

# PERTUSSIS REPORT

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This report includes cases of pertussis reported in EpiSurv up to midnight 7 December 2012. Data were extracted from EpiSurv at 10.00 am 11 December 2012.

## Summary

In the past two surveillance weeks (24 November – 7 December 2012), 248 new cases of pertussis (113 and 135 cases, respectively) were notified, including 111 confirmed cases, 92 probable cases, 14 suspect cases, and 31 cases still under investigation. Fewer cases were reported in the past two surveillance weeks compared to the numbers reported over the previous two weeks (283 cases). Twenty-nine (11.7%) of the notified cases were aged less than 1 year. Fourteen cases were hospitalised.

There has been a total of 5493 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 1524 over the same period in 2011), including 2305 confirmed cases, 2810 probable cases, 274 suspect cases, and 104 cases still under investigation. 386 (7.0%) of the notified cases were in the less than 1 year age group. During this period, 288 hospitalisations and two deaths have been reported.

In the last two weeks, the highest number of cases (excluding cases under investigation) was reported in Canterbury (37 cases), Counties Manukau (20 cases), and Hutt Valley and Waikato (19 cases each) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (452.5 per 100 000, 633 cases), followed by West Coast (421.7 per 100 000, 139 cases) and Tairāwhiti (255.4 per 100 000, 119 cases) DHBs. During this same period the highest number of notifications was reported from Canterbury DHB (1150 cases), followed by Capital and Coast (646) and Nelson Marlborough (633), Counties Manukau (326) and Hutt Valley (325) DHBs. Monthly pertussis rates and cases (excluding cases under investigation) by DHB can be seen in Figures 8 and 9 (appendix).

This report summarises pertussis notifications for 2012 (first surveillance week starts on 31 December 2011) and new cases in the last two weeks, and incorporates the temporal distribution of cases, the distribution of cases by age, ethnicity (prioritised), and DHB, as well as hospitalisations and immunisation status. The case classification used in this report is specified in the appendix. Case definitions have changed following the release of the Ministry of Health's *Communicable Disease Control Manual 2012* on 31 May 2012.

## Temporal distribution of pertussis cases

Figure 1 shows weekly total pertussis notifications for 2010, 2011 and 2012 (to week ending 7 December). Notifications for the past two weeks of 2012 have dropped below 2011 levels but remain well above 2010 levels. Since week 34 in 2011 (ending 26 August) notifications have been increasing more or less consistently. The highest weekly notification count occurred during week 44 of this year. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition. Two deaths have been reported since the beginning of this year. Figure 5 (appendix) shows weekly pertussis notifications for confirmed, suspect and probable cases only for 2010, 2011 and 2012.

