic counts of genital herpes (first presentation) reported by SHCs, FPCs and SYHCs were 869 cases, 189 cases and 108 cases, respectively (Table 20).

**Table 20: Genital herpes (first presentation) case numbers by clinic type, 2011**

Clinic type	Total number of cases
SHC	869
FPC	189
SYHC	108
<b>Total</b>	<b>1166</b>

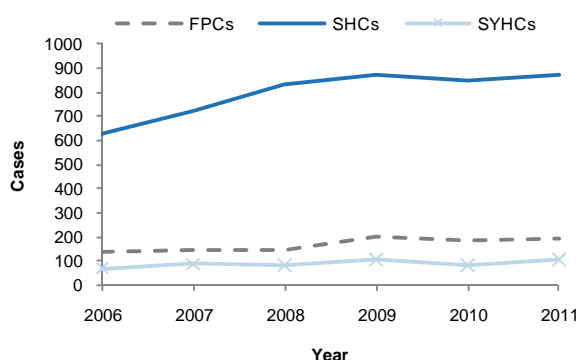
#### Trends in national totals

Between 2010 and 2011, genital herpes clinic case counts increased by 2.7% in SHCs (846 to 869 cases), 0.5% in FPCs (188 to 189 cases) and 33.3% in SYHCs (81 to 108 cases).

From 2006 to 2011, genital herpes clinic case counts increased by 38.3% in SHCs (626 to 869 cases), 51.2% in FPCs (125 to 189 cases) and by 56.5% in SYHCs (69 to 108 cases) (Figure 38).

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

**Figure 38: Genital herpes (first presentation) cases by clinic type, 2006 to 2011**



### DHB counts

#### Annual 2011 analysis

Clinics in 19 DHBs contributed to genital herpes surveillance in 2011. The numbers of genital herpes cases in each clinic type by DHB are presented in Table 21. The highest case numbers of genital herpes in SHCs were seen in Auckland region (198 cases) and Waikato (129 cases) DHBs. In DHBs with both SHCs and FPCs, higher genital herpes case counts were seen in SHCs, with the exception of Nelson Marlborough.

**Table 21: Genital herpes (first presentation) case numbers by clinic type and DHB, 2011**

District Health Board	SHC	FPC	SYHC	Total
	Cases	Cases	Cases	Cases
Northland	39	0	0	39
Auckland region <sup>a</sup>	198	20	14	232
Waikato	129	15	-	146
Lakes	14	-	-	14
Bay of Plenty	89	0	-	89
Tairāwhiti	0	10	-	10
Taranaki	69	2	-	71
Hawke's Bay	14	-	11	25
Whanganui	6	7	1	14
MidCentral	40	-	3	43
Wellington region <sup>b</sup>	67	32	29	128
Nelson Marlborough	36	40	-	76
West Coast	15	2	0	17
Canterbury	71	41	14	126
South Canterbury	12	6	-	18
Southern	70	14	34	118

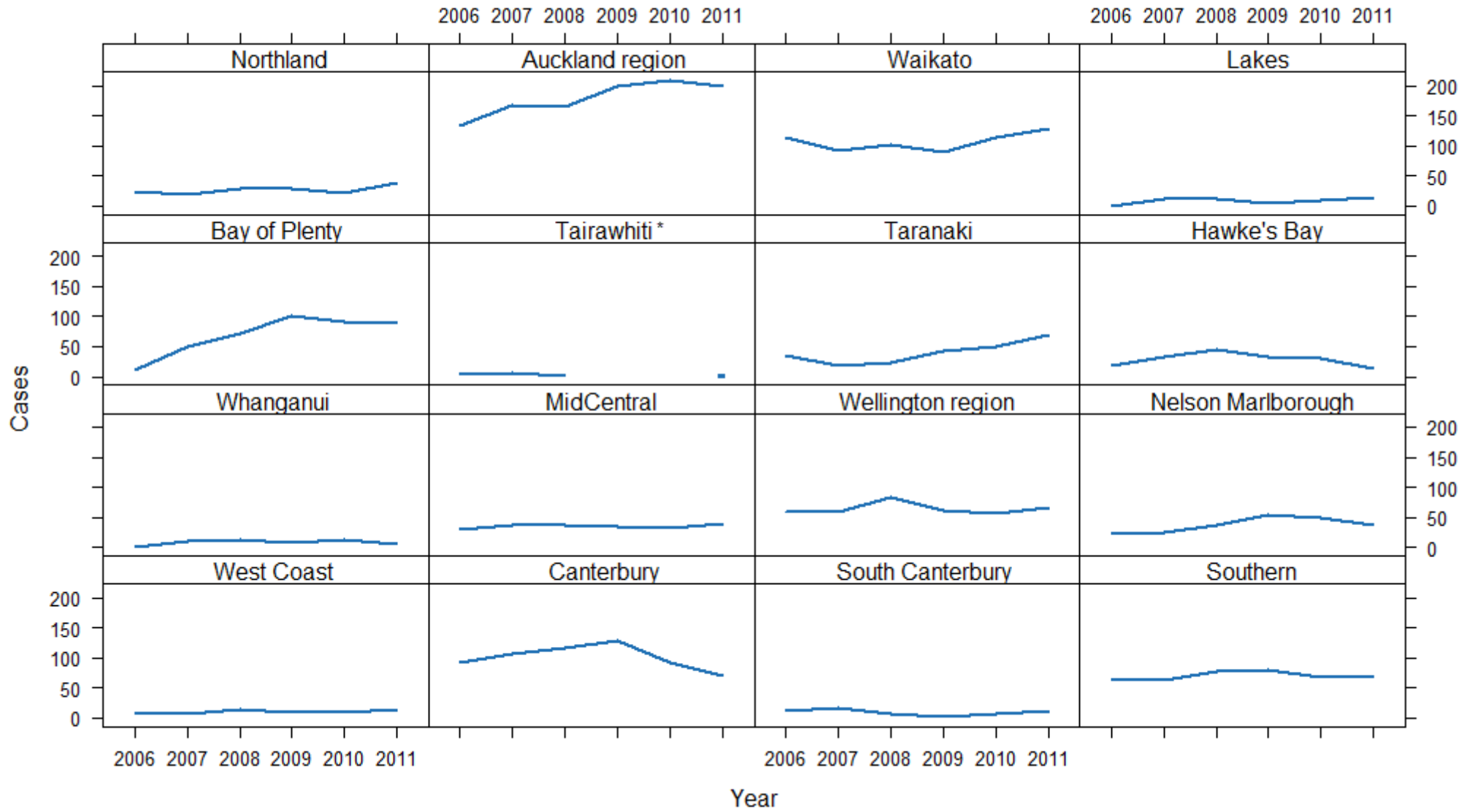
<sup>a</sup> Waitemata, Auckland and Counties Manukau DHBs

<sup>b</sup> Hutt Valley and Capital and Coast DHBs

#### Trends in DHB counts

Genital herpes case numbers in SHCs from 2006 to 2011 are presented by DHB in Figure 39. There is variation in the trends seen among DHBs. For example, there are increasing case numbers over the six-year period in the Auckland region and Taranaki DHB, while decreasing case number were seen in Canterbury and Nelson Marlborough DHBs during the previous two years.

Figure 39: Genital herpes case numbers in SHCs by DHB, 2006-2011



\* data was not available for Tairawhiti DHB for 2009-2010

## Sex, age and ethnicity distribution of genital herpes

### Annual 2011 analysis

Sex was recorded for all cases of genital herpes. More cases of genital herpes were seen in males than females at SHCs (55.8%, 485/869 cases). In contrast, more cases of genital herpes were seen in females than males at FPCs (85.7%; 162/189 cases), and SYHCs (75.0%, 81/108 cases) (Table 22).

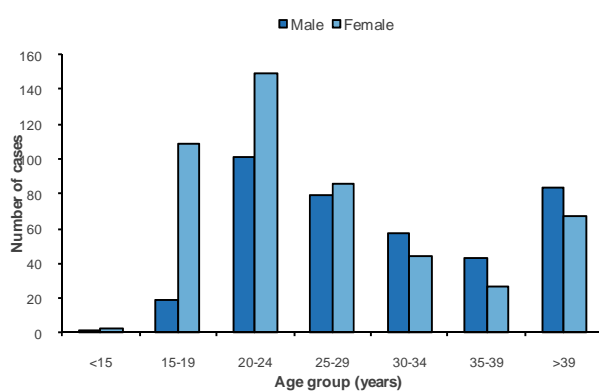
**Table 22: Genital herpes (first presentation) cases by sex and clinic type, 2011**

Clinic type	Number of cases		
	Male	Female	Total
SHC	485	384	869
FPC	27	162	189
SYHC	27	81	108
<b>Total</b>	<b>539</b>	<b>627</b>	<b>1166</b>

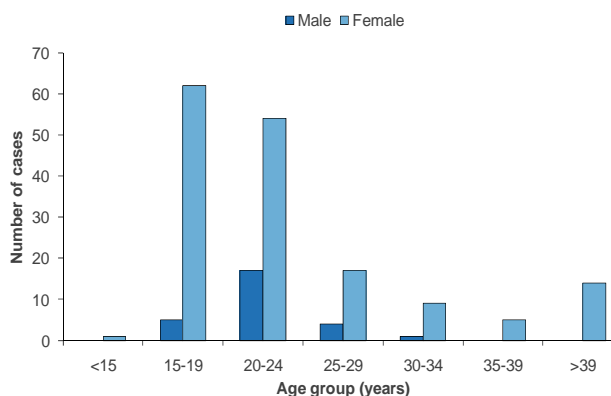
Age was recorded for 99.7% (1162/1166) of genital herpes cases. In SHCs, 44.0% (382/869) of the reported cases of genital herpes were aged less than 25 years. This proportion was larger in FPCs (73.5%, 139/189) and SYHCs (89.4%, 93/104). The mean age of genital herpes cases was 29.2 years in SHCs, 23.8 years in FPCs and 21.5 years in SYHCs.

