

# PERTUSSIS REPORT

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This report includes cases of pertussis reported in EpiSurv up to midnight 20 July 2012. Data were extracted from EpiSurv at 10.00 am 24 July 2012.

## Summary

In the past two surveillance weeks (7 July – 20 July 2012), 213 new cases of pertussis (114 and 99 cases, respectively) were notified, including 61 confirmed cases, 92 probable cases, 10 suspect cases, and 50 cases still under investigation. These numbers have decreased compared to the numbers reported over the previous two weeks (248 cases). Eleven (5.2%) of the notified cases were aged less than 1 year. Ten cases were hospitalised.

There has been a total of 2966 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 425 over the same period in 2011), including 1096 confirmed cases, 1637 probable cases, 103 suspect cases, and 130 cases still under investigation. 203 (6.8%) of the notified cases were in the less than 1 year age group. During this period, 144 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 (35 cases), Waikato and Capital and Coast (21 cases each), and Nelson Marlborough (12 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (299.5 per 100 000, 419 cases), followed by West Coast (282.2 per 100 000, 93 cases) and Tairāwhiti (171.7 per 100 000, 80 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (622 cases), followed by Nelson Marlborough (419 cases), Capital and Coast (341), Counties Manukau (192) and Hutt Valley (166) 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 20 July). 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 an increasing trend in notifications through April and May 2012, although since the beginning of June there has been a general decrease 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**

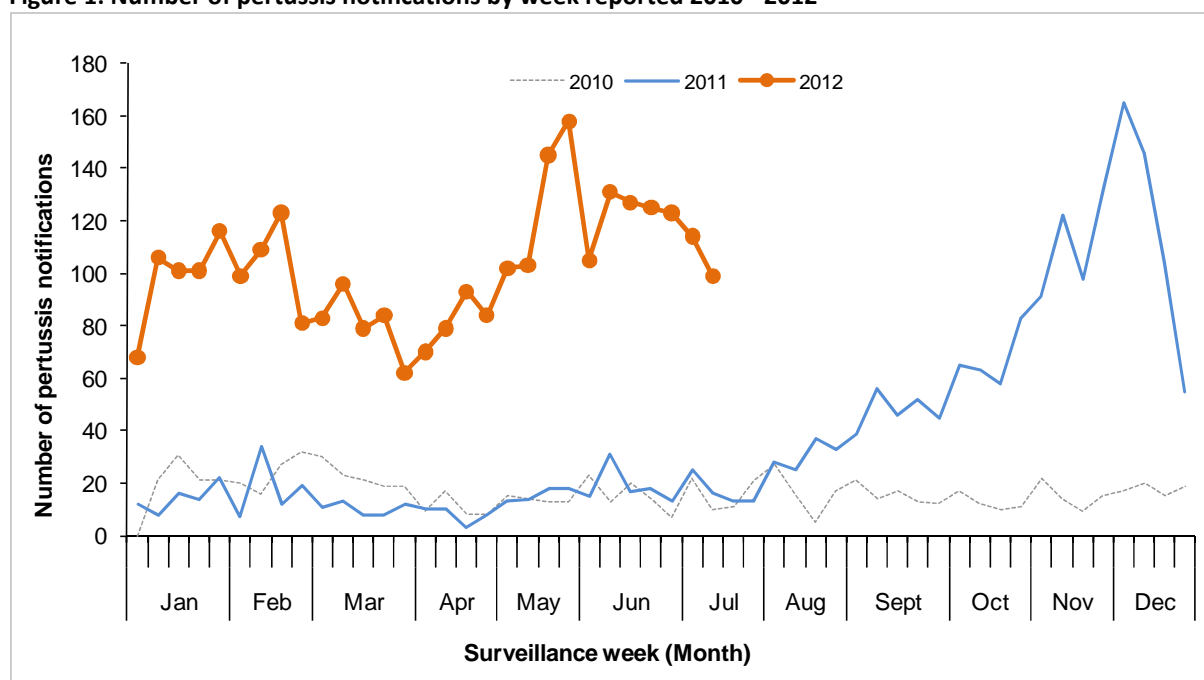
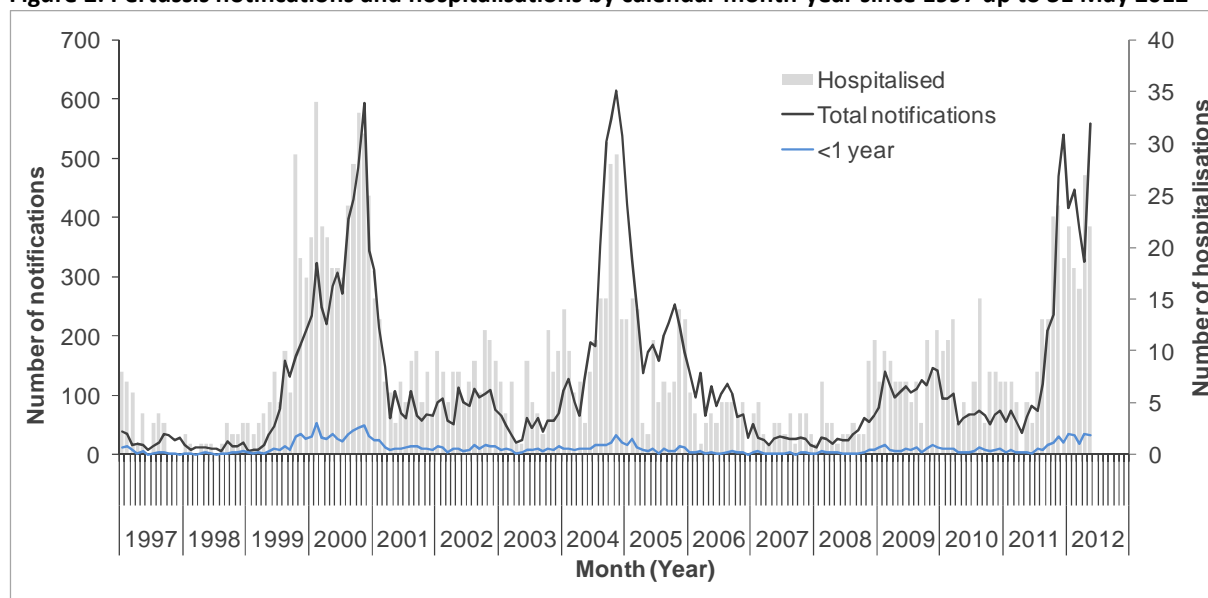