**Figure 1: Number of pertussis notifications by week reported 2010 - 2012**

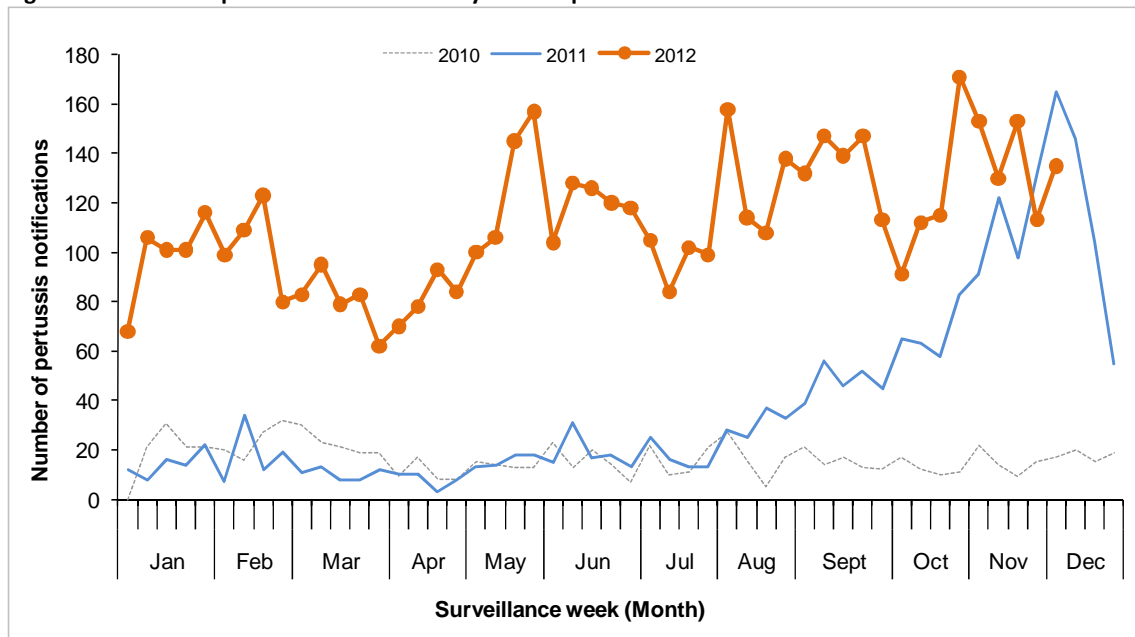
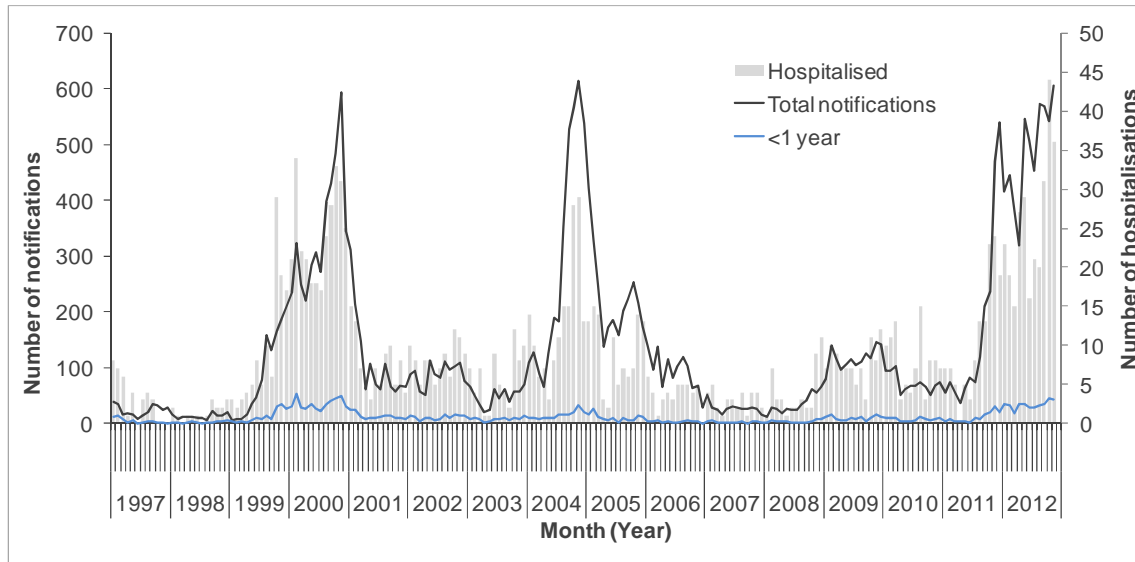


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 30 November 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, notifications have been rising again since August 2011. Increases in hospitalisations show a similar cycle, although peaks in hospitalisations do not always coincide with peaks in notifications. Figure 6 (appendix) shows annual rates in the less than 1 year age group over 1997-2011.

**Figure 2: Pertussis notifications and hospitalisations by calendar month-year since 1997 up to 30 November 2012**



In the following sections all analyses exclude cases still under investigation. Therefore, “cases” refer to those classified as confirmed, probable, or suspect.

### Age distribution of cases

Table 1 shows notifications and associated rates by age, including new cases for the last two weeks. Pertussis rates varied across age groups. Of the cases reported in 2012, infants aged less than one year had the highest cumulative notification rate (606.1 per 100 000 population, 378 cases), followed by the 1 to 4 years (331.9 per 100 000, 836 cases), and 5 to 9 years (239.5 per 100 000, 688 cases) age groups.

Of the 5389 cumulative cases with known age, 40 (0.7%) were infants under 6 weeks of age. Figure 3 shows the cumulative notification rate of pertussis cases by age group and ethnicity in 2012.

**Table 1: Pertussis cases and rates by age group in 2012, and new cases in the last two weeks**

Age group (Years)	Cumulative <sup>2</sup> notifications			Last two weeks <sup>3</sup>	
	All cases <sup>1</sup>	Rates <sup>1</sup>	Hosp	New Cases	Hosp
<1	378	606.1	167	24	10
1 to 4	836	331.9	27	18	1
5 to 9	688	239.5	9	21	0
10 to 14	498	170.0	5	16	0
15 to 19	253	79.7	6	7	0
20 to 29	482	77.9	4	30	0
30 to 39	622	110.5	11	23	1
40 to 49	692	109.6	13	32	0
50 to 59	439	79.0	17	23	0
60 to 69	308	73.8	13	12	0
70+	193	47.4	15	11	2
Unknown	0		0	0	0
<b>Overall</b>	<b>5389</b>	<b>122.3</b>	<b>287</b>	<b>217</b>	<b>14</b>

<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 24 November and 7 December 2012 inclusive

**Hosp:** hospitalisation counts

## Ethnicity

Pertussis cases and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European ethnic group had the highest numbers reported in the last two weeks (145 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (148.5 per 100 000, 4001 cases), followed by Māori (126.8 per 100 000, 717 cases) and Pacific Peoples (82.6 per 100 000, 187 cases). Figure 3 shows the European ethnic group having the highest notification rates across all age groups except the under 1 year age group. The ethnic distribution of cases in the under 1 year age group is also shown below. Māori had the highest notification rates in this age group, followed by Pacific Peoples.