Across all clinic types, the number of males with genital herpes was highest in the 20 to 24 years age group (101 cases in SHCs, 17 cases in FPCs, and 13 cases in SYHCs). For females, case numbers were highest in the 15 to 19 years age group in FPCs (62 cases), and in the 20 to 24 years age group in SHCs (149 cases) and SYHCs (51 cases). Figure 40 and Figure 41 present the number of genital herpes cases reported by age group and sex for SHCs and FPCs in 2011.

**Figure 40: Number of cases of genital herpes reported by SHCs by age group and sex, 2011**



**Figure 41: Number of cases of genital herpes reported by FPCs by age group and sex, 2011**



Ethnicity was recorded by SHCs for 97.6% (848/869) of the reported cases of genital herpes. The highest percentage of cases recorded by SHCs were of European ethnicity (75.9%, 644 cases), followed by Māori (14.5%, 123 cases), Other (7.5%, 64 cases) and Pacific Peoples (2.0%, 17 cases) ethnicity. Ethnicity was recorded by FPCs for 95.8% (181/189) of the reported cases of genital herpes. The highest percentage of cases recorded by FPCs were of European ethnicity (80.1%, 145 cases), followed by Māori (13.3%, 24 cases), Other (3.9%, 7 cases) and Pacific Peoples (2.8%, 5 cases) ethnicity. Ethnicity was recorded by SYHCs for 95.4% (103/108) of the reported cases of genital herpes. The highest percentage of cases recorded by SYHCs were of European ethnicity (74.8%, 77 cases), followed by Māori and Other (11.7%, 12 cases each), and Pacific Peoples (1.9%, 2 cases) ethnicity.

Table 23 presents the number of genital herpes cases by ethnicity and clinic setting for 2011.

**Table 23: Genital herpes (first presentation) cases by ethnicity and clinic type, 2011**

Ethnicity	Clinic type		
	SHC	FPC	SYHC
European	644	145	77
Māori	123	24	12
Pacific Peoples	17	5	2
Other	64	7	12
Unknown	21	8	5
<b>Total</b>	<b>869</b>	<b>189</b>	<b>108</b>



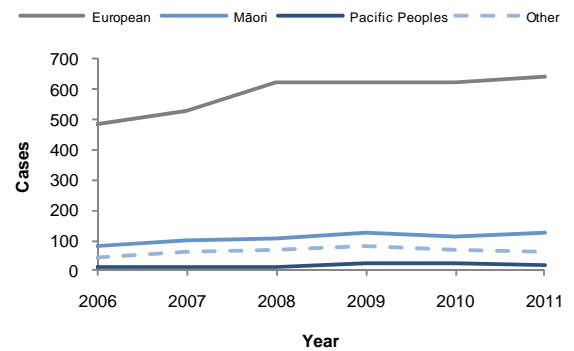
### Trends in sex, age and ethnicity

Between 2006 and 2011, the highest numbers of genital herpes cases in SHCs were in females in the 15 to 19 years and 20 to 24 years age groups (Figure 44). A slightly increasing or stable trend in case numbers was observed in all age groups, except for males in the 15 to 19 years age group where the numbers decreased over the six-year period (29 cases in 2006 to 19 cases in 2011).

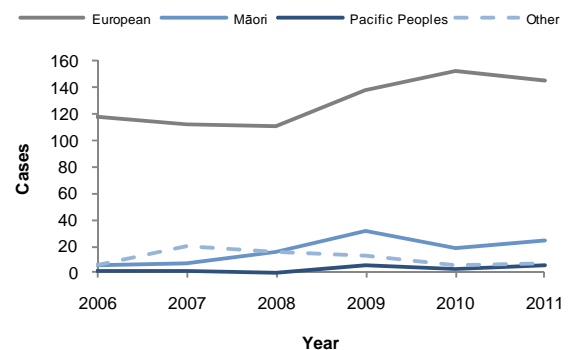
In FPCs, the highest numbers of genital herpes cases were in females in the 15 to 19 years and 20 to 24 years age groups, both of which showed an increase in cases from 2006 to 2011 (Figure 45). Case numbers remained stable over the six-year period for all other age groups in males and females, except for a slightly increasing trend among males in the 20 to 24 years age group.

Figure 42 and Figure 43 present the number of first presentations of genital herpes reported from SHCs and FPCs by ethnicity between 2006 and 2011. Cases of genital herpes were substantially more common in those of European ethnicity in both clinic settings over the six-year period. In SHCs, there was an increase in diagnoses in all ethnic groups. The largest relative increases were seen in the Pacific Peoples (70%, 10 to 17 cases) and Māori (54%, 80 to 123 cases) ethnic groups. In FPCs, there was also an increase in diagnoses in all ethnic groups, with the largest relative increase seen in Māori (380%, 5 to 24 cases).

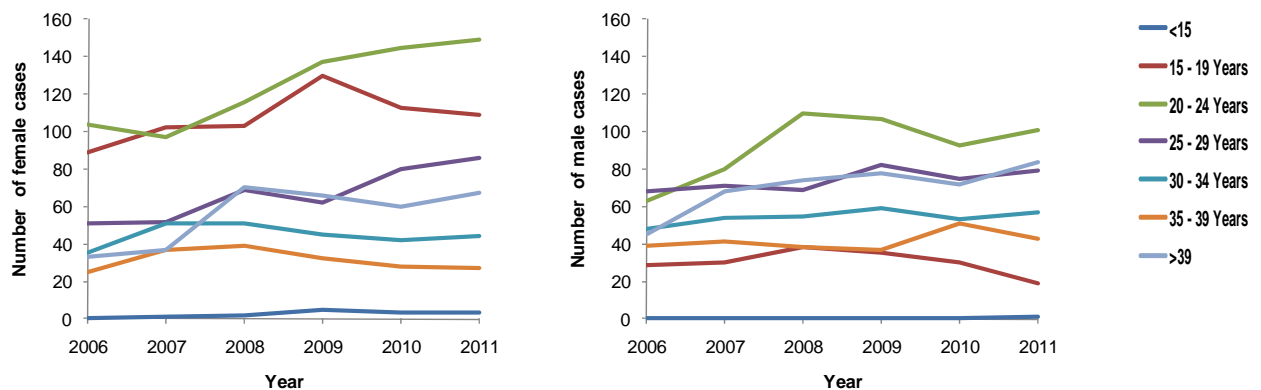
**Figure 42: Number of genital herpes (first presentation) cases reported from SHCs, by ethnicity, 2006-2011**



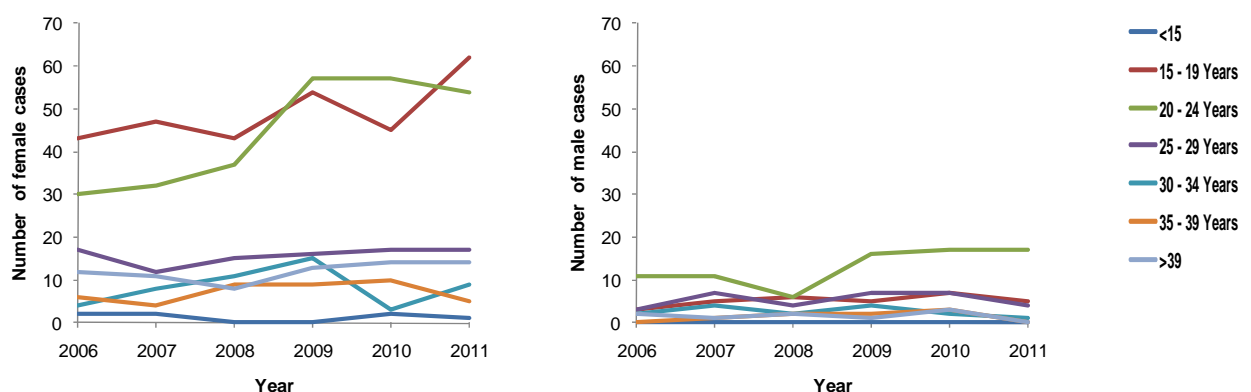
**Figure 43: Number of genital herpes (first presentation) cases reported from FPCs, by ethnicity, 2006-2011**



**Figure 44: Genital herpes (first presentation) cases in SHCs by sex and age-group, 2006-2011**



**Figure 45: Genital herpes (first presentation) cases in FPCs by sex and age-group, 2006-2011**





## GENITAL WARTS



## GENITAL WARTS (FIRST PRESENTATION)

### Key findings

- In 2011, 2905 first presentations of genital warts were reported. Of these, 2469 were seen in SHCs.
- Case numbers decreased in all clinic settings between 2010 and 2011.
- Since 2008 a marked decrease has occurred in case numbers reported in females aged 15 to 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 and anal cancers. However, approximately 90% of genital warts are caused by HPV types 6 or 11, which are not associated with cervical 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 born from 1993 until their 20<sup>th</sup> birthday, and to the end of 2012 for those born in 1992 [8].

