

# PERTUSSIS REPORT

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This report includes cases of pertussis reported in EpiSurv up to midnight 22 June 2012. Data were extracted from EpiSurv at 10.00 am 26 June 2012.

## Summary

In the past two surveillance weeks (9 June – 22 June 2012), 279 new cases of pertussis (140 and 139 cases, respectively) were notified, including 87 confirmed cases, 100 probable cases, 11 suspect cases, and 81 cases still under investigation. These numbers have increased compared to the numbers reported over the previous two weeks (266 cases). Twenty (7.2%) of the notified cases were aged less than 1 year. Ten cases were hospitalised.

There has been a total of 2536 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 353 over the same period in 2011), including 931 confirmed cases, 1388 probable cases, 80 suspect cases, and 137 cases still under investigation. 179 (7.1%) of the notified cases were in the less than 1 year age group. During this period, 122 hospitalisations and no deaths have been reported.

In the last two weeks, the highest number of cases (excluding cases under investigation) was reported in Canterbury (49 cases), Capital and Coast (24 cases), and Counties Manukau (20 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (266.6 per 100 000, 373 cases), followed by West Coast (242.7 per 100 000, 80 cases) and Tairāwhiti (141.6 per 100 000, 66 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (536 cases), followed by Nelson Marlborough (373 cases), Capital and Coast (296), Counties Manukau (167) and Hutt Valley (137) 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 22 June). Notifications for the past two weeks of 2012 remain well above 2011 and 2010 levels, although in 2011 they have been running above 2010 levels since week 34 (ending 26 August 2011) and have been rising more or less consistently. There was a decreasing trend in notifications through February and March 2012, although since the beginning of April there has been a general increase in weekly notifications. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition. No 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**