**Table 2: Pertussis cases and rates by ethnicity (prioritised) in 2012, and new cases in the last two weeks**

Ethnicity	Cumulative <sup>2</sup> notifications					Last two weeks <sup>3</sup>		
	All cases (Rate <sup>1</sup> )	<1 year (Rate <sup>1</sup> )	Hosp (% <sup>4</sup> )	New Cases	<1 year	Hosp		
Māori	717 (126.8)	121 (862.4)	96 (13.4)	27	7	5		
Pacific Peoples	187 (82.6)	38 (742.0)	41 (21.9)	6	2	1		
Other	188 (50.2)	15 (285.6)	14 (7.4)	10	1	2		
European	4001 (148.5)	191 (643.0)	131 (3.3)	145	11	6		
Unknown	296	13	5	29	3	0		
<b>Overall</b>	<b>5389 (133.8)</b>	<b>378 (667.5)</b>	<b>287 (5.3)</b>	<b>217</b>	<b>24</b>	<b>14</b>		

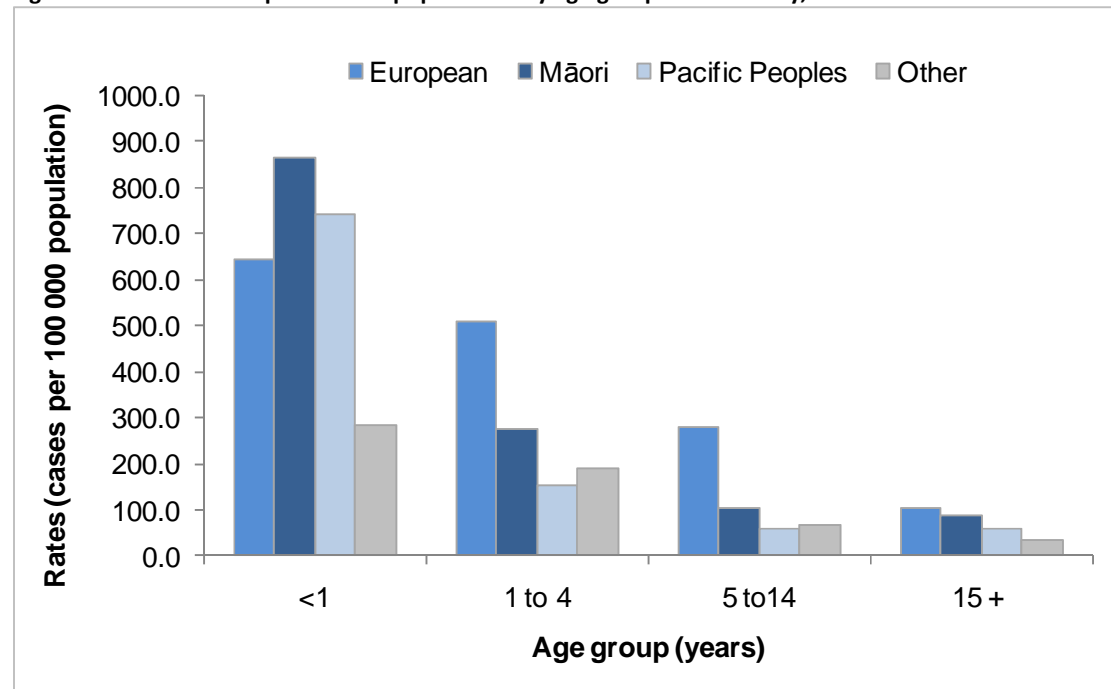
<sup>1</sup>Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 24 November and 7 December 2012 inclusive

<sup>4</sup>Percentage of hospitalised notifications by ethnic group

**Figure 3: Pertussis rates per 100 000 populations by age group and ethnicity, in 2012**



**Note:** Rate of pertussis cases per 100 000 population calculated using Census 2006 usually resident populations.

Figure 7 (appendix) shows the trend of cumulative pertussis notification rates (per 100 000 population) by age group and ethnicity for years 2003 to 2011. Over this time period rates have been generally highest among Pacific Peoples in the less than 1 year age group, while

in other age groups rates have been consistently highest in the European ethnic group. Note that these rates are for all notifications.