## Clinic surveillance of genital warts (first presentation)

### National analysis

#### Annual 2011 analysis

In 2011, genital warts was the most commonly reported viral STI in New Zealand. Clinic counts of genital warts (first presentation) reported by SHCs, FPCs and SYHCs were 2469 cases, 276 cases and 160 cases, respectively in 2011 (Table 24).

**Table 24: Genital warts (first presentation) case numbers by clinic type, 2011**

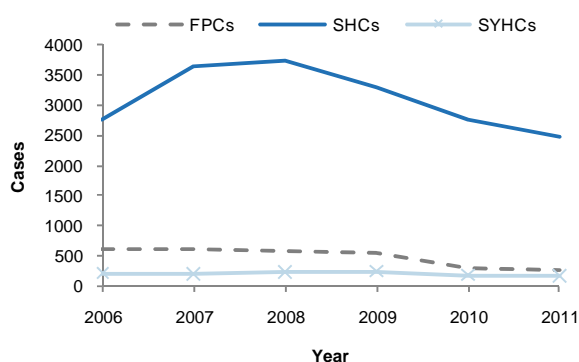
Clinic type	Total number of cases
SHC	2469
FPC	276
SYHC	160
<b>Total</b>	<b>2905</b>

#### Trends in national totals

Between 2010 and 2011, genital warts clinic case counts decreased by 10.9% in SHCs (2772 to 2469 cases), 8.6% in FPCs (302 to 276 cases), and 12.1% in SYHCs (182 to 160).

From 2006 to 2011, genital warts clinic case counts decreased by 10.6% in SHCs (2762 to 2469 cases), 51.6% in FPCs (570 to 276 cases) and 24.9% in SYHCs (213 to 160 cases) (Figure 46).

**Figure 46: Genital warts (first presentation) cases by clinic type, 2006 to 2011**



### DHB counts

#### Annual 2011 analysis

Clinics in 19 DHBs contributed to genital warts surveillance in 2011. The numbers of genital warts cases in each clinic type by DHB are presented in Table 25. The highest case numbers of genital warts in SHCs were seen in the Auckland (779 cases) and Wellington (297 cases) regions. In DHBs with both SHCs and FPCs, higher genital warts case counts were seen in SHCs.

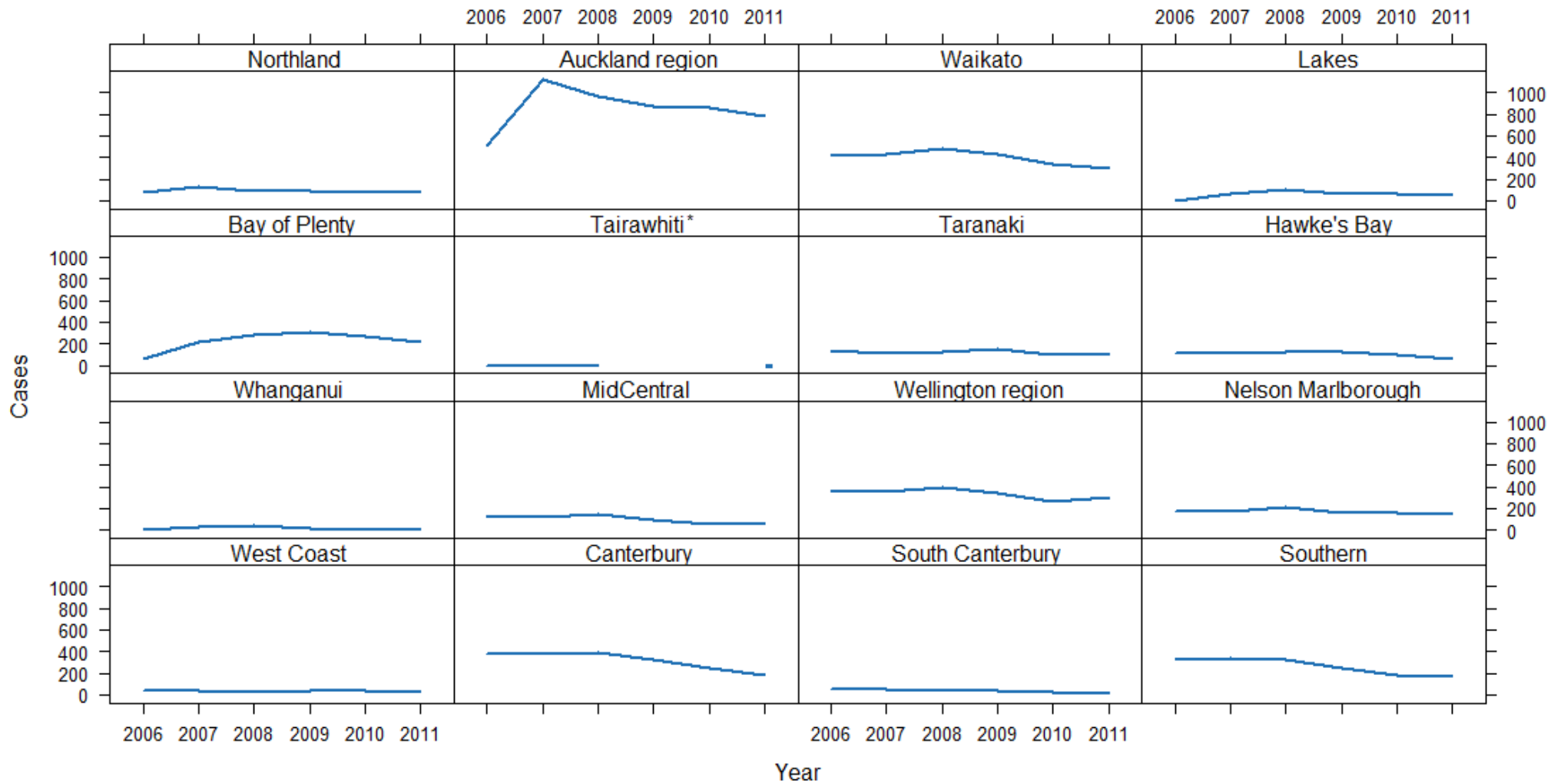
**Table 25: Genital warts (first presentation) case numbers by clinic type and DHB, 2011**

District Health Board	Clinic type			Total
	SHC	FPC	SYHC	
Northland	74	1	0	75
Auckland region <sup>a</sup>	779	78	2	859
Waikato	296	20	11	327
Lakes	56	-	-	56
Bay of Plenty	210	1	-	211
Tairāwhiti	0	9	-	9
Taranaki	98	0	-	98
Hawke's Bay	54	-	14	68
Whanganui	9	4	0	13
MidCentral	68	-	9	77
Wellington region <sup>b</sup>	297	54	70	421
Nelson Marlborough	152	26	-	178
West Coast	28	3	-	31
Canterbury	176	37	14	227
South Canterbury	10	9	-	19
Southern	162	34	40	236

#### Trends in DHB counts

Genital warts case numbers in SHCs from 2006 to 2011 are presented by DHB in Figure 47. SHCs in most DHBs have reported decreasing case numbers of genital warts since 2008/2009.

Figure 47: Genital warts case numbers in SHCs by DHB, 2006-2011



\* data was not available for Tairawhiti DHB for 2009-2010

## Sex, age and ethnicity distribution of genital warts

### Annual 2011 analysis

Sex was recorded for all of the genital warts cases. More cases of genital warts were seen in males than females at SHCs (54.3%, 1340/2469). In contrast, more cases of genital warts were seen in females than males at FPCs (67.4%, 186/276) and SYHCs (61.9%, 99/160) (Table 26).

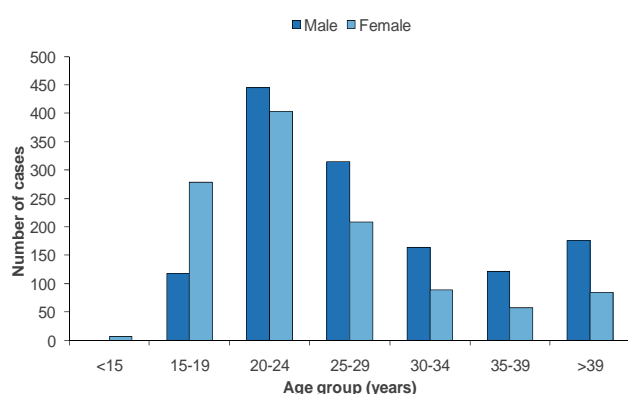
**Table 26: Genital warts (first presentation) cases by sex and clinic type, 2011**

Clinic type	Number of cases		
	Male	Female	Total
SHC	1340	1129	2469
FPC	90	186	276
SYHC	61	99	160
<b>Total</b>	<b>1491</b>	<b>1414</b>	<b>2905</b>

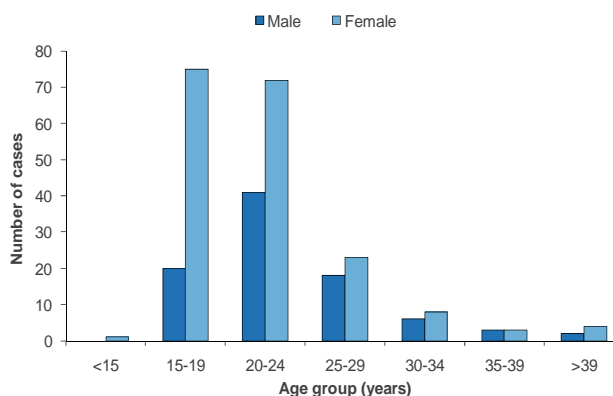
Age was recorded for 99.6% (2894/2905) of genital warts cases. In SHCs, 50.7% (1252/2469) of the reported cases of genital warts were aged less than 25 years. The proportion of cases aged less than 25 years was larger in FPCs (75.7%, 209/276) and SYHCs (91.9%, 137/149) than in SHCs. The mean age of cases of genital warts was 27.1 years in SHCs, 22.4 years in FPCs and 21.1 years in SYHCs.