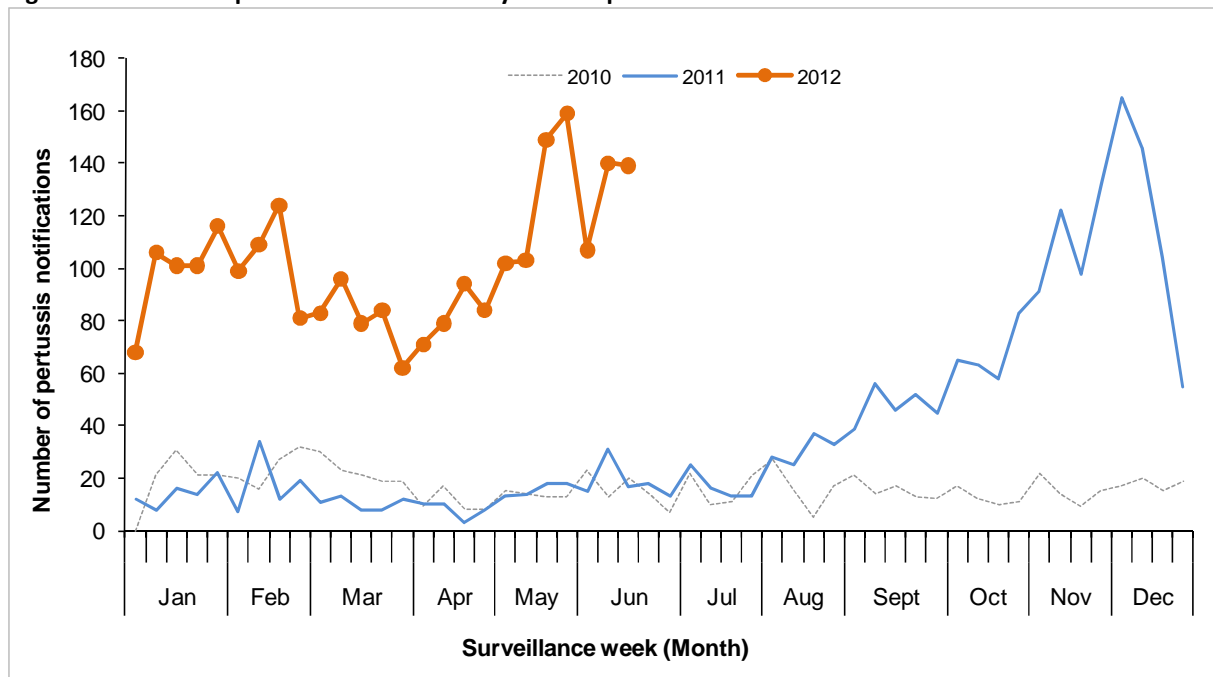
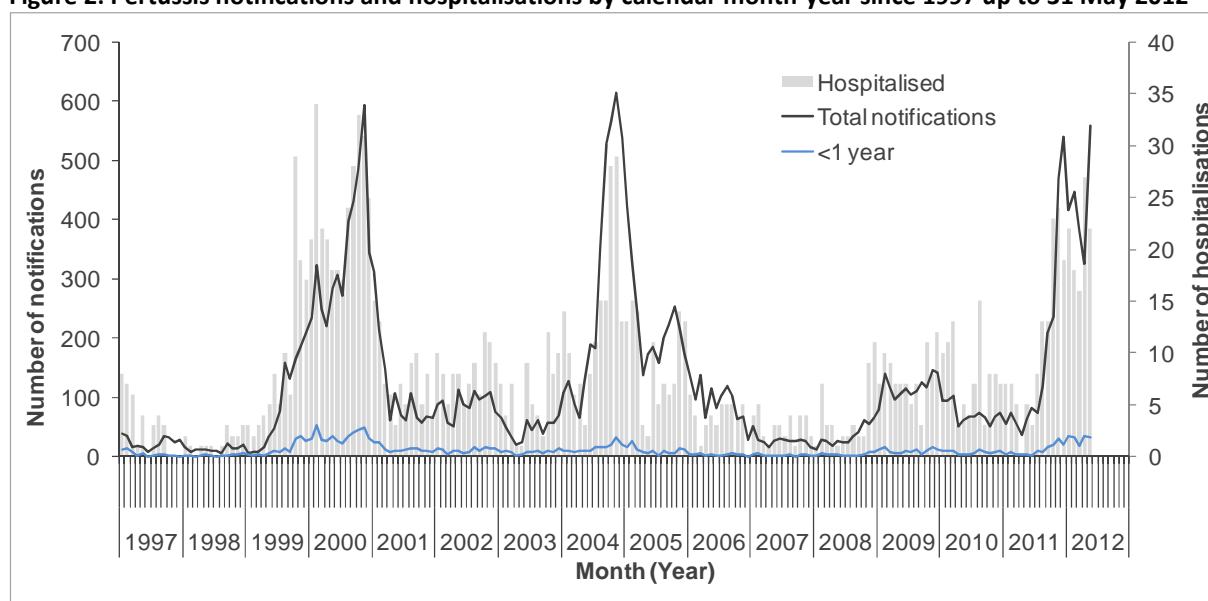


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 May 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, notifications have been rising again since May 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 31 May 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 incidence (271.0 per 100 000 population, 169 cases), followed by the 1 to 4 years (158.8 per 100 000, 400 cases), and 5 to 9 years (100.3 per 100 000, 288 cases) age groups.

Of the 2395 cumulative cases with known age, 20 (0.8%) were infants under 6 weeks of age. Figure 3 shows the cumulative incidence 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	169	271.0	73	13	5
1 to 4	400	158.8	7	31	0
5 to 9	288	100.3	4	22	0
10 to 14	213	72.7	2	26	0
15 to 19	124	39.1	4	13	0
20 to 29	216	34.9	2	19	0
30 to 39	263	46.7	5	21	0
40 to 49	302	47.8	6	20	1
50 to 59	199	35.8	10	13	2
60 to 69	132	31.6	4	13	0
70+	89	21.9	2	5	0
Unknown	4		0	2	0
<b>Overall</b>	<b>2399</b>	<b>54.5</b>	<b>119</b>	<b>198</b>	<b>8</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 9 June and 22 June 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 (126 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (66.2 per 100 000, 1782 cases), followed by Māori (52.9 per 100 000, 299 cases) and Pacific Peoples (40.2 per 100 000, 91 cases). Figure 3 shows the European ethnic group having the highest rates across all age groups except the under 1 year age group, followed by Māori. The ethnic distribution of cases in the under 1 year age group is also shown below. The Pacific Peoples ethnic group had the highest rates in this age group, followed by European.