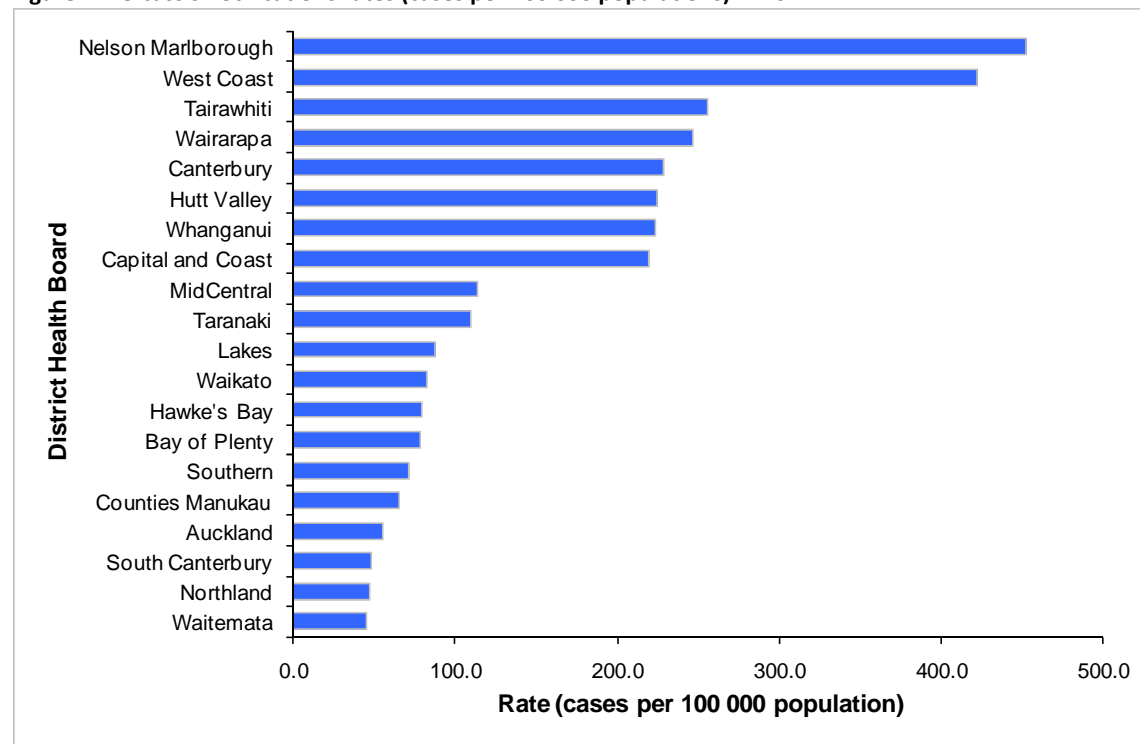
## Hospitalisations and Deaths

The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5, respectively. In the last two weeks, 14 hospitalisations were recorded. There have been 287 hospitalisations reported in EpiSurv in 2012. One hundred and sixty-seven (58.2%) of these were infants aged less than one year including 36 cases aged less than six weeks. Of the 4686 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (24.1%, 41/170), Māori (14.7%, 96/654), Other (8.1%, 14/172), and European (3.6%, 131/3690). There have been two pertussis deaths reported in 2012. One in a 3 year old unimmunised child with underlying health conditions, and one in an infant aged less than 6 weeks with a history of premature birth.

## Geographic distribution

The rates of pertussis notifications by DHB can be seen in Figure 4 and Table 5 (appendix). In the last two weeks, the highest number of cases was reported in Canterbury (37 cases), Counties Manukau (20 cases), and Hutt Valley and Waikato (19 cases each) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (452.5 per 100 000, 633 cases), followed by West Coast (421.7 per 100 000, 139 cases) and Tairāwhiti (255.4 per 100 000, 119 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (1150 cases), followed by Capital and Coast (646), Nelson Marlborough (633), Counties Manukau (326) and Hutt Valley (325) DHBs. Cases in the under 1 year age group by DHB are shown in Table 5 (appendix). Also, monthly pertussis rates and cases (excluding cases under investigation) by DHB can be seen in Figures 8 and 9 (appendix).

**Figure 4: Pertussis notifications rates (cases per 100 000 populations) in 2012**



**Note:** Rates were calculated using 2011 mid-year population estimates.

## Immunisation status

The immunisation status for confirmed pertussis cases with known age is shown in Table 3 and Table 4 for the last two weeks and for 2012, respectively. Of the 111 confirmed cases reported in the last two weeks, 65 (58.6%) had a known vaccination status. Of these 65 cases, 24 were not vaccinated. Nine cases had received one dose of vaccine, one case had received two doses, nine cases had received three doses, six cases had received four doses, and four reported having completed pertussis vaccination. A further 12 cases reported being vaccinated but no dose information was available.