The number of males with genital warts was highest in the 20 to 24 years age group across all clinic types (445 cases in SHCs, 41 cases in FPCs and 38 cases in SYHCs). For females, case numbers were highest in the 15 to 19 years age group in FPCs (75 cases), and in the 20 to 24 years age group in SHCs (403 cases) and SYHCs (58 cases). Figure 48 and Figure 49 present the number of genital warts cases reported by age group and sex for SHCs and FPCs for 2011.

**Figure 48: Number of cases of genital warts reported by SHCs by age group and sex, 2011**



**Figure 49: Number of cases of genital warts reported by FPCs by age group and sex, 2011**



Ethnicity was recorded by SHCs for 97.3% (2402/2469) of the reported cases of genital warts. The highest percentage of cases reported by SHCs were of European ethnicity (71.4%, 1715 cases), followed by Māori (16.2%, 388 cases), Other (7.6%, 183 cases) and Pacific Peoples (4.8%, 116 cases) ethnicity. Ethnicity was recorded by FPCs for 93.8% (259/276) of the reported cases. The highest percentage of cases reported by FPCs were of European ethnicity (80.3%, 208 cases), followed by Māori (15.1%, 39 cases), and Pacific Peoples and Other (2.3%, 6 cases each) ethnicity. Ethnicity was recorded by SYHCs for 96.9% (155/160) of the reported cases. The highest percentage of cases reported by SYHCs were of European ethnicity (71.0%, 110 cases), followed by Māori (18.7%, 29 cases), Other (9.0%, 14 cases) and Pacific Peoples (1.3%, 2 cases) ethnicity.

Table 27 presents the number of genital warts cases by ethnicity and clinic setting for 2011.

**Table 27: Genital warts (first presentation) cases by ethnicity and clinic type, 2011**

Ethnicity	Clinic type		
	SHC	FPC	SYHC
European	1715	208	110
Māori	388	39	29
Pacific Peoples	116	6	2
Other	183	6	14
Unknown	67	17	5
<b>Total</b>	<b>2469</b>	<b>276</b>	<b>160</b>

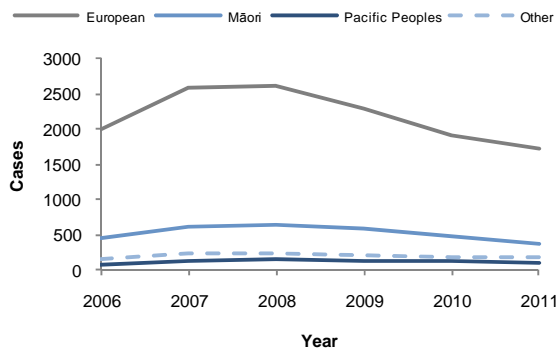


### Trends in sex, age and ethnicity

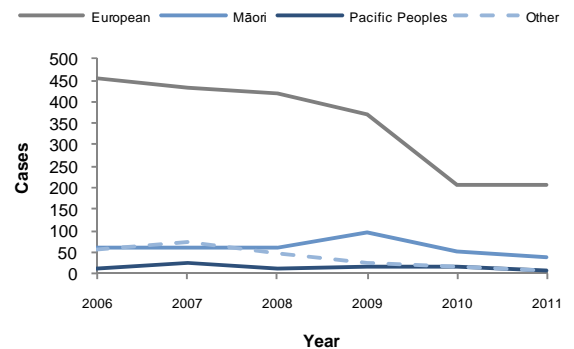
Between 2006 and 2011, there was a notable decrease in the genital warts case numbers among females in SHCs in the 15 to 19 years age group (Figure 52). Case numbers among males and females in the 20 to 24 years age group increased slightly in 2008, followed by decreases between 2009 and 2011. In FPCs, notable decreases were observed among females in the 15 to 19 years age group, as well as in the 20 to 24 years age group (Figure 53).

Figure 50 and Figure 51 present genital warts case numbers reported from SHCs and FPCs by ethnicity between 2006 and 2011. In SHCs, there was peak in diagnoses in those of European, Māori and Pacific ethnicity in 2008. Since 2008, case numbers seen in each ethnic group have decreased annually. In FPCs, the numbers diagnosed in every ethnic group have decreased since 2006.

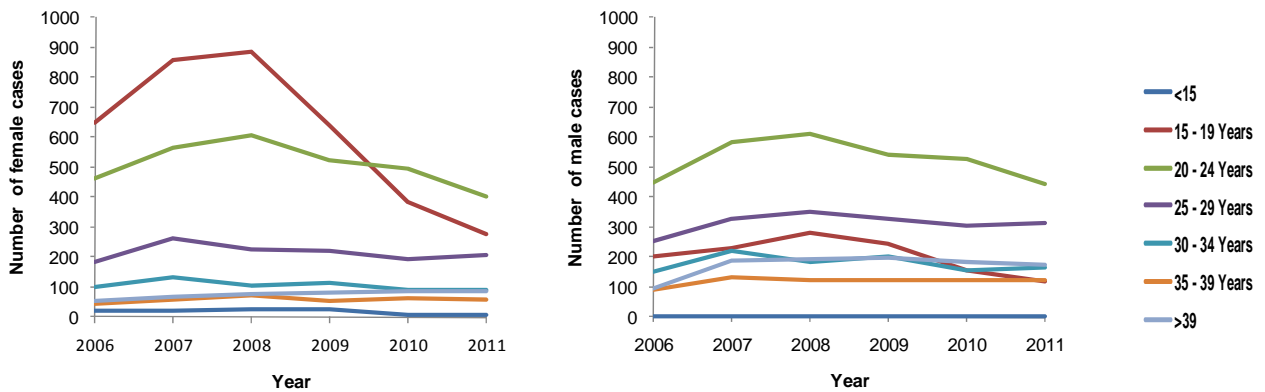
**Figure 50: Number of genital warts (first presentation) cases reported from SHCs by ethnicity, 2008-2011**



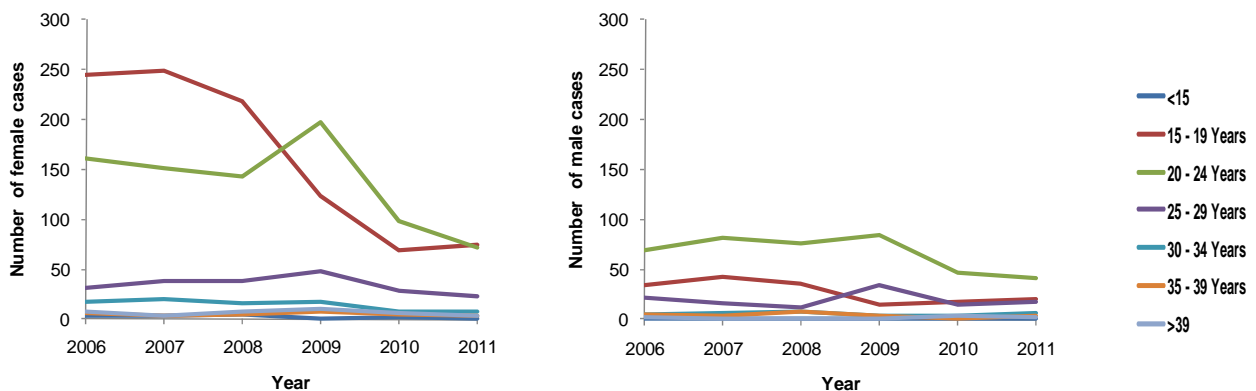
**Figure 51: Number of genital warts (first presentation) cases reported from FPCs, by ethnicity, 2008-2011**



**Figure 52: Number of genital warts (first presentation) cases in SHCs by sex and age-group, 2006-2011**



**Figure 53: Number of genital warts (first presentation) cases in FPCs by sex and age-group, 2006-2011**





# INFECTIOUS SYPHILIS



# INFECTIOUS SYPHILIS

## Key findings

- In 2011, 82 syphilis cases were seen in SHCs, with one further case seen in an FPC.
- Between 2010 and 2011, the number of syphilis cases reported by SHCs decreased by 31.1%.
- Males comprised 83.1% of cases.

Infectious syphilis (primary, secondary or early latent) is caused by *Treponema pallidum*. 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 [9]. Only cases of infectious syphilis (primary, secondary and early latent) are reported by clinics for surveillance purposes.