**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 <sup>1</sup>	<1 year <sup>1</sup>	Hosp (% <sup>4</sup> )	New Cases	<1 year	Hosp
Māori	299 (52.9)	41 (292.2)	31 (10.4)	23	1	1
Pacific Peoples	91 (40.2)	23 (449.1)	25 (27.5)	6	2	2
Other	87 (23.2)	5 (95.2)	5 (5.7)	8	1	2
European	1782 (66.2)	90 (303.0)	53 (3.0)	126	5	3
Unknown	140	10	5	35	4	0
<b>Overall</b>	<b>2399</b>	<b>169</b>	<b>119</b>	<b>198</b>	<b>13</b>	<b>8</b>

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

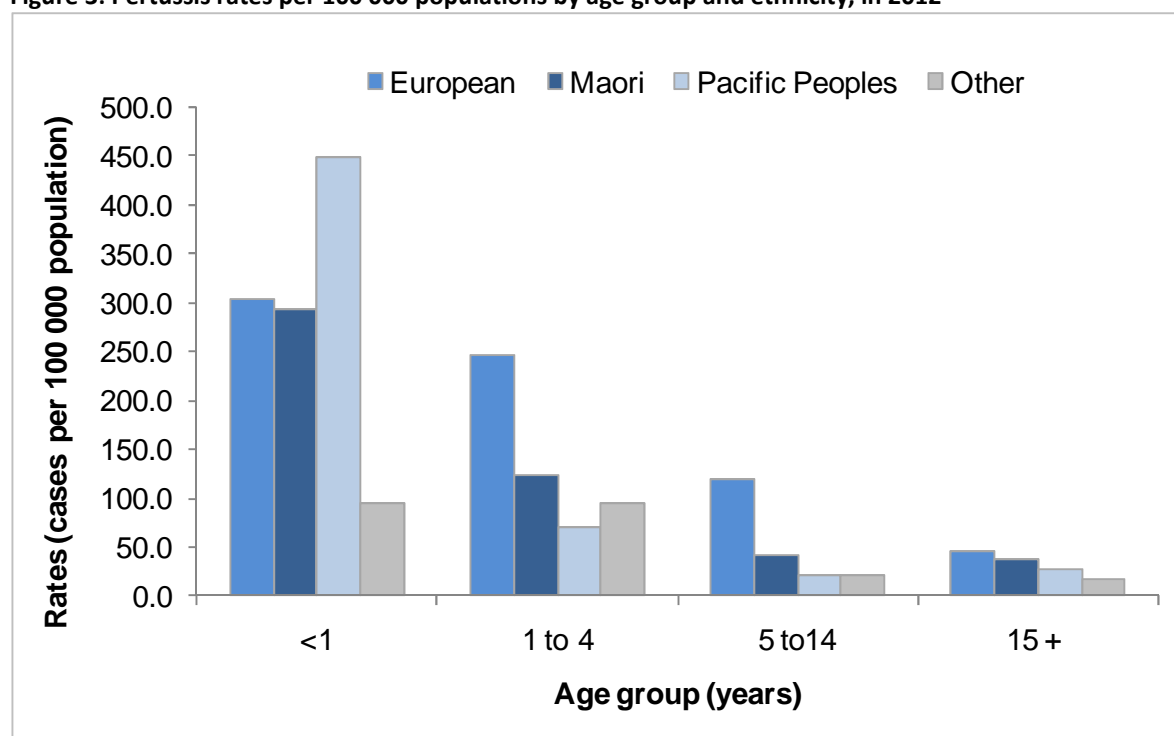
<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 9 June and 22 June 2012 inclusive

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

Rates calculated on fewer than five cases are unstable and should be interpreted with caution.

**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.

Rates calculated on fewer than five cases are unstable and should be interpreted with caution.

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.