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 May 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, 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 (314.3 per 100 000 population, 196 cases), followed by the 1 to 4 years (191.4 per 100 000, 482 cases), and 5 to 9 years (121.8 per 100 000, 350 cases) age groups.

Of the 2835 cumulative cases with known age, 24 (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	196	314.3	87	9	6
1 to 4	482	191.4	9	29	1
5 to 9	350	121.8	6	24	1
10 to 14	245	83.6	2	11	0
15 to 19	148	46.6	4	8	0
20 to 29	250	40.4	2	15	0
30 to 39	323	57.4	6	18	0
40 to 49	350	55.4	7	22	0
50 to 59	232	41.7	11	14	1
60 to 69	155	37.1	5	7	0
70+	104	25.6	3	6	0
Unknown	1		0	0	0
<b>Overall</b>	<b>2836</b>	<b>64.4</b>	<b>142</b>	<b>163</b>	<b>9</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 7 July and 20 July 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 (111 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (77.6 per 100 000, 2090 cases), followed by Māori (64.7 per 100 000, 366 cases) and Pacific Peoples (46.4 per 100 000, 105 cases). Figure 3 shows the European ethnic group having the highest 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. 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 (Rate <sup>1</sup> )	<1 year (Rate <sup>1</sup> )	Hosp (% <sup>4</sup> )	New Cases	<1 year	Hosp
Māori	366 (64.7)	53 (377.1)	44 (12.0)	22	3	4
Pacific Peoples	105 (46.4)	25 (488.2)	28 (26.7)	6	1	0
Other	99 (26.4)	6 (114.2)	5 (5.1)	3	0	0
European	2090 (77.6)	105 (353.5)	61 (2.9)	111	5	5
Unknown	176	7	4	21	0	0
<b>Overall</b>	<b>2836 (70.4)</b>	<b>196 (346.1)</b>	<b>142 (5.0)</b>	<b>163</b>	<b>9</b>	<b>9</b>