**Table 3: Immunisation status of pertussis cases (confirmed) notified in the last two weeks (ending 23 November)**

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		
							(no dose info)	Not vaccinated	Unknown
<6wks	0	0	0	0	0	0	0	0	0
6wks - 2mths	10	4	0	0	0	0	0	4	2
3-4 mths	3	0	1	0	0	0	0	1	1
5mths - 3yrs	15	1	0	5	0	0	2	5	2
4 - 10yrs	26	1	0	3	6	2	4	3	7
11+ yrs	57	3	0	1	0	2	6	11	34
Unknown	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>111</b>	<b>9</b>	<b>1</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>12</b>	<b>24</b>	<b>46</b>

**Note:** Immunisation status has been extracted from Episurv notifications. Health professionals use a range of sources to update immunisation status including the NIR, parental recall or Well Child book records.

Of the 2305 confirmed cases with known age reported during 2012, 1513 (65.6%) had a known vaccination status (Table 4). Of these 1513 cases, 541 were not vaccinated, including 22 cases aged less than 6 weeks and thus not eligible for vaccination. One hundred and twenty-six cases had received one dose of vaccine, 39 cases had received two doses, 213 cases had received three doses, 198 cases had received four doses, and 116 cases reported having completed pertussis vaccination. A further 280 cases reported being vaccinated but no dose information was available.

**Table 4: Immunisation status of pertussis cases (confirmed) notified in 2012 (since 31 December 2011)**

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		
							(no dose info)	Not vaccinated	Unknown
<6wks	25	0	0	0	0	0	0	22	3
6wks - 2mths	87	47	1	0	0	0	3	30	6
3-4 mths	43	8	18	0	0	0	0	15	2
5mths - 3yrs	374	6	10	161	32	1	21	111	32
4 - 10yrs	572	10	4	37	144	75	79	161	62
11+ yrs	1204	55	6	15	22	40	177	202	687
Unknown	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>2305</b>	<b>126</b>	<b>39</b>	<b>213</b>	<b>198</b>	<b>116</b>	<b>280</b>	<b>541</b>	<b>792</b>

**Note:** Immunisation status has been extracted from Episurv notifications. Health professionals use a range of sources to update immunisation status including the NIR, parental recall or Well Child book records.

## Appendix

**Table 5: Pertussis cases and rates by DHB in 2012, and new cases in the last two weeks**

DHB	Cumulative <sup>2</sup> notifications				Last two weeks <sup>3</sup>		
	All cases	Rates <sup>1</sup>	<1 year*	Hosp	New Cases	<1 year*	Hosp
Northland	74	46.8	7	4	2	0	0
Waitemata	247	45.3	23	24	16	4	1
Auckland	252	55.2	20	26	5	0	0
Counties Manukau	326	65.2	50	62	20	6	6
Waikato	302	82.1	25	18	19	2	1
Lakes	90	87.4	13	11	1	0	0
Bay of Plenty	167	78.8	9	4	18	2	1
Tairāwhiti	119	255.4	14	4	0	0	0
Taranaki	120	109.2	6	8	4	1	1
Hawke's Bay	123	79.0	12	7	0	0	0
Whanganui	141	223.5	18	13	2	1	0
MidCentral	191	113.5	16	9	8	0	0
Hutt Valley	325	224.9	13	5	19	1	0
Capital and Coast	646	219.2	30	10	13	1	1
Wairarapa	100	246.4	6	11	16	0	0
Nelson Marlborough	633	452.5	36	9	15	1	1
West Coast	139	421.7	4	2	6	1	0
Canterbury	1150	228.8	52	37	37	3	2
South Canterbury	27	47.9	0	2	1	0	0
Southern	217	70.8	24	21	15	1	0
<b>Total</b>	<b>5389</b>	<b>122.3</b>	<b>378</b>	<b>287</b>	<b>217</b>	<b>24</b>	<b>14</b>

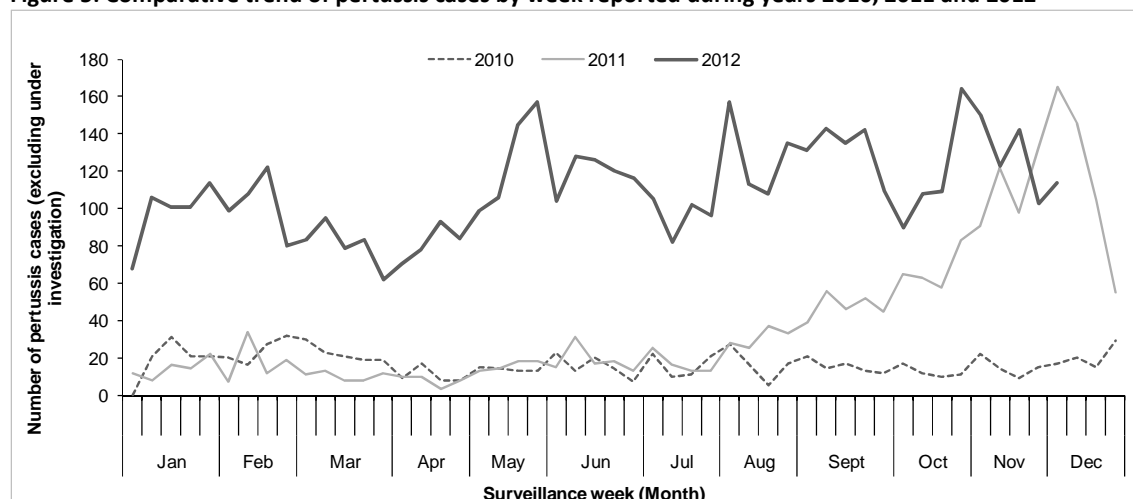
<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 24 November and 7 December 2012 inclusive