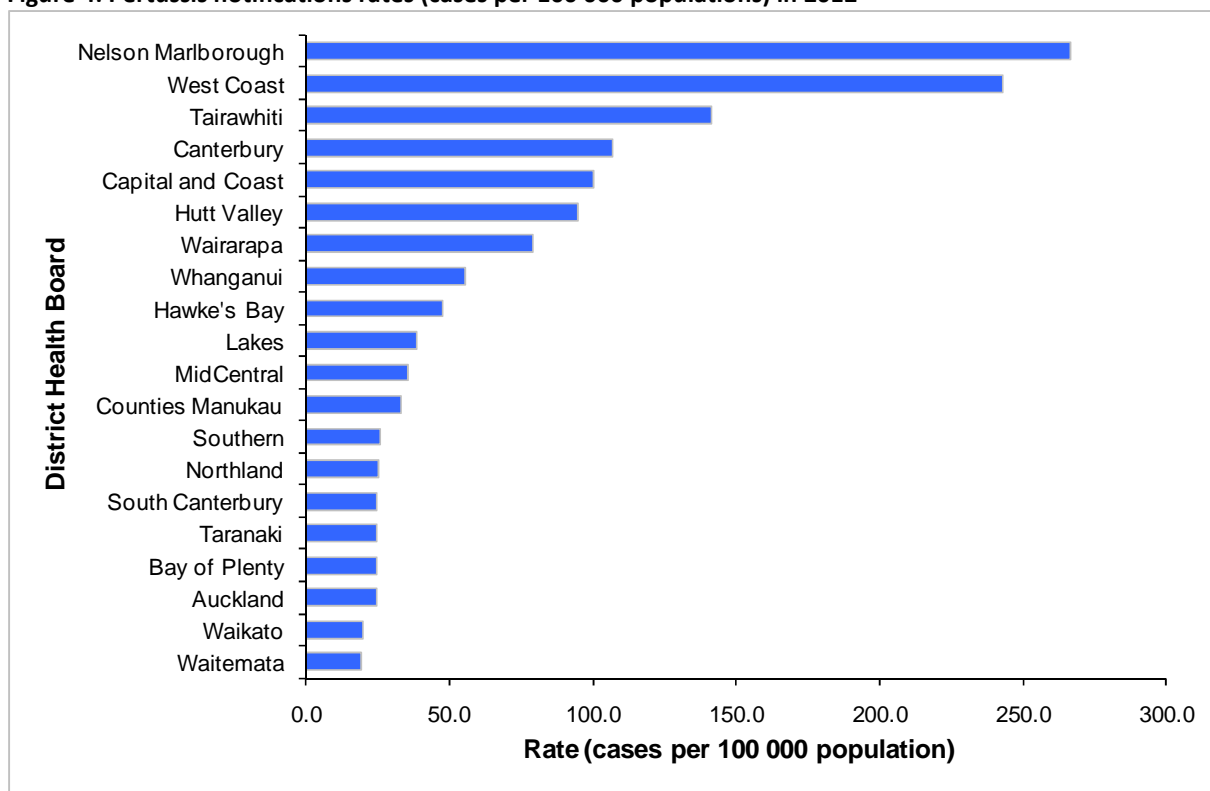
## Hospitalisations

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, eight hospitalisations were recorded. There have been 119 hospitalisations reported in EpiSurv in 2012. Seventy-three (61.3%) of these were infants aged less than one year including 20 cases aged less than six weeks. Of the 2065 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (29.1%, 25/86), Māori (11.2%, 31/276), Other (6.5%, 5/77), and European (3.3%, 53/1626).

## 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 (49 cases), Capital and Coast (24 cases), and Counties Manukau (20 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (266.6 per 100 000, 373 cases), followed by West Coast (242.7 per 100 000, 80 cases) and Tairāwhiti (141.6 per 100 000, 66 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (536 cases), followed by Nelson Marlborough (373 cases), Capital and Coast (296), Counties Manukau (167) and Hutt Valley (137) 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. Rates calculated on fewer than five cases are unstable and should be interpreted with caution (see Appendix for table).

## 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 87 confirmed cases reported in the last two weeks, 48 (55.2%) had a known vaccination status. Of these 48 cases, 15 were not vaccinated. Two cases had received one dose of vaccine, two cases had received two doses, five cases had received three doses, seven cases had received four doses, and eight cases reported having completed pertussis vaccination. A further nine 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 22 June)**

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	2	0	0	0	0	0	0	1	1
3-4 mths	2	0	2	0	0	0	0	0	0
5mths - 3yrs	13	1	0	3	2	0	2	0	5
4 - 10yrs	18	0	0	0	4	6	1	5	2
11+ yrs	52	1	0	2	1	2	6	9	31
Unknown	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>87</b>	<b>2</b>	<b>2</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>15</b>	<b>39</b>

**Note:** Immunisation status has been extracted from Episurv notifications and is based on parental recall or Well Child book records only.