## Clinic surveillance of infectious syphilis

### National analysis

#### Annual 2011 analysis

In 2011, 82 cases of infectious syphilis were reported by SHCs, one case was reported by FPCs and no cases were reported by SYHCs (Table 28).

**Table 28: Infectious syphilis case numbers by clinic type, 2011**

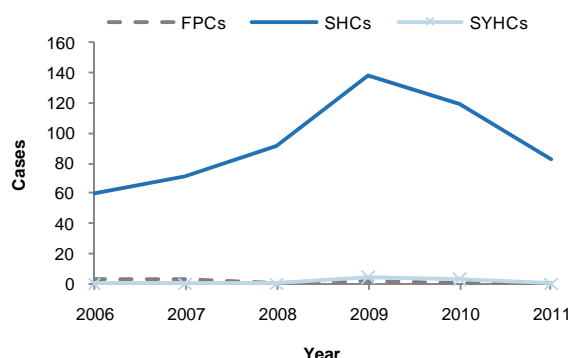
Clinic type	Total number of cases
SHC	82
FPC	1
SYHC	0
<b>Total</b>	<b>83</b>

#### Trends in national totals

Between 2010 and 2011, the infectious syphilis case count reported by SHCs decreased by 31.1% (119 to 82 cases).

From 2006 to 2011, the infectious syphilis clinic case count reported by SHCs increased by 36.7% (60 to 82 cases) (Figure 54).

**Figure 54: Infectious syphilis case numbers by clinic type, 2006 to 2011**



### DHB counts

#### Annual 2011 analysis

Clinics in 19 DHBs contributed to infectious syphilis surveillance in 2011. The numbers of infectious syphilis cases seen in SHCs by DHB are presented in Table 29. The highest case numbers of syphilis in SHCs were seen in Auckland (44 cases) and Wellington (14 cases) regions.

**Table 29: Infectious syphilis case numbers in SHCs by DHB, 2011**

District Health Board	Cases
Northland	2
Auckland region <sup>a</sup>	44
Waikato	3
Lakes	0
Bay of Plenty	6
Tairāwhiti	0
Taranaki	1
Hawke's Bay	1
Whanganui	0
MidCentral	2
Wellington region <sup>b</sup>	14
Nelson Marlborough	4
West Coast	0
Canterbury	3
South Canterbury	0
Southern	2

<sup>a</sup> Waitemata, Auckland and Counties Manukau DHBs

<sup>b</sup> Hutt Valley and Capital and Coast DHBs

### Sex, age and ethnicity distribution of syphilis

#### Annual 2011 analysis

Sex and age were recorded for all cases of infectious syphilis. Of these, 69 (83.1%) cases were male and 14 (16.9%) cases were female (Table 30).

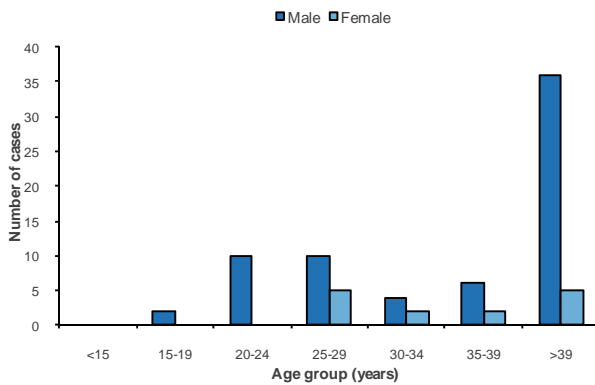
**Table 30: Infectious syphilis case numbers by sex and clinic type, 2011**

Clinic type	Number of cases		
	Male	Female	Total
SHC	68	14	82
FPC	1	0	1
SYHC	0	0	0
<b>Total</b>	<b>69</b>	<b>14</b>	<b>83</b>

A large proportion (83.1%, 69/83) of the reported syphilis cases were aged 25 years and over, with a mean age of 38.8 years (range: 17–74 years).

The number of males with syphilis was highest in the 39 years and over age group (36 cases). For females, the highest numbers of cases with syphilis were in the 20 to 24 years and 39 years and over age groups (5 cases each). Figure 55 presents the number of syphilis cases reported by SHCs by age group and sex for 2011.

**Figure 55: Infectious syphilis case numbers reported by SHCs by age group and sex, 2011**



Ethnicity was recorded for 98.8% (82/83) of the reported cases of syphilis. The highest percentage of cases were of European ethnicity (46.3%, 38 cases), followed by Other (24.4%, 20 cases), Pacific Peoples (20.7%, 17 cases), and Māori (8.5%, 7 cases) ethnicity (Table 31).

**Table 31: Infectious syphilis case numbers by ethnicity and clinic type, 2011**

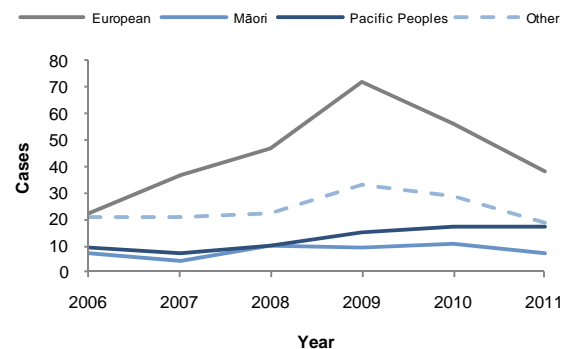
Ethnicity	Clinic type		
	SHC	FPC	SYHC
European	38	0	0
Māori	7	0	0
Pacific Peoples	17	0	0
Other	19	1	0
Unknown	1	0	0
<b>Total</b>	<b>82</b>	<b>1</b>	<b>0</b>

### Trends in sex, age and ethnicity

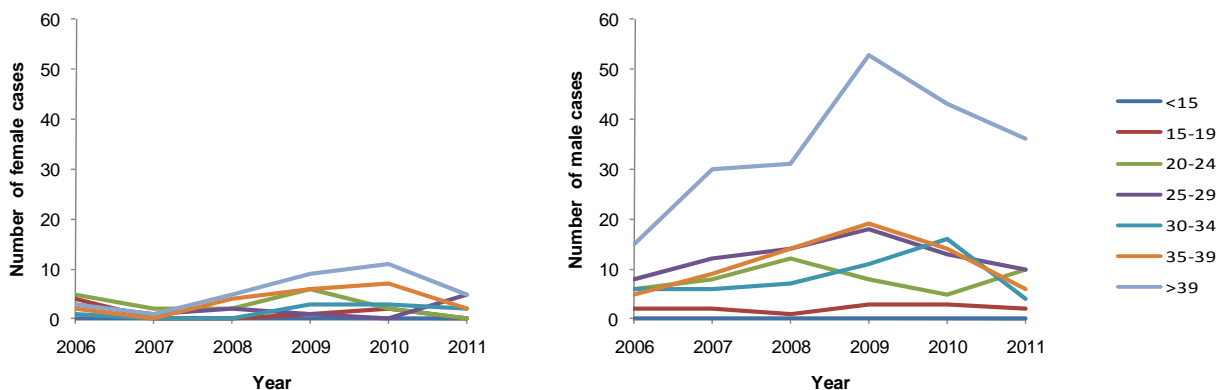
Between 2006 and 2011, a notable increase in the syphilis case numbers in males in SHCs in the 40 years and over age group occurred, with a peak of 53 cases in 2009 (Figure 57). In that year, high case counts in males were also seen in the 25 to 29 and 35 to 39 years age groups (18 cases and 19 cases, respectively). During the six-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 56 presents syphilis case numbers reported from SHCs by ethnicity between 2006 and 2011. In 2009, there was a distinct peak in case numbers in the European (72 cases) and Other (33 cases) ethnic groups, then case numbers decreased annually in the following two years. Case numbers in Māori have remained low over the six-year period, while case numbers in the Pacific Peoples ethnic group have increased (9 to 17 cases).

**Figure 56: Infectious syphilis case numbers reported from SHCs by ethnicity, 2008-2011**



**Figure 57: Infectious syphilis case numbers in SHCs by sex and age-group, 2006-2011**







## NON-SPECIFIC URETHRITIS



## NON-SPECIFIC URETHRITIS

### Key findings

- In 2011, 620 cases of NSU were reported. Of these, 595 were seen in SHCs.
- Between 2010 and 2011, the number of NSU cases seen in SHCs decreased by 17.4%.
- The mean age of males with NSU in SHCs was 31.4 years in 2011.

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

#### Annual 2011 analysis

In 2011, the clinic counts for NSU reported by SHCs, FPCs and SYHCs were 595 cases, 11 cases and 14 cases, respectively (Table 32).

Table 32: NSU case numbers by clinic type, 2011

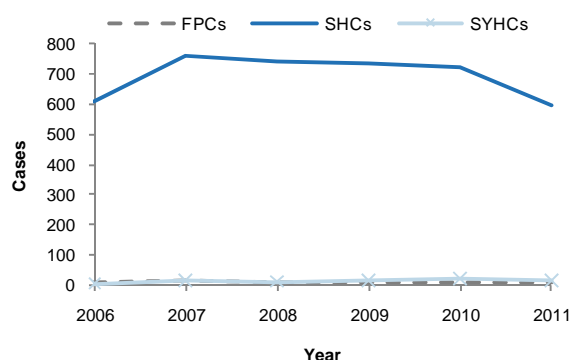
Clinic type	Total number of cases
SHC	595
FPC	11
SYHC	14
<b>Total</b>	<b>620</b>

#### Trends in national totals

Between 2010 and 2011, NSU case counts decreased by 17.4% in SHCs (from 720 to 595 cases) and by 36.3% in SYHCs (from 22 to 14 cases). There was a small increase in the number of cases in FPCs (from 9 to 11 cases)

From 2006 to 2011, NSU case counts decreased by 1.8% in SHCs (from 606 to 595 cases), with a peak in 2007 (758 cases) (Figure 58). NSU case counts in FPCs and SYHCs have remained low over the six-year period.