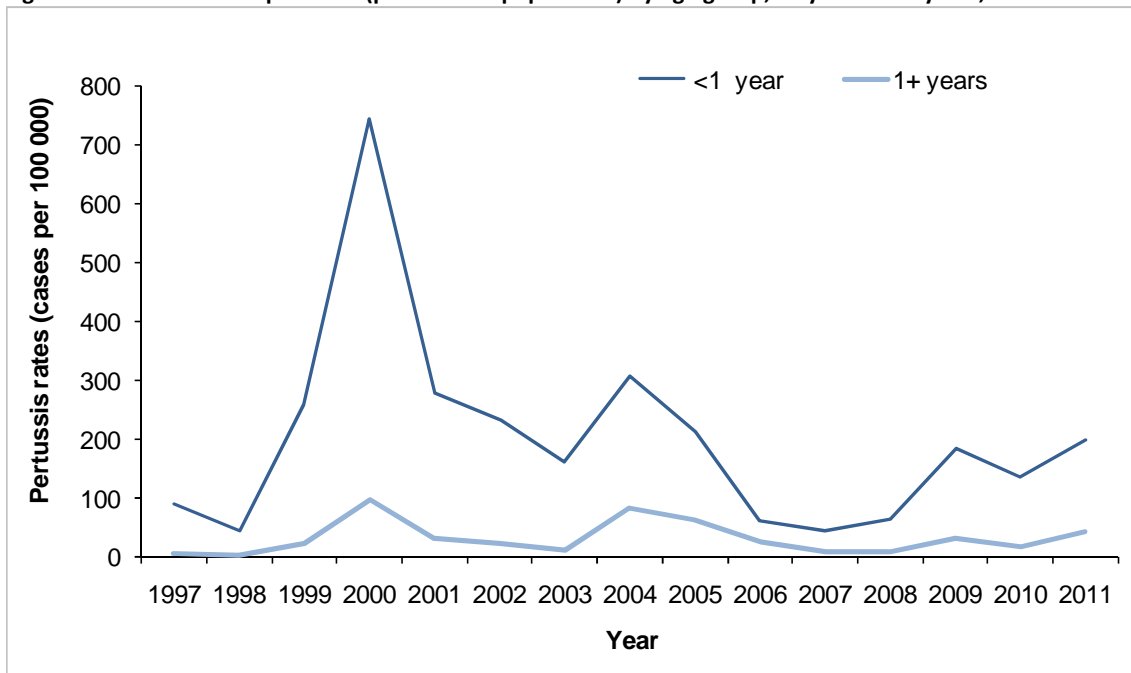
\*Cases in the less than 1 year age group