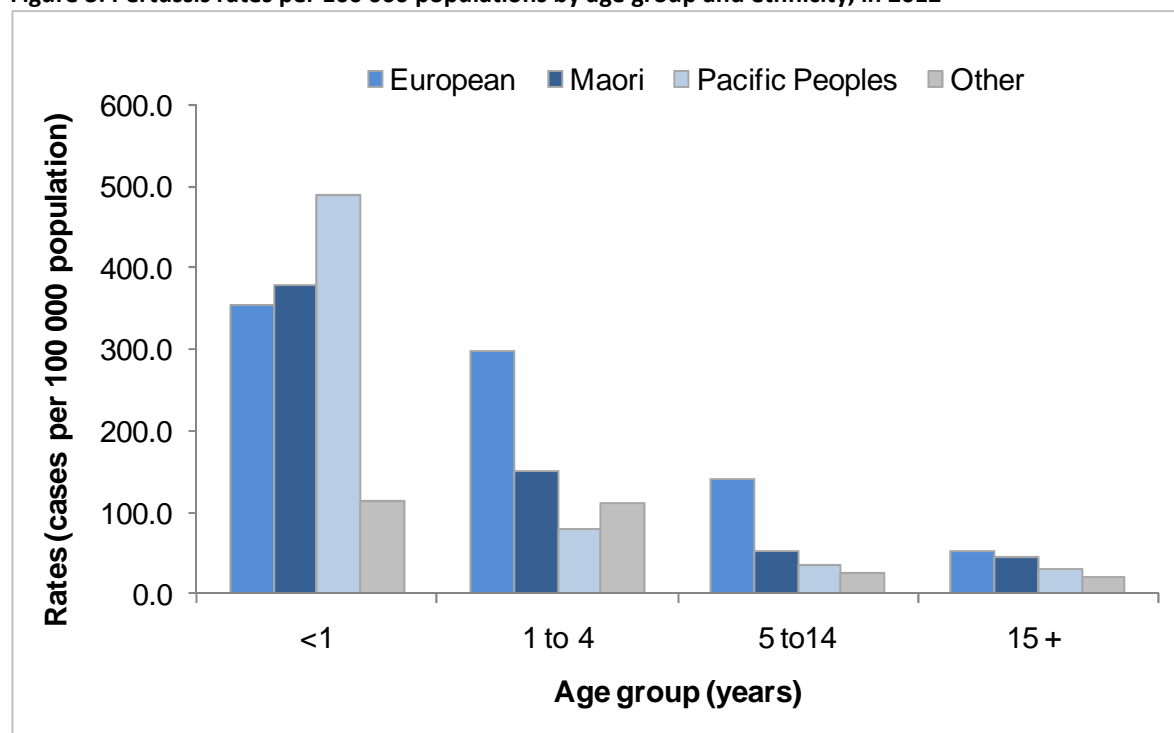
<sup>1</sup>Value in brackets denotes rate of pertussis cases per 100 000 population calculated using Census 2006 usually resident populations.

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

<sup>3</sup>Notifications between 7 July and 20 July 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.