Figure 58: NSU cases by clinic type, 2006 to 2011



### DHB counts

#### Annual 2011 analysis

Clinics in 19 DHBs contributed to NSU surveillance in 2011. The numbers of NSU cases in SHCs by DHB are presented in Table 33. The highest case numbers of NSU in SHCs were seen in the Auckland (299 cases) and Wellington (75 cases) regions.

Table 33: NSU case numbers in SHCs by DHB, 2011

District Health Board	Cases
Northland	0
Auckland region <sup>a</sup>	299
Waikato	46
Lakes	1
Bay of Plenty	52
Tairāwhiti	0
Taranaki	22
Hawke's Bay	0
Whanganui	0
MidCentral	16
Wellington region <sup>b</sup>	75
Nelson Marlborough	20
West Coast	6
Canterbury	52
South Canterbury	0
Southern	6

a Waitemata, Auckland and Counties Manukau DHBs

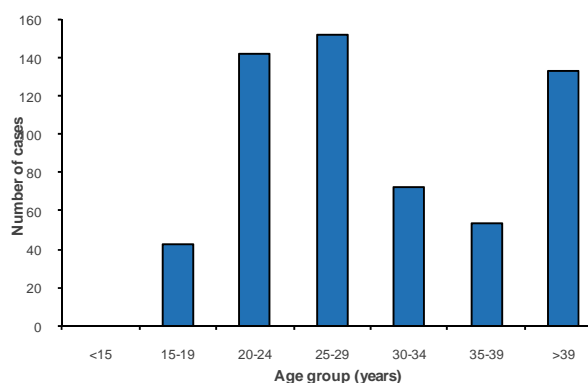
b Hutt Valley and Capital and Coast DHBs

### Age and ethnicity distribution of NSU

#### Annual 2011 analysis

Age was recorded for 99.7% (618/620) of NSU cases. In SHCs, 31.1% (185/595) 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 (54.5%, 6/11) and SYHCs (91.7%, 11/12). The mean age of NSU cases was 31.4 years in SHCs, 25.4 years in FPCs and 21.1 years in SYHCs. Figure 59 presents the number of NSU cases reported by age group and sex for SHCs in 2011.

Figure 59: NSU case numbers reported by SHCs by age group, 2011



In SHCs, ethnicity was recorded for 95.3% (567/595) of the reported cases of NSU. The highest percentage of cases were of European ethnicity (66.7%, 378 cases), followed by Māori (14.1%, 80 cases), Other (12.5%, 71 cases) and Pacific Peoples (6.7%, 38 cases) ethnicity (Table 34).

**Table 34: NSU cases numbers by ethnicity and clinic type, 2011**

Ethnicity	Clinic type		
	SHC	FPC	SYHC
European	378	5	9
Māori	80	2	3
Pacific Peoples	38	1	1
Other	71	1	1
Unknown	28	2	0
<b>Total</b>	<b>595</b>	<b>11</b>	<b>14</b>

### Trends in age and ethnicity

Between 2006 and 2011, the distribution of NSU cases by age in SHCs has remained generally stable (Figure 60). From 2010 to 2011, case numbers decreased in every age group except in the 25 to 29 years age group, in which case numbers increased (142 to 152 cases). Case numbers remained lowest in the under 15 years and 15 to 19 years age groups.

**Figure 60: Number of NSU cases in SHCs in males by age-group, 2006-2011**

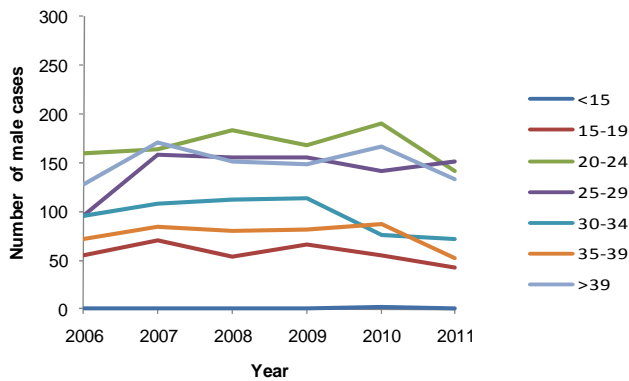
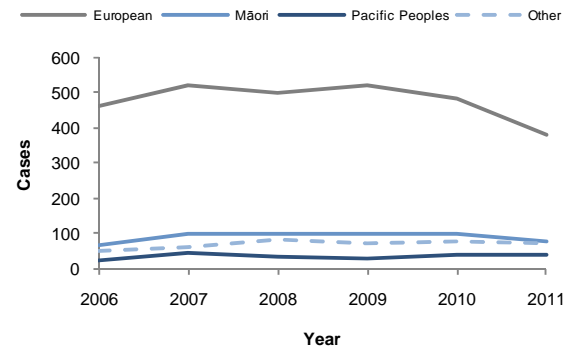


Figure 61 presents NSU case numbers reported from SHCs by ethnicity between 2006 and 2011. Since 2006, case numbers in the European ethnic group have decreased (461 cases to 378 cases), but case numbers have increased in all other ethnic groups. The largest relative increase was seen in Pacific Peoples (58%, 24 to 38 cases), followed by Other (45%, 49 to 71 cases) and Māori (23%, 65 to 80 cases) ethnic groups.

**Figure 61: Number of NSU cases reported from SHCs, by ethnicity, 2008-2011**





## DISCUSSION





## DISCUSSION

### Chlamydia

Chlamydia was the most commonly reported STI in New Zealand in 2011. Since 2008 the laboratory-based estimated national chlamydia rate has remained stable. However, over the last four years SHCs case numbers have increased and decreased in FPCs. This contrast in trends between different clinic types demonstrates the importance of the laboratory surveillance for understanding the actual trend in chlamydia detection in New Zealand. As laboratory data provide the most comprehensive set of chlamydia-positive results from a range of health care providers, including GPs, it is more likely than clinic-based surveillance to reflect actual trends, though limitations to this system are still present.

It is difficult to determine at this stage whether the Chlamydia Management Guidelines, released by the Ministry of Health in mid-2008, are contributing to the trend in laboratory chlamydia diagnoses [10]. These guidelines include recommendations for opportunistic testing for chlamydia in at-risk groups. At present, only the total numbers of tests are reported for routine laboratory surveillance data. Additional demographic data (e.g., age and sex) for patients tested will be required to monitor implementation of the guidelines. The current system is also unable to account for repeat testing in individuals. In Waikato there are higher rates of repeat testing among young females compared with other groups, overestimating the coverage of testing in this group [11].

There is an association between the introduction of the Chlamydia Management Guidelines and the site of specimens testing positive for chlamydia. Since 2008 there has been a decrease in the number of positive urethral swabs in both males and females and an increase in positive vaginal swabs in females. The guidelines recommend a vaginal swab for asymptomatic women, unless undergoing a speculum exam, and first catch urine for asymptomatic men.

### Gonorrhoea

Analysis of the laboratory data indicates a decrease in gonorrhoea rates nationally over the last four years (based on 15 DHBs). However, trends for individual DHBs show considerable variation across the country with some regions showing an increase and others a decrease over the last four years. Tairāwhiti DHB stood out with a laboratory-based gonorrhoea rate that is over 5-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 regional variation (such as testing patterns and clinic access) based on the available surveillance data. However, the data may identify areas where further investigation is warranted.

### Genital warts

There was a decreasing trend in the number of cases of genital warts in all clinic types between 2008 and 2011. This decrease was most notable in females aged 15 to 19 years, corresponding to the HPV immunisation programme introduced in 2008 targeting that population [12]. This supports the findings of ecological studies in Auckland and Australia, which observed a decline in the proportion of new clinic patients diagnosed with genital warts in populations targeted by immunisation programmes [13, 14]. Investigation to quantify the effectiveness of the vaccination programme in New Zealand, comparing genital warts rates in vaccinated and unvaccinated populations, would provide additional evidence to support the observed trend.

### At-risk groups

As in previous years, those aged less than 25 years showed a disproportionate burden of STIs in 2011. The highest numbers and rates for each STI were consistently in the 15 to 19 years and 20 to 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 105 chlamydia cases and two gonorrhoea cases aged less than 1 year in 2011. These neonatal infections highlight the need to improve STI screening during pregnancy. The Chlamydia Management Guidelines recommend that all pregnant women are tested during their first trimester and that testing is repeated in the third trimester if there are ongoing risk factors [10]. The New Zealand College of Midwives has also made a consensus statement that promotes discussion between midwives and women on the risks of STIs during pregnancy and the offer of screening for STIs [15].

## International comparisons

Several factors affect the ability to compare New Zealand data with incidence rates reported in other countries.