Of the 931 confirmed cases with known age reported during 2012, 610 (65.5%) had a known vaccination status (Table 4). Of these 610 cases, 199 were not vaccinated, including 10 cases aged less than 6 weeks and thus not eligible for vaccination. Fifty-seven cases had received one dose of vaccine, 12 cases had received two doses, 92 cases had received three doses, 83 cases had received four doses, and 47 cases reported having completed pertussis vaccination. A further 120 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	11	0	0	0	0	0	0	10	1
6wks - 2mths	24	12	0	0	0	0	0	9	3
3-4 mths	17	3	6	0	0	0	1	7	0
5mths - 3yrs	171	3	4	69	20	0	15	39	21
4 - 10yrs	207	6	0	15	52	29	22	63	20
11+ yrs	501	33	2	8	11	18	82	71	276
Unknown	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>931</b>	<b>57</b>	<b>12</b>	<b>92</b>	<b>83</b>	<b>47</b>	<b>120</b>	<b>199</b>	<b>321</b>

**Note:** Immunisation status has been extracted from Episurv notifications and is based on parental recall or Well Child book records only.

## 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	40	25.3	4	2	1	0	0
Waitemata	106	19.4	10	12	17	3	0
Auckland	112	24.5	10	11	14	0	0
Counties Manukau	167	33.4	27	28	20	4	4
Waikato	73	19.9	4	4	9	0	0
Lakes	40	38.8	2	1	2	0	0
Bay of Plenty	52	24.5	2	2	3	0	0
Tairāwhiti	66	141.6	7	1	0	0	0
Taranaki	27	24.6	1	1	3	0	0
Hawke's Bay	74	47.5	7	5	2	1	1
Whanganui	35	55.5	6	5	11	2	1
MidCentral	60	35.6	5	4	8	0	2
Hutt Valley	137	94.8	8	3	10	0	0
Capital and Coast	296	100.5	17	4	24	1	0
Wairarapa	32	78.9	3	6	3	0	0
Nelson Marlborough	373	266.6	20	4	13	1	0
West Coast	80	242.7	2	1	0	0	0
Canterbury	536	106.6	21	14	49	1	0
South Canterbury	14	24.8	0	1	0	0	0
Southern	79	25.8	13	10	9	0	0
<b>Total</b>	<b>2399</b>	<b>54.5</b>	<b>169</b>	<b>119</b>	<b>198</b>	<b>13</b>	<b>8</b>

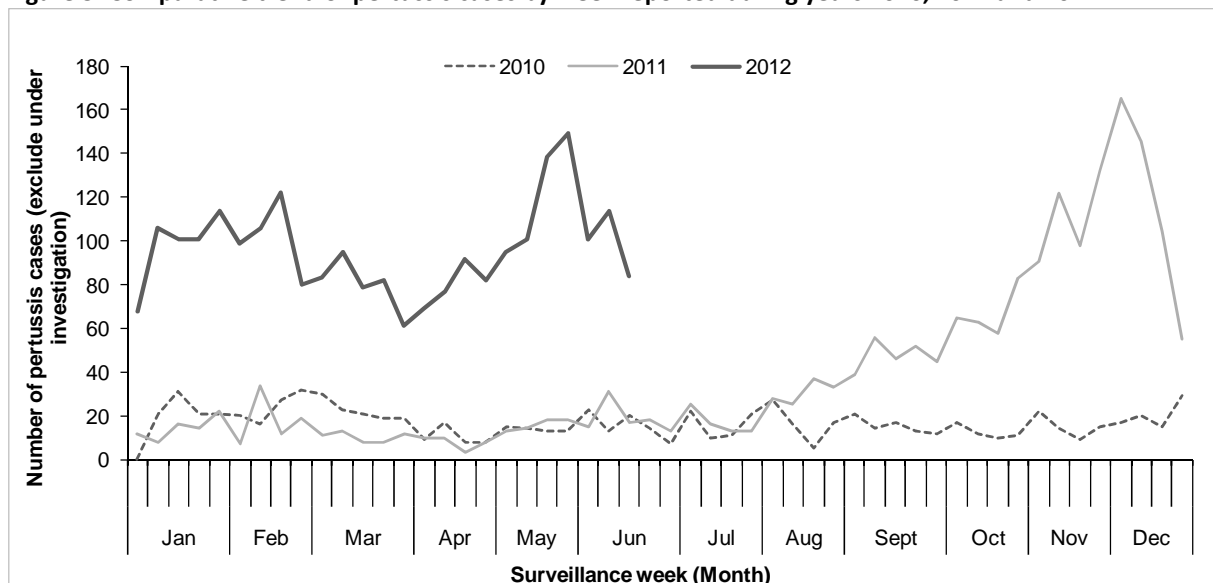
<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