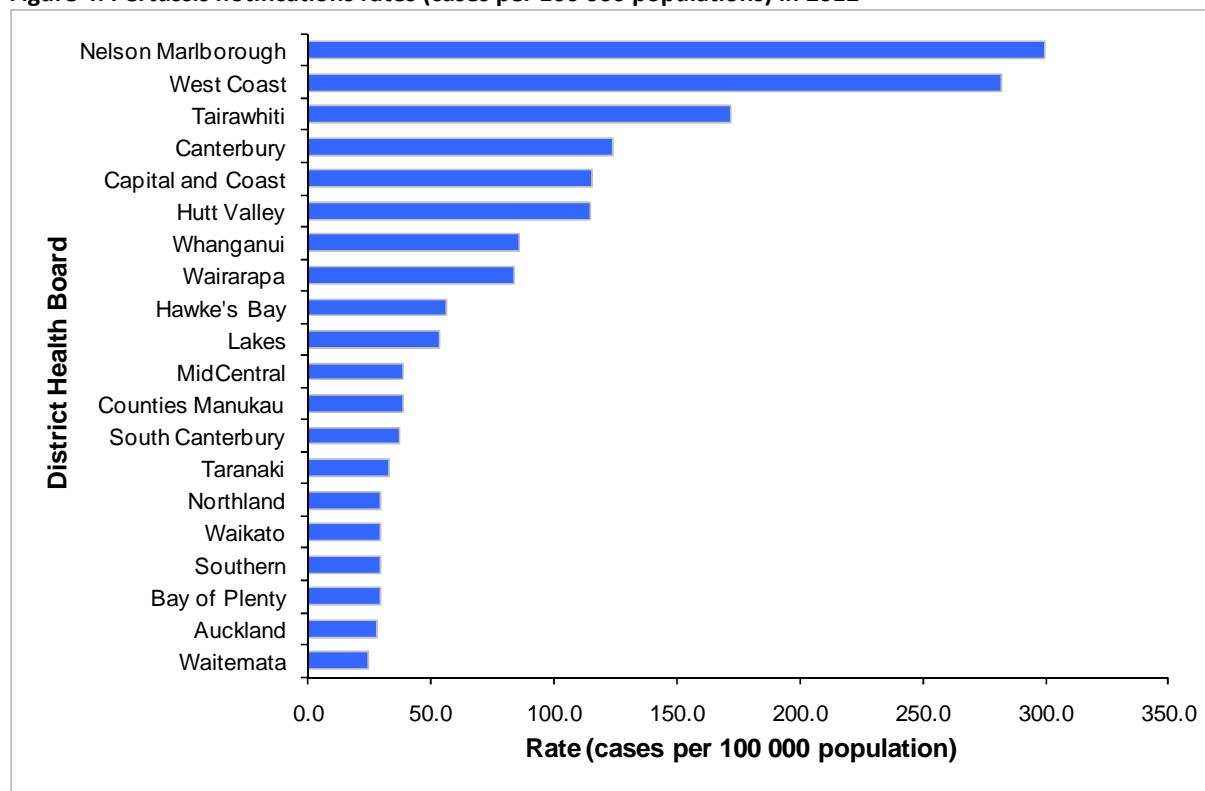
## Hospitalisations

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, nine hospitalisations were recorded. There have been 142 hospitalisations reported in EpiSurv in 2012. Eighty-seven (61.3%) of these were infants aged less than one year including 24 cases aged less than six weeks. Of the 2453 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (28.0%, 28/100), Māori (12.9%, 44/340), Other (5.7%, 5/88), and European (3.2%, 61/1925).

## 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 (35 cases), Waikato and Capital and Coast (21 cases each), and Nelson Marlborough (12 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (299.5 per 100 000, 419 cases), followed by West Coast (282.2 per 100 000, 93 cases) and Tairāwhiti (171.7 per 100 000, 80 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (622 cases), followed by Nelson Marlborough (419 cases), Capital and Coast (341), Counties Manukau (192) and Hutt Valley (166) 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 61 confirmed cases reported in the last two weeks, 40 (65.6%) had a known vaccination status. Of these 40 cases, 15 were not vaccinated. One case had received one dose of vaccine, one case had received two doses, six cases had received three doses, three cases had received four doses, and four cases reported having completed pertussis vaccination. A further 10 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 20 July)**