- The collection methods for STI surveillance data vary widely among countries, and are influenced by local STI screening practices.
- The New Zealand incidence rates are based on data from many but not all of the laboratories in New Zealand.
- The incidence rates vary geographically within New Zealand and may not be representative of the overall New Zealand rate.

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

The estimated national chlamydia rate for New Zealand in 2011 (786 per 100 000 population) was approximately two- to three-times higher than the national chlamydia rates most recently published for Australia (319 per 100 000 population in 2010), the United Kingdom (349 per 100 000 population in 2010) and the United States (426 per 100 000 population in 2009). For gonorrhoea, the estimated national rate for New Zealand in 2011 (67 per 100 000 population) was higher than the national rates observed in Australia (44 per 100 000 population in 2010) and the United Kingdom (30 per 100 000 population in 2010), but just two-thirds of the 2009 United States rate (101 per 100 000 population) [16-18].

## Emerging/re-emerging STIs

Trends in syphilis case numbers are important because they are a marker for behaviours associated with HIV transmission. In addition, syphilitic lesions make it easier to transmit and acquire HIV infection [15]. It appears that syphilis cases peaked in 2008, for the following two years there has been a steady decrease. However cases numbers in 2011 were still 37% higher than in 2006, with cases detected predominantly in Auckland and Wellington.

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

## Limitations of current surveillance system

This is the third year that population-based rates of chlamydia and gonorrhoea have been reported for New Zealand and by DHB. This is a considerable improvement on previous STI reporting. However, the New Zealand rate remains an estimate because the laboratory dataset is not yet complete. DHB reporting is still not possible for five DHBs for chlamydia and three DHBs for gonorrhoea.

As STIs are not notifiable, the STI surveillance system relies on the voluntary involvement of SHCs, FPCs, SYHCs and diagnostic laboratories. Although making it a legal requirement for laboratories to notify certain STIs would assist with surveillance, laboratory notification alone would not supply the more comprehensive data required for effective monitoring and public health action, such as the ethnicity of cases and other risk factors and behaviours, as well as information on negative and not just positive tests. In countries where STIs are notifiable, complementary surveillance systems have been established to provide additional information. Development activities being undertaken by ESR in 2012 will focus on improved identification and description of the burden of disease in population groups that are most affected; describing testing patterns and changes over time; and reporting surveillance information in a more user friendly way.

## Summary

The STI burden in New Zealand is considerable with young people and those of non-European ethnicities over-represented amongst bacterial STI cases. The laboratory surveillance data identified considerable variation in chlamydia and gonorrhoea detection by region. In particular, Tairāwhiti, Hawke's Bay and Lakes DHBs stand out as regions with higher rates of chlamydia and gonorrhoea. Finally, there may be early signs of a positive effect of the HPV immunisation programme with a decline in genital wart cases, although a direct relationship cannot be confirmed from the existing data.

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## REFERENCES

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## APPENDICES





## Appendix A: STI surveillance in New Zealand

### Purpose of STI surveillance

Surveillance is the ongoing 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

Sexual health clinics 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 (1<sup>st</sup> attack); herpes (1<sup>st</sup> attack); trichomonas; chancroid; lymphogranuloma venereum (LGV); and granuloma inguinale (GI). Clinics 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, have 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 site of infection and 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.

### 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 (BOP) 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.

### New initiatives in 2012

In 2011, a programme of work began at ESR to make improvements to the STI surveillance system. 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. The new format of this annual report, along with an updated format to the quarterly laboratory and clinic reports, are the immediate changes that have resulted.

During 2012 ESR will be working with clinics and laboratories on measures to enhance the surveillance of STIs. With laboratories, we plan to work to identify a means of collecting ethnicity information, important particularly to document and monitor the higher burden of STIs indicated in Māori and Pacific populations, and ideally also extend this to all specimens tested, enabling testing and positivity rates in different groups to be compared. Historically clinic surveillance had been used as an indicator of chlamydia and gonorrhoea incidence. With increasing laboratory participation

nationwide that function in no longer as critical, but clinics can provide valuable information such as sex of partner to enhance knowledge about STIs in men who have sex with men, another group with a higher burden of disease. Family Planning Clinics are exploring their ability to provide the reason that tests are undertaken. Concurrently at ESR we are updating our information management processes to make them more robust and able to accommodate additional requirements.

## Appendix B: Methods

All results and analyses are based on data submitted prior to 27 March 2012. Any data submitted after this date are not included in this report due to time constraints, but will be entered and contribute to 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 onto 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 of their cases and the total number of clinic visits either directly to ESR or to a regional co-ordinator. Data are 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 are sent electronically to ESR each month where they are 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 35.

**Table 35: STIs under clinic-based surveillance**

Infection	Category or criteria	Site (for confirmed infections)
Chlamydia	Confirmed or probable (1 <sup>st</sup> diagnosis per month)	Uncomplicated lower anogenital, PID/epididymitis, other site
Gonorrhoea	Confirmed or probable (1 <sup>st</sup> diagnosis per month)	Uncomplicated urogenital or anorectal, PID/epididymitis, pharynx, other site
Genital warts	1 <sup>st</sup> diagnosis at reporting clinic	
Genital herpes	1 <sup>st</sup> 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 clinic based rates were calculated using the total number of clinic visits as the denominator. This practice has now stopped following feedback from stakeholders.

### 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 estimates 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 2011 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 (2008–2011) was reported for laboratory surveillance trends, except for the DHB analyses where a five-year period (2007–2011) was reported and for the three-region analyses where a 14-year period (1998–2011) was reported. A six-year period (2006–2011) was reported for clinic surveillance trends.

### 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. Annual analysis 2011, including estimated national rate: Each laboratory in the DHB must have provided data for the 12 months of 2011.
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

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 and Coast DHBs (Aotea Pathology).

Table 36 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 36: Selected/excluded DHBs by analysis type and STI

District Health Board	Annual analysis 2011		National rate trend analysis		Individual DHB trend analysis	
	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea	Chlamydia	Gonorrhoea
Northland	✓	✓	✓	✓	✓	✓
Auckland region <sup>a</sup>	✓	✓	✓	✓	✓	✓
Waikato	✓	✓	✓	✓	✓	✓
Lakes	✓	✓	✓	✓	✓	✓
Bay of Plenty	✓	✓	✓	✓	✓	✓
Tairāwhiti	✓	✓	x	✓	✓ <sup>1</sup>	✓
Taranaki	✓	✓	✓	✓	✓	✓
Hawke's Bay	✓	✓	✓	✓	✓	✓
Whanganui	✓	✓	x	x	✓ <sup>2</sup>	✓ <sup>2</sup>
MidCentral	✓	✓	✓	✓	✓	✓
Wellington region <sup>b</sup>	x	✓	x	✓	x	✓
Wairarapa	✓	✓	x	x	✓ <sup>2</sup>	✓ <sup>2</sup>
Nelson Marlborough	x	x	x	x	x	x
West Coast	✓	✓	✓	✓	✓	✓
Canterbury	x	x	x	x	x	x
South Canterbury	x	x	x	x	x	x
Southern	✓	✓	✓	✓	✓	✓

<sup>a</sup> Waitemata, Auckland and Counties Manukau DHBs

<sup>b</sup> Hutt Valley and Capital & Coast DHBs

✓ = Selected      x = Excluded

<sup>1</sup> 2007, 2009-2011 only      <sup>2</sup> 2009-2011 only

## Appendix C: Laboratory and clinic participation and data completeness

### Clinics

In 2011, 27 SHCs, 32 FPCs, and 14 SYHCs across New Zealand voluntarily participated in the STI surveillance programme. All clinics provided complete data to ESR for at least 10 out of the 12 months (the required number of months to be included in the analysis). FPCs and SYHCs included some clinics based in schools or tertiary institutions that may have been closed during holiday periods.

### Laboratories

In 2010, 40 laboratories across 18 DHBs in New Zealand voluntarily participated in the STI surveillance programme. Of these, 39 laboratories provided chlamydia data and 39 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 81 928 clinic visits during 2011, 60.6% (49 653 visits) of which were by females. Between 2010 and 2011, the number of clinic visits decreased by 1.5% (from 84 373 visits in 2010 to 81 928 visits in 2011).

Where information about age and ethnicity was provided, 48.2% (39 386 visits) were by attendees aged less than 25 years, 61.8% (49 557 visits) were European, 23.6% (18 957 visits) were Māori, 4.7% (3 800 visits) were Pacific Peoples and 9.8% (7 861 visits) were of Other ethnicity.

### Family planning clinics

FPCs reported 180 671 clinic visits during 2011, 95.8% (173 045 visits) of which were by females. Between 2010 and 2011, the number of clinic visits decreased by 2.9% (from 183 371 visits in 2010 to 180 671 visits in 2011).

Where age and ethnicity information was provided, 61.7% (111 370 visits) were by attendees aged less than 25 years, 70.8% (120 132 visits) were European, 16.2% (27 449 visits) were Māori, 4.9% (8 334 visits) were Pacific Peoples and 8.1% (13 735 visits) were of Other ethnicity.