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

<sup>3</sup>Notifications between 9 June and 22 June 2012 inclusive

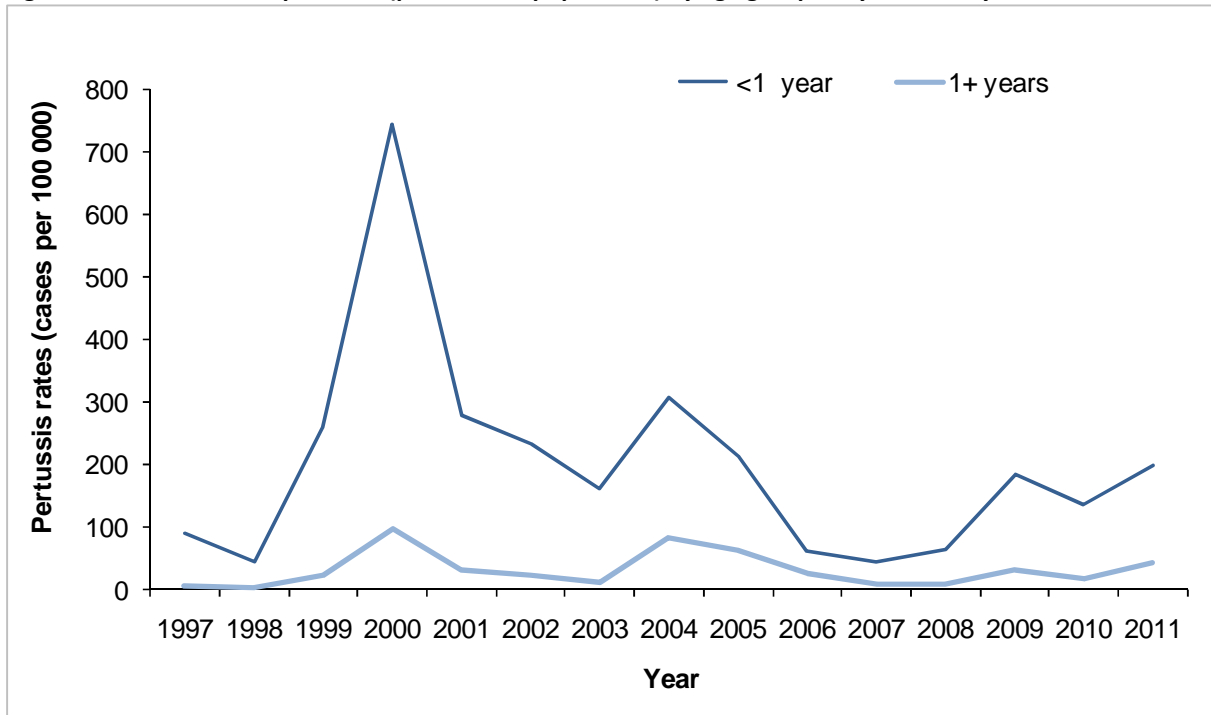
\*Cases in the less than 1 year age group