**Figure 5: Comparative trend of pertussis cases by week reported during years 2010, 2011 and 2012**



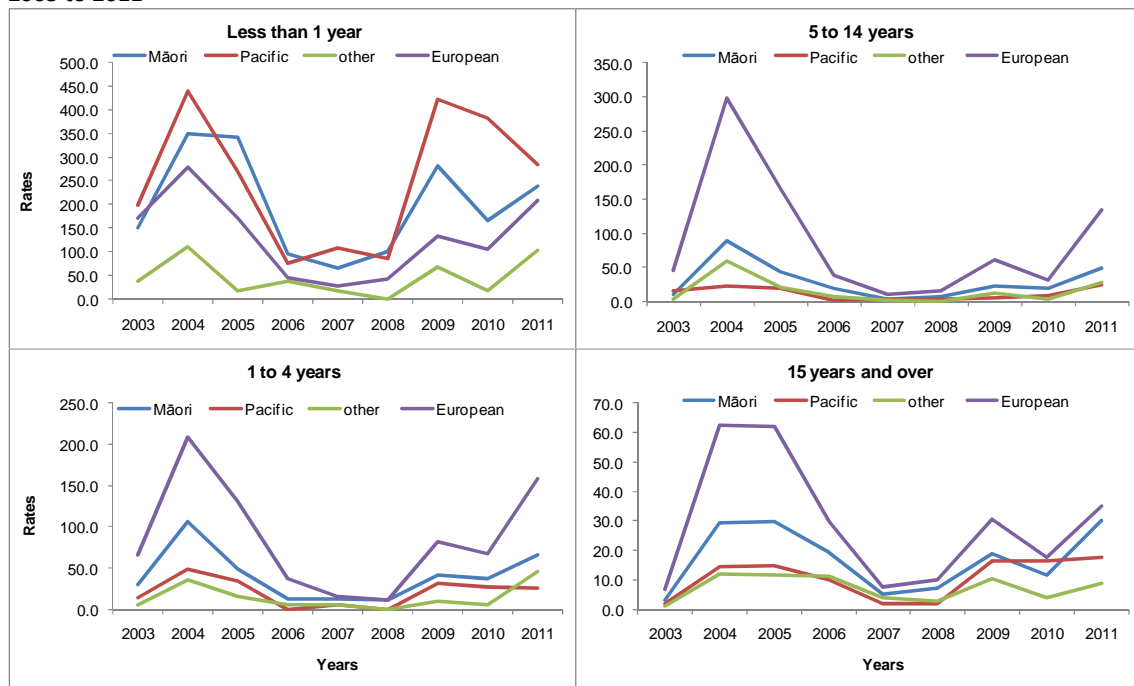
**Note:** Includes confirmed, probable and suspect cases only.

Figure 6: Annual rates of pertussis (per 100 000 population) by age group, <1 year vs. 1+ years, 1997-2011



Note: Rate of pertussis notified cases per 100 000 population calculated using mid-year population estimates.

Figure 7: Trends in cumulative pertussis rates (per 100 000 population) by age group and ethnicity, 2003 to 2011



Note: Rate of pertussis notified cases per 100 000 population (includes cases under investigation) calculated using mid-year population estimates



Figure 8: Monthly pertussis rates (cases per 100 000 population) by DHB, since January 2011

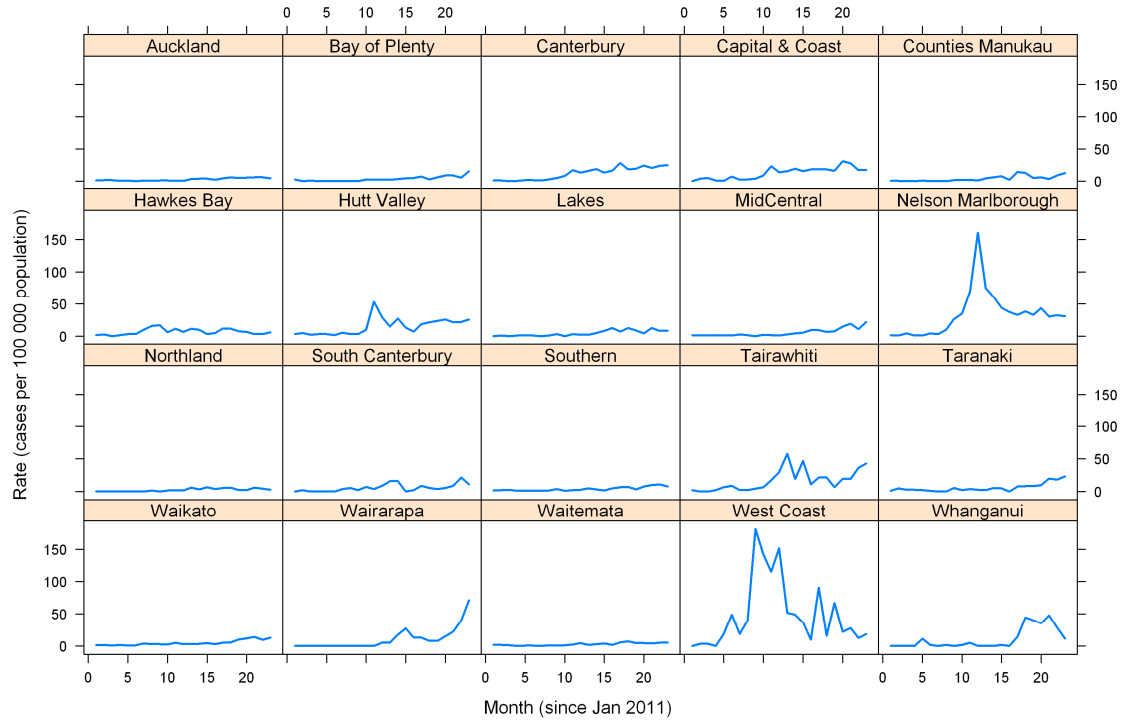
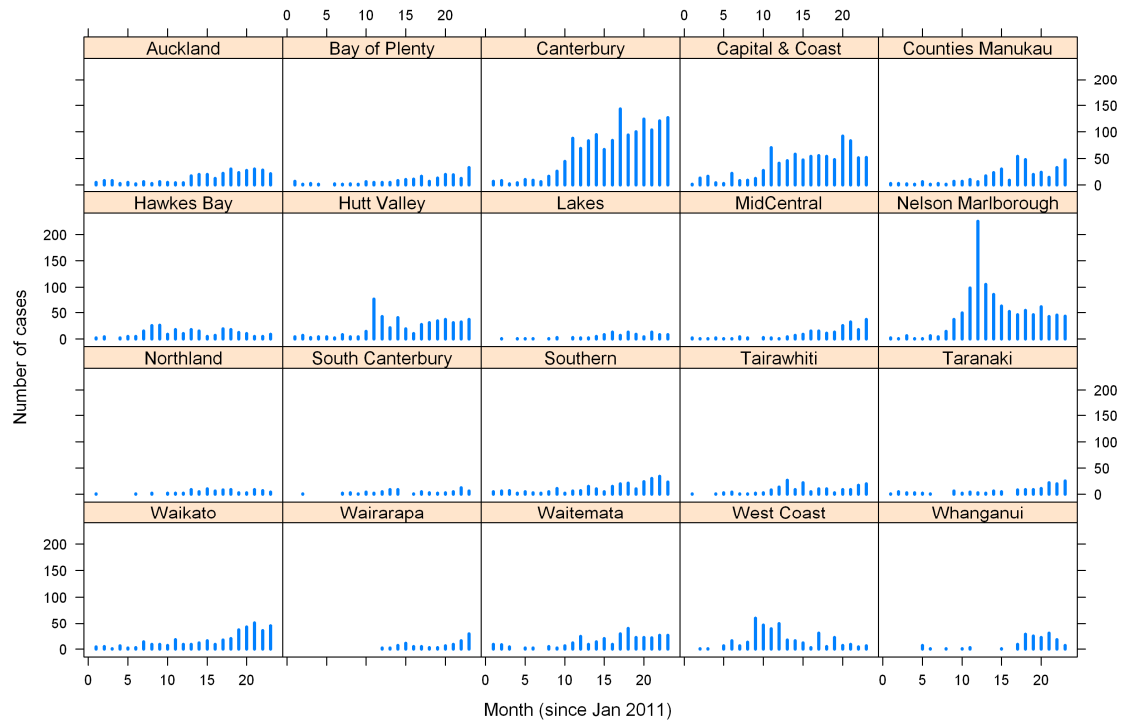


