

# PERTUSSIS REPORT

May 2012

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This report includes cases of pertussis reported in EpiSurv up to midnight 25 May 2012. Data were extracted from EpiSurv at 10.00 am 29 May 2012.

## Summary

In the past two surveillance weeks (12 May – 25 May 2012), 267 new cases of pertussis (106 and 161 cases, respectively) were notified, including 59 confirmed cases, 136 probable cases, 13 suspect cases, and 59 cases still under investigation. These numbers have increased compared to the numbers reported over the previous two weeks (187 cases). Fifteen (5.8%) of the notified cases were aged less than 1 year. Nine cases were hospitalised.

There has been a total of 2008 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 275 over the same period in 2011), including 748 confirmed cases, 1105 probable cases, 54 suspect cases, and 101 cases still under investigation. 147 (7.3%) of the notified cases were in the less than 1 year age group. During this period, 98 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 (60 cases), Capital and Coast (24 cases), and Nelson Marlborough (20 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (237.3 per 100 000, 332 cases), followed by West Coast (185.1 per 100 000, 61 cases) and Tairāwhiti (137.3 per 100 000, 64 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (438 cases), followed by Nelson Marlborough (332 cases), Capital and Coast (242), Hutt Valley (114) and Counties Manukau (109) DHBs.

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.

## Temporal distribution of pertussis cases

Figure 1 shows weekly total pertussis notifications for 2010, 2011 and 2012 (to week ending 25 May). 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 has been a decreasing trend in notifications through February and March 2012, although since the beginning of April there has been an 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: Comparative trend of pertussis notifications by week reported during years 2010, 2011 and 2012**