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



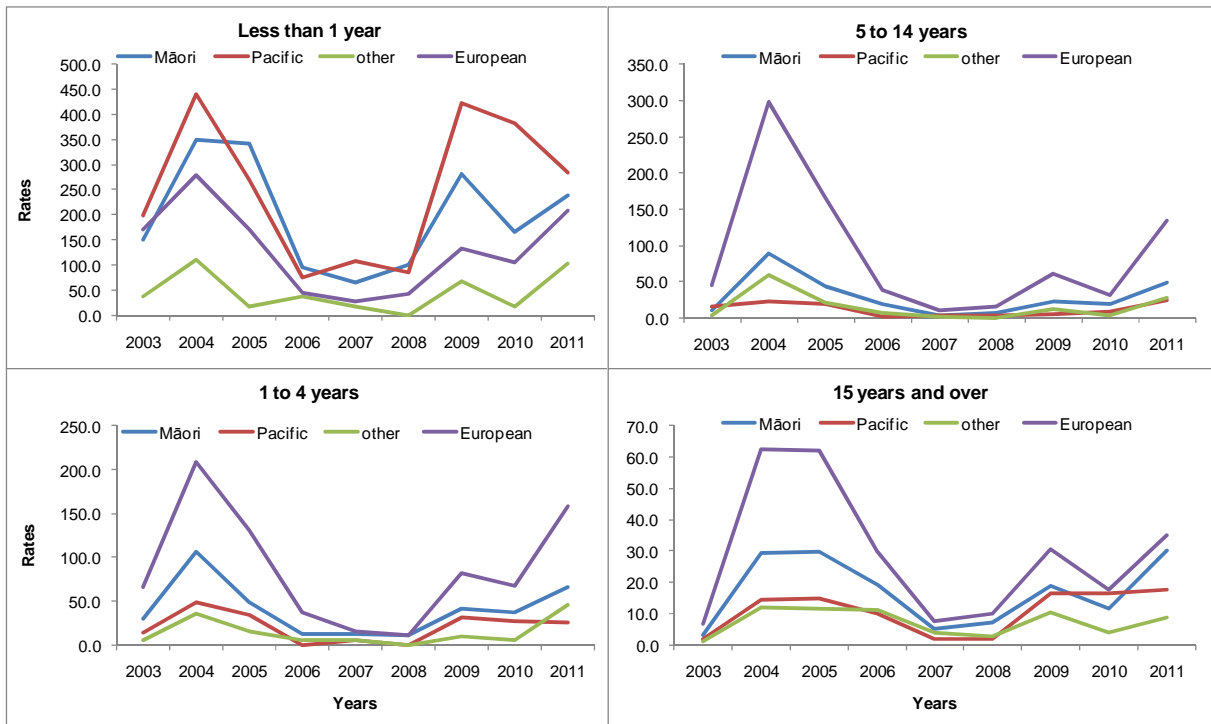
Note: Includes confirmed, probable and suspect cases only.