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		
							(no dose info)	Not vaccinated	Unknown
<6wks	1	0	0	0	0	0	0	1	0
6wks - 2mths	2	0	0	0	0	0	0	2	0
3-4 mths	2	1	0	0	0	0	0	1	0
5mths - 3yrs	10	0	0	5	1	0	0	3	1
4 - 10yrs	14	0	1	0	1	1	7	2	2
11+ yrs	32	0	0	1	1	3	3	6	18
Unknown	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>61</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>4</b>	<b>10</b>	<b>15</b>	<b>21</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 1096 confirmed cases with known age reported during 2012, 717 (65.4%) had a known vaccination status (Table 4). Of these 717 cases, 235 were not vaccinated, including 11 cases aged less than 6 weeks and thus not eligible for vaccination. Sixty-two cases had received one dose of vaccine, 15 cases had received two doses, 101 cases had received three doses, 102 cases had received four doses, and 59 cases reported having completed pertussis vaccination. A further 143 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	13	0	0	0	0	0	0	11	2
6wks - 2mths	30	15	0	0	0	0	0	12	3
3-4 mths	20	4	7	0	0	0	0	8	1
5mths - 3yrs	188	3	5	77	24	0	14	44	21
4 - 10yrs	261	6	1	15	64	37	36	73	29
11+ yrs	584	34	2	9	14	22	93	87	323
Unknown	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1096</b>	<b>62</b>	<b>15</b>	<b>101</b>	<b>102</b>	<b>59</b>	<b>143</b>	<b>235</b>	<b>379</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	47	29.7	4	2	0	0	0
Waitemata	135	24.7	12	14	11	1	1
Auckland	127	27.8	11	13	5	0	0
Counties Manukau	192	38.4	31	31	6	1	1
Waikato	109	29.6	7	8	21	2	3
Lakes	55	53.4	6	3	2	0	0
Bay of Plenty	62	29.3	2	2	5	0	0
Tairāwhiti	80	171.7	9	1	0	0	0
Taranaki	36	32.8	1	2	5	0	1
Hawke's Bay	88	56.5	8	5	4	0	0
Whanganui	54	85.6	9	9	11	2	2
MidCentral	65	38.6	5	5	2	0	0
Hutt Valley	166	114.9	8	3	14	0	0
Capital and Coast	341	115.7	18	4	21	0	0
Wairarapa	34	83.8	3	6	0	0	0
Nelson Marlborough	419	299.5	22	4	12	1	0
West Coast	93	282.2	2	1	6	0	0
Canterbury	622	123.7	25	17	35	2	1
South Canterbury	21	37.2	0	2	0	0	0
Southern	90	29.4	13	10	3	0	0
<b>Total</b>	<b>2836</b>	<b>64.4</b>	<b>196</b>	<b>142</b>	<b>163</b>	<b>9</b>	<b>9</b>

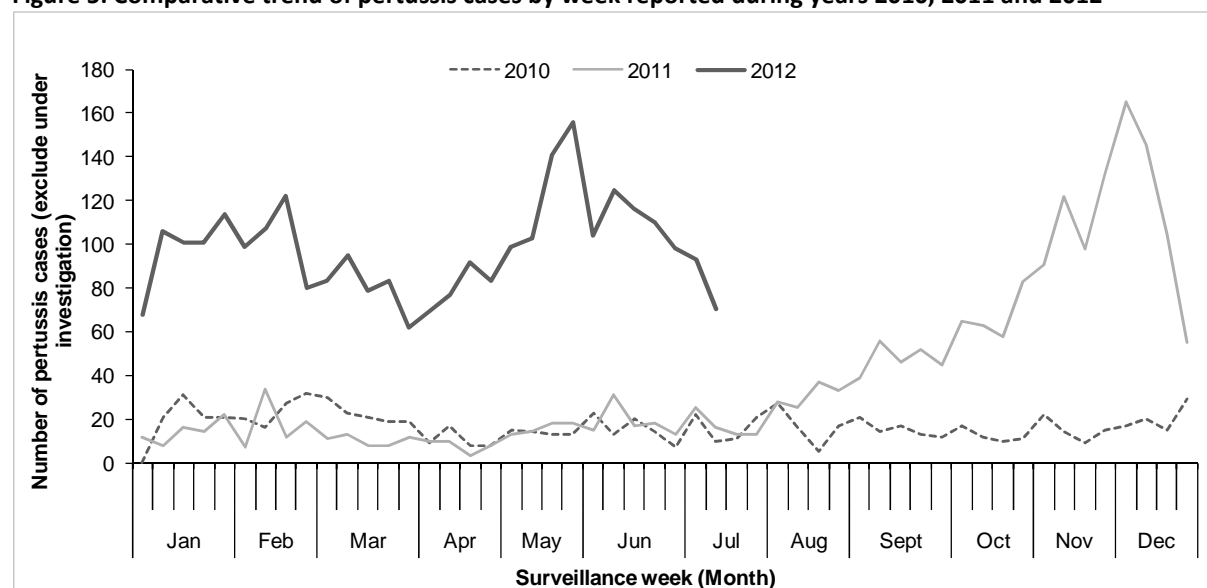
<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