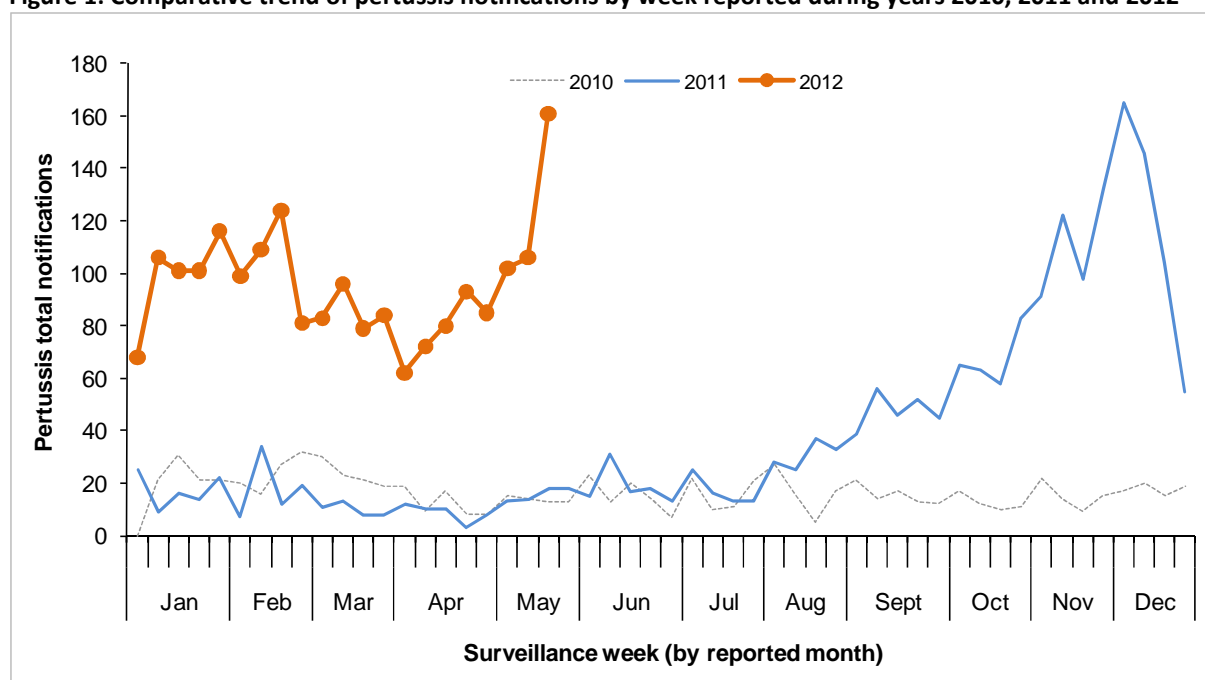
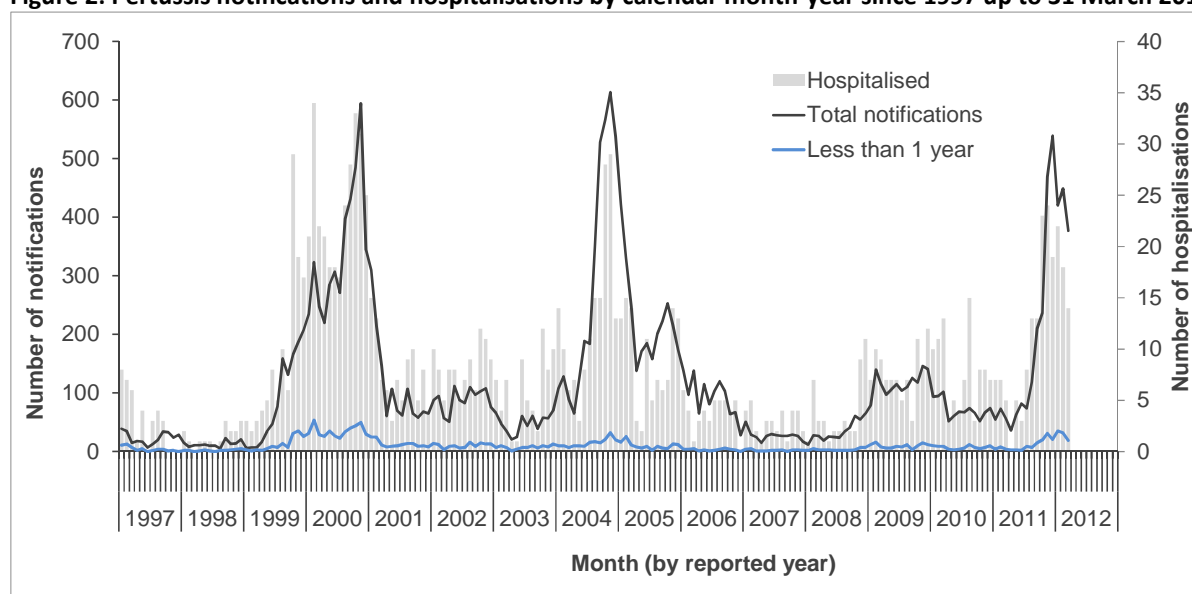


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 March 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, 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 March 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 (229.3 per 100 000 population, 143 cases), followed by the 1 to 4 years (131.4 per 100 000, 331 cases), and 5 to 9 years (77.3 per 100 000, 222 cases) age groups.