### Student and youth health clinics

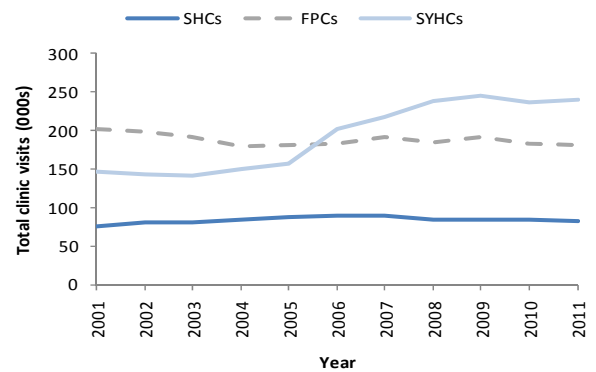
SYHCs reported 240 010 clinic visits during 2011, 69.2% (166 049 visits) of which were by females. Between 2010 and 2011, the number of clinic visits increased by 1.4% (from 236 691 visits in 2010 to 240 010 visits in 2011).

Where age and ethnicity information was provided, 74.9% (117 942 visits) were by attendees aged less than 25 years, 57.3% (89 351 visits) were European, 11.8% (18 390 visits) were Māori, 3.3% (5 170 visits) were Pacific Peoples and 27.6% (43 030 visits) were of Other ethnicity.

### Trends in clinic visits

Over the ten year period between 2001 and 2011 there was stability in the number of clinic visits annually to SHCs and FPCs (Figure 62). There was a marked increase in SYHC visits in 2006, which corresponds to both Victoria and Otago University clinics joining the surveillance programme. Visits to SYHC may be for any health reason, not only reproductive health.

Figure 62: Total clinic visits by clinic type, 2001-2011



## Appendix E: Interpreting the results

### Reporting of specimens and diagnostic tests

The diagnostic tests used for gonorrhoea are not standardised, with some laboratories using nucleic acid amplification and others using culture, though this is becoming less common. These tests have different sensitivities and specificities that may influence the data. Nucleic acid amplification testing has become the standard method for testing for chlamydia, but changes in testing methods over time may influence long term trends.

### Generalisability

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 they rely on other health care providers. University and polytechnic student health clinics provide services only to those students and staff who attend their institution.

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. Data presented for SYHCs in New Zealand may not be representative of all SYHCs, because not all provide STI surveillance data.

### Comparison with previous years

From 2006 to 2011, the number of clinic data sources has been relatively stable. However, the participating clinics are not always able to provide data for all of the months of the year. Clinic data for 2006 to 2010 are included if a clinic met the 10 out of 12 month inclusion criteria for 2011; the completeness of a clinic's data over the previous four 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 reported 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 for 2008 to 2011 were calculated using a restricted set of DHBs who had complete data for all four years. Therefore, year-on-year comparisons using the laboratory data are also valid.



## Appendix F: STI surveillance case definitions

Chlamydia	Confirmed	Laboratory detection of <i>Chlamydia trachomatis</i> in a clinical specimen. Cases should be classified as: <ol style="list-style-type: none"> <li>1. uncomplicated infection of the lower anogenital tract – this includes urogenital and anorectal infection</li> <li>2. pelvic inflammatory disease or epididymitis</li> <li>3. infection of another site (e.g., eye or pharynx).</li> </ol>
	Probable	Cases must be <u>all</u> of the following: <ul style="list-style-type: none"> <li>• symptomatic <b>and</b></li> <li>• a contact of a confirmed case <b>and</b></li> <li>• non-laboratory confirmed (test negative or test not done).</li> </ul>
Gonorrhoea	Confirmed	Laboratory isolation of <i>Neisseria gonorrhoeae</i> from a clinical specimen. Cases should be classified as: <ol style="list-style-type: none"> <li>1. uncomplicated infection of one or both of the following: <ol style="list-style-type: none"> <li>a. urogenital tract</li> <li>b. anorectal area (proctitis)</li> </ol> </li> <li>2. pelvic inflammatory disease or epididymitis</li> <li>3. extra-genital infection of one or both of the following: <ol style="list-style-type: none"> <li>a. pharynx</li> <li>b. other site not listed</li> </ol> </li> </ol>
	Probable	Cases must be <u>all</u> of the following: <ul style="list-style-type: none"> <li>• symptomatic <b>and</b></li> <li>• a contact of a confirmed case <b>and</b></li> <li>• non-laboratory confirmed (test negative or test not done).</li> </ul>
Anogenital herpes	First diagnosis for the person at your clinic, with either <ol style="list-style-type: none"> <li>1. laboratory detection of herpes simplex virus from a clinical specimen</li> </ol> <b>or</b> <ol style="list-style-type: none"> <li>2. a clinically compatible illness in the lower anogenital and buttock area (syphilis should be considered as a cause of genital ulceration).</li> </ol>	
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 <i>Haemophilus ducreyi</i> 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 <b>or</b> 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 <i>Chlamydia trachomatis</i> serotype L <sub>1</sub> , L <sub>2</sub> or L <sub>3</sub> from a clinical specimen.
	Probable	A clinically compatible illness with complement fixation titre of > 64 and other causes of ulcerations excluded <b>or</b> A clinically compatible illness in a person who is a contact of a confirmed case.

## Appendix G: List of participating laboratories

In 2011 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
- TLab Gisborne, Tairāwhiti
- 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 (gonorrhoea only)
- Grey Hospital Laboratory, West Coast
- Canterbury Health Laboratories, Canterbury
- Christchurch Southern Community Laboratory, Canterbury
- Ashburton Southern Community Laboratory, 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, 2011

Figure 63: Laboratory surveillance coverage for chlamydia by DHB, 2011

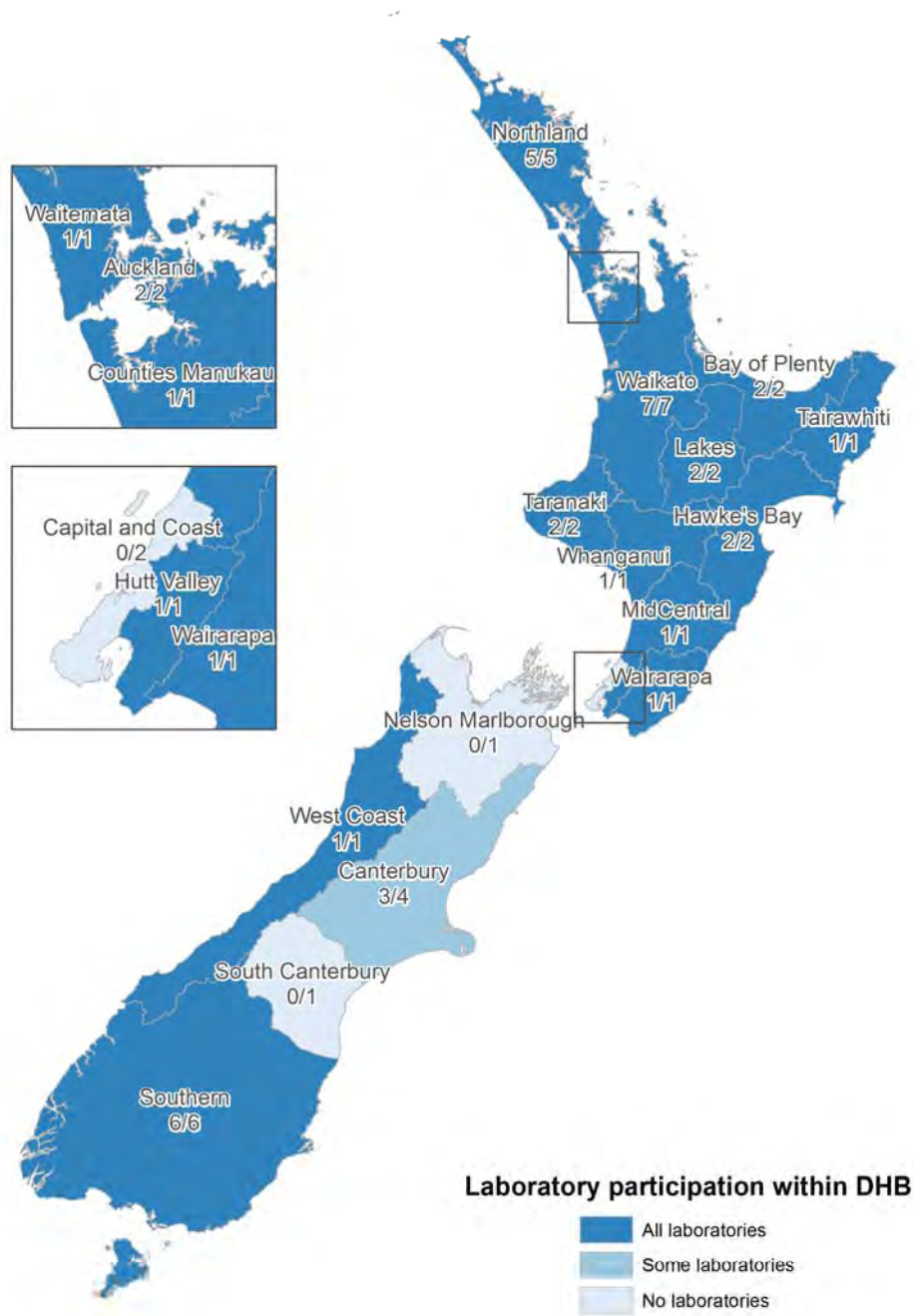


Figure 64: Laboratory surveillance coverage for gonorrhoea by DHB, 2011