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

<sup>3</sup>Notifications between 7 July and 20 July 2012 inclusive

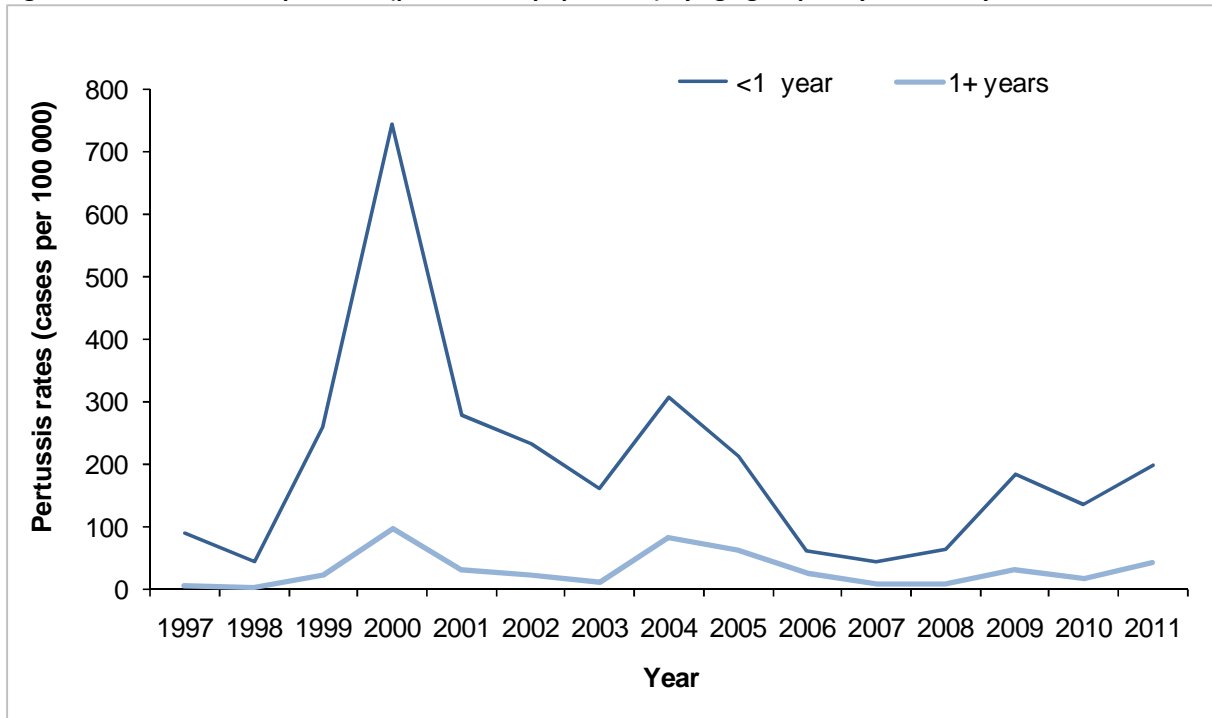
\*Cases in the less than 1 year age group