Of the 1900 cumulative cases with known age, 17 (0.9%) 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<sup>1</sup> 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	Rates <sup>1</sup>	Hosp	New Cases	Hosp
<1	143	229.3	60	13	3
1 to 4	331	131.4	6	32	1
5 to 9	222	77.3	4	29	1
10 to 14	153	52.2	2	27	0
15 to 19	94	29.6	2	12	1
20 to 29	167	27.0	2	24	0
30 to 39	215	38.2	5	17	0
40 to 49	252	39.9	5	17	0
50 to 59	149	26.8	8	10	2
60 to 69	97	23.2	1	14	0
70+	77	18.9	1	6	0
Unknown	7		0	7	0
<b>Overall</b>	<b>1907</b>	<b>43.3</b>	<b>96</b>	<b>208</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 12 May and 25 May 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 (53.9 per 100 000, 1453 cases), followed by Māori (41.7 per 100 000, 236 cases) and Pacific Peoples (33.6 per 100 000, 76 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. 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
Maori	236 (41.7)	35 (249.4)	27 (11.4)	23	0	0
Pacific Peoples	76 (33.6)	19 (371.0)	21 (27.6)	8	2	2
Other	70 (18.7)	4 (76.1)	2 (2.9)	7	0	0
European	1453 (53.9)	79 (266.0)	43 (3.0)	145	10	5
Unknown	72	6	3	25	1	1
<b>Overall</b>	<b>1907</b>	<b>143</b>	<b>96</b>	<b>208</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.

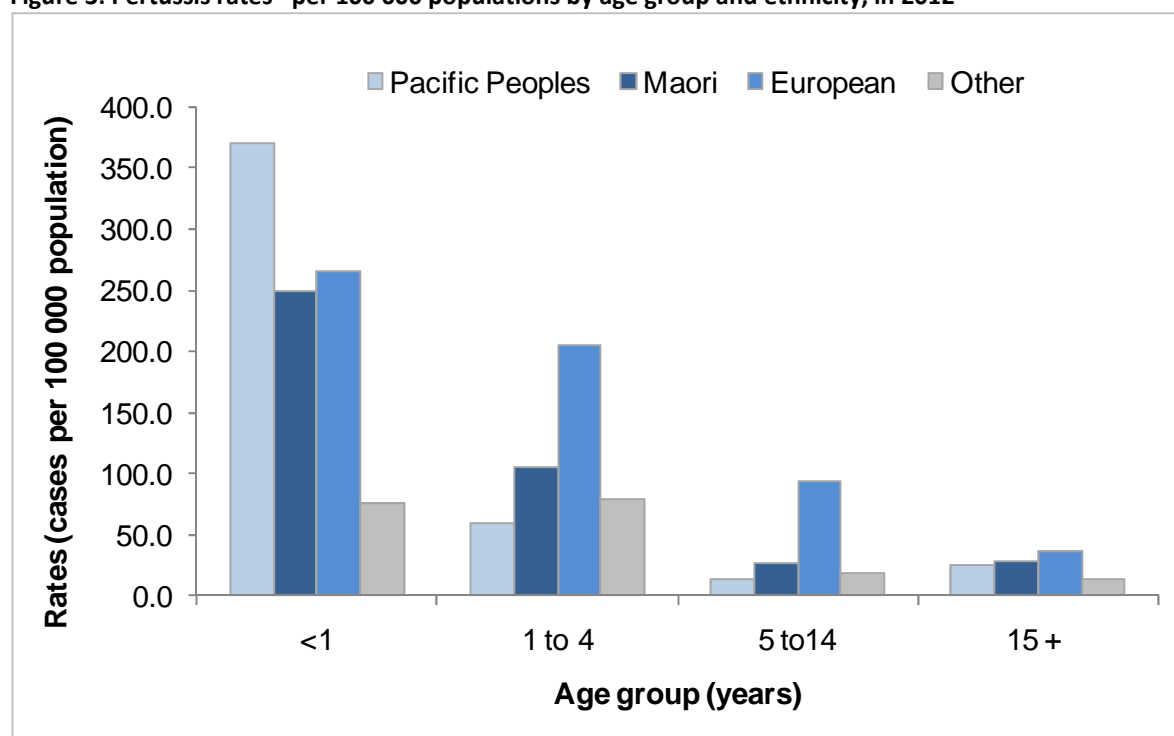
<sup>2</sup> Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup> Notifications between 12 May and 25 May 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**



\* 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. These rates have been

highest among Pacific Peoples in the less than 1 year age group, while in other age groups rates have been highest in the European ethnic group. Note that these rates are for all notifications.