Figure 9: Monthly pertussis cases by DHB, since January 2011



Note: cases include confirmed, probable, and suspect only.

**Case classification for pertussis notification in New Zealand to 31 May 2012**

<b>Confirmed</b>	A clinically compatible illness that is laboratory confirmed by isolation of <i>Bordetella pertussis</i> from a pernasal swab, or epidemiologically linked to a confirmed case.
<b>Probable</b>	Cough lasting longer than two weeks and one or more of the following: <ul style="list-style-type: none"> <li>• Paroxysmal cough</li> <li>• Cough ending in vomiting or apnoea</li> <li>• Inspiratory whoop for which there is no other known cause.</li> </ul>
<b>Suspect</b>	In children under five years of age, any paroxysmal cough with whoop, vomiting or apnoea for which there is no other known cause.
<b>Other</b>	Status recorded as <i>under investigation</i> or suspect case.
<b>Notifications</b>	Include confirmed cases, probable, and other as specified above.

**Case classification for pertussis notification in New Zealand from 31 May 2012**

<b>Confirmed</b>	A clinically compatible illness that is laboratory confirmed by isolation of <i>B. pertussis</i> or detection of <i>B. pertussis</i> nucleic acid, preferably from a nasopharyngeal swab, or is epidemiologically linked to a confirmed case.
<b>Probable</b>	A clinically compatible illness with a high <i>B. pertussis</i> IgA test or a significant increase in antibody levels between paired sera at the same laboratory OR A cough lasting longer than two weeks and with one or more of the following, for which there is no other known cause: <ul style="list-style-type: none"> <li>• Paroxysmal cough</li> <li>• Cough ending in vomiting or apnoea</li> <li>• Inspiratory whoop</li> </ul>
<b>Suspect</b>	In children under five years of age any paroxysmal cough with whoop, vomiting or apnoea for which there is no other known cause.
<b>Under investigation</b>	A case that has been notified, but information is not yet available to classify it as suspect, probable or confirmed.
<b>Notifications</b>	Include confirmed cases, probable, suspect and under investigation as specified above.

This report will be available at: <http://www.surv.esr.cri.nz/surveillance/PertussisRpt.php>.