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



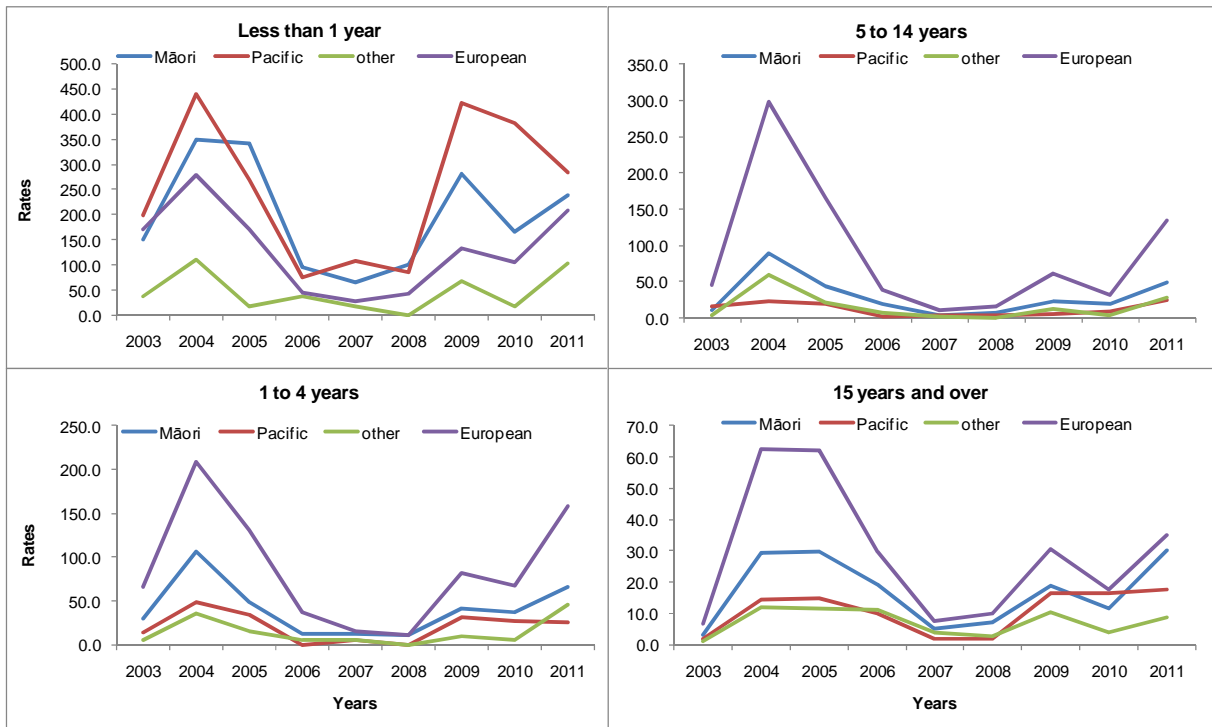
**Note:** Includes confirmed, probable and suspect cases only.