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

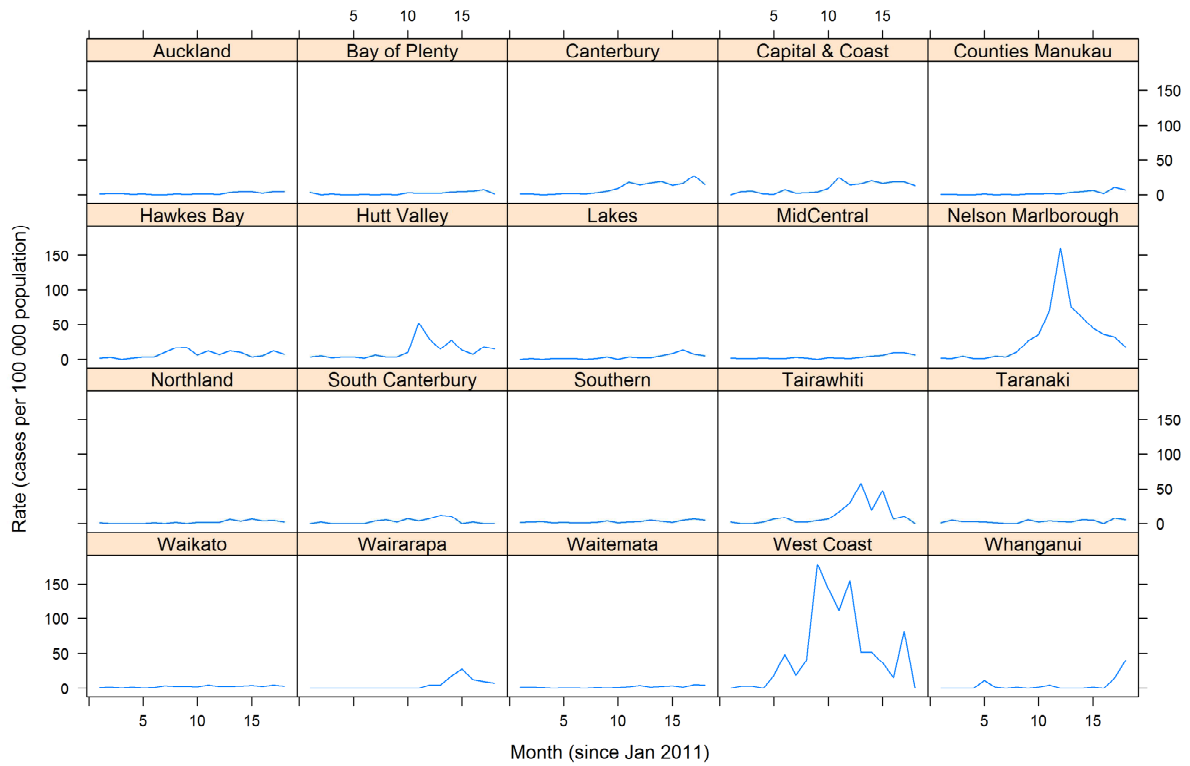
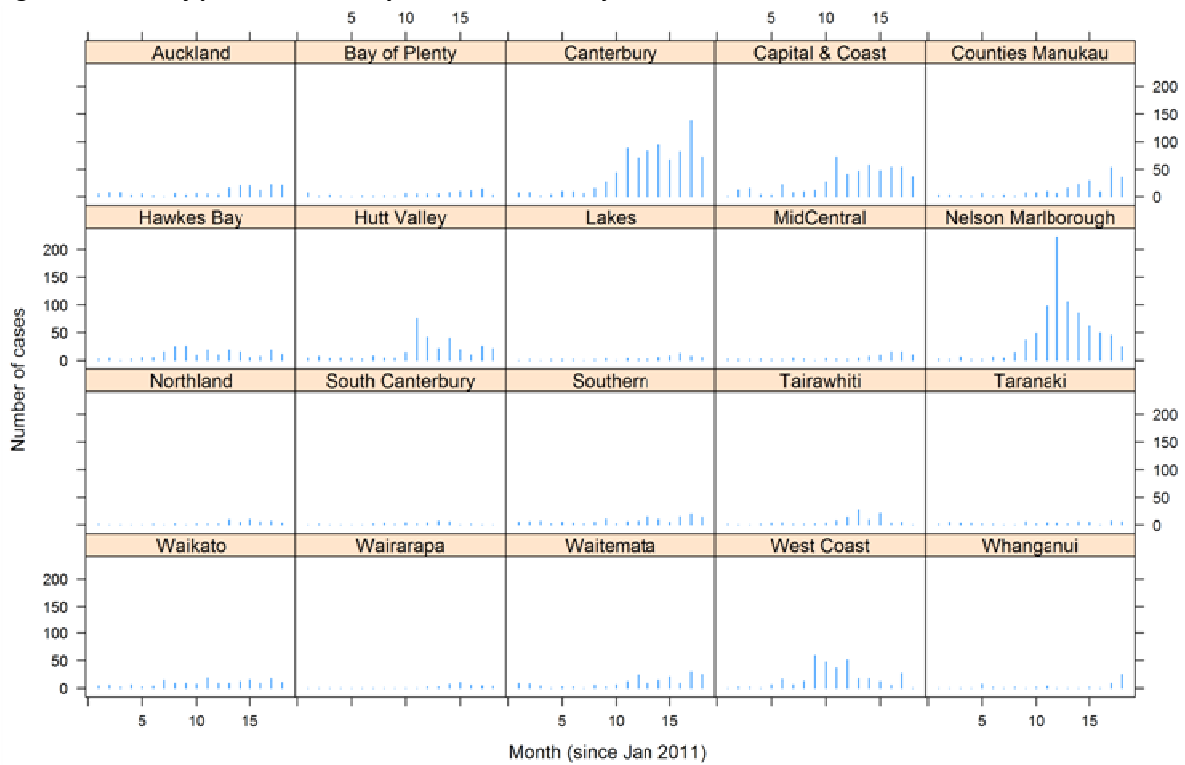


Figure 9: Monthly pertussis cases by DHB, since January 2011.



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>.