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

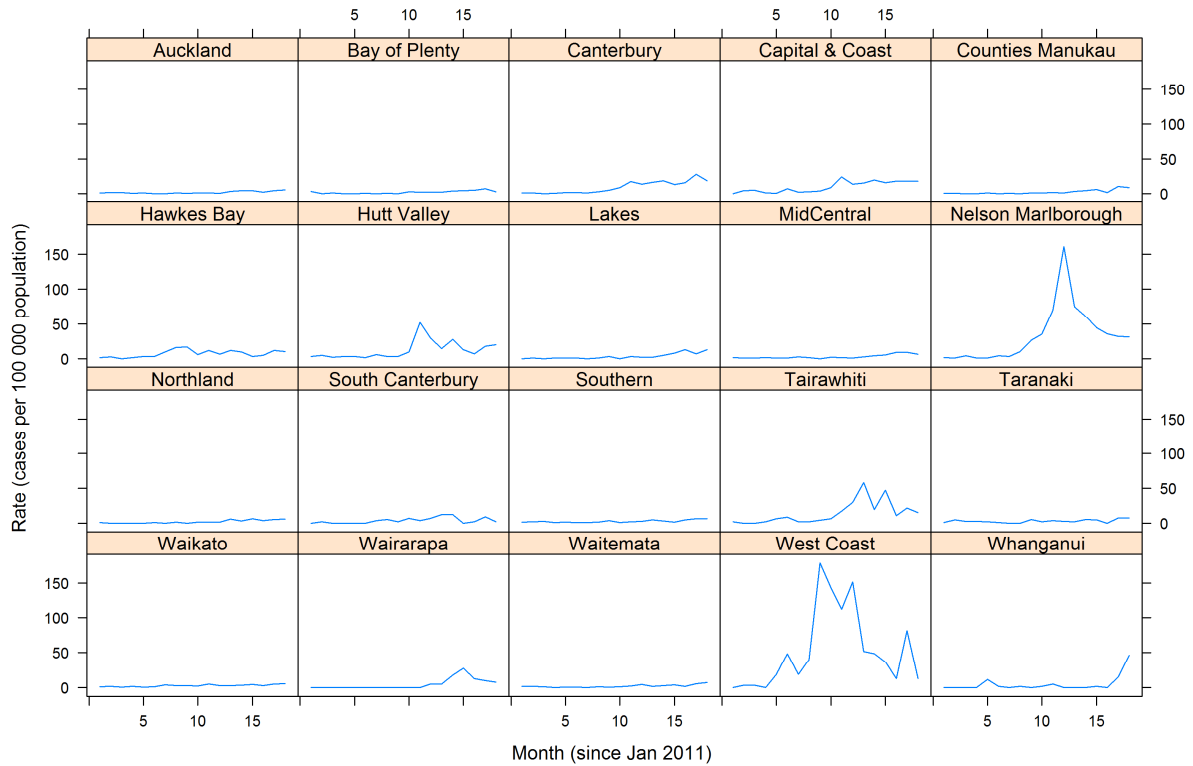
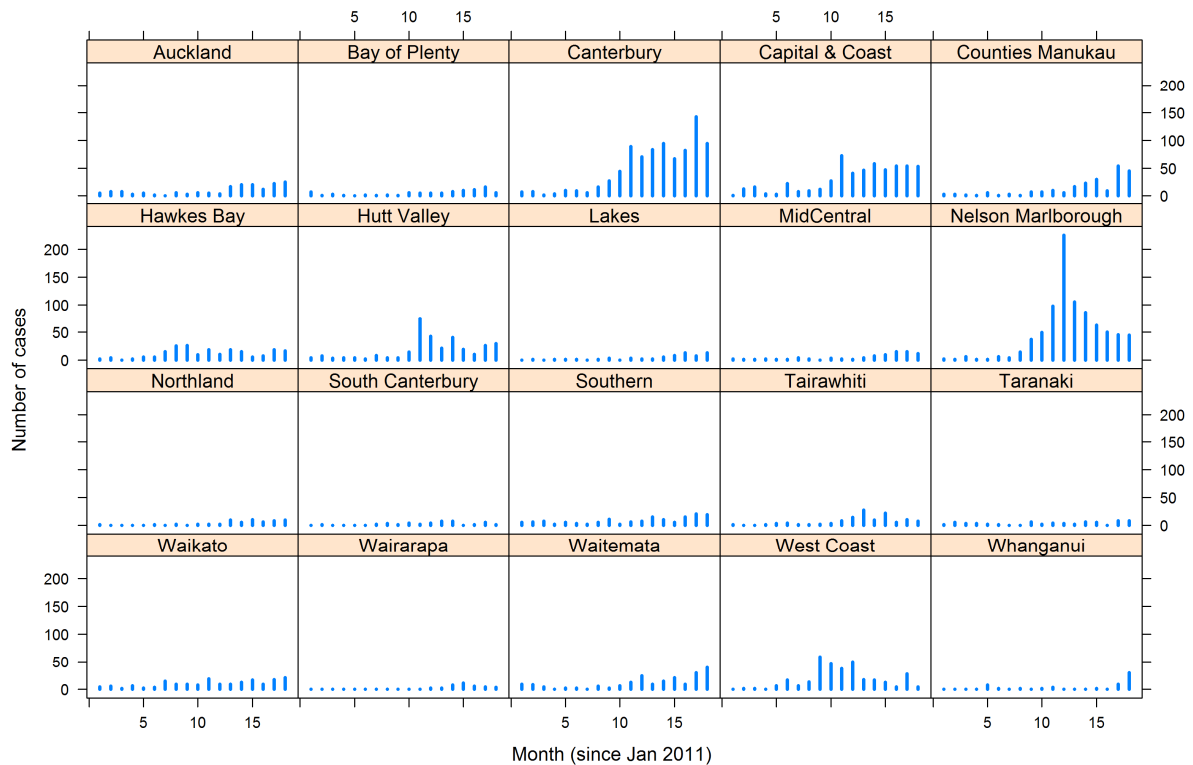


Figure 9: Monthly pertussis cases by DHB, since January 2011



**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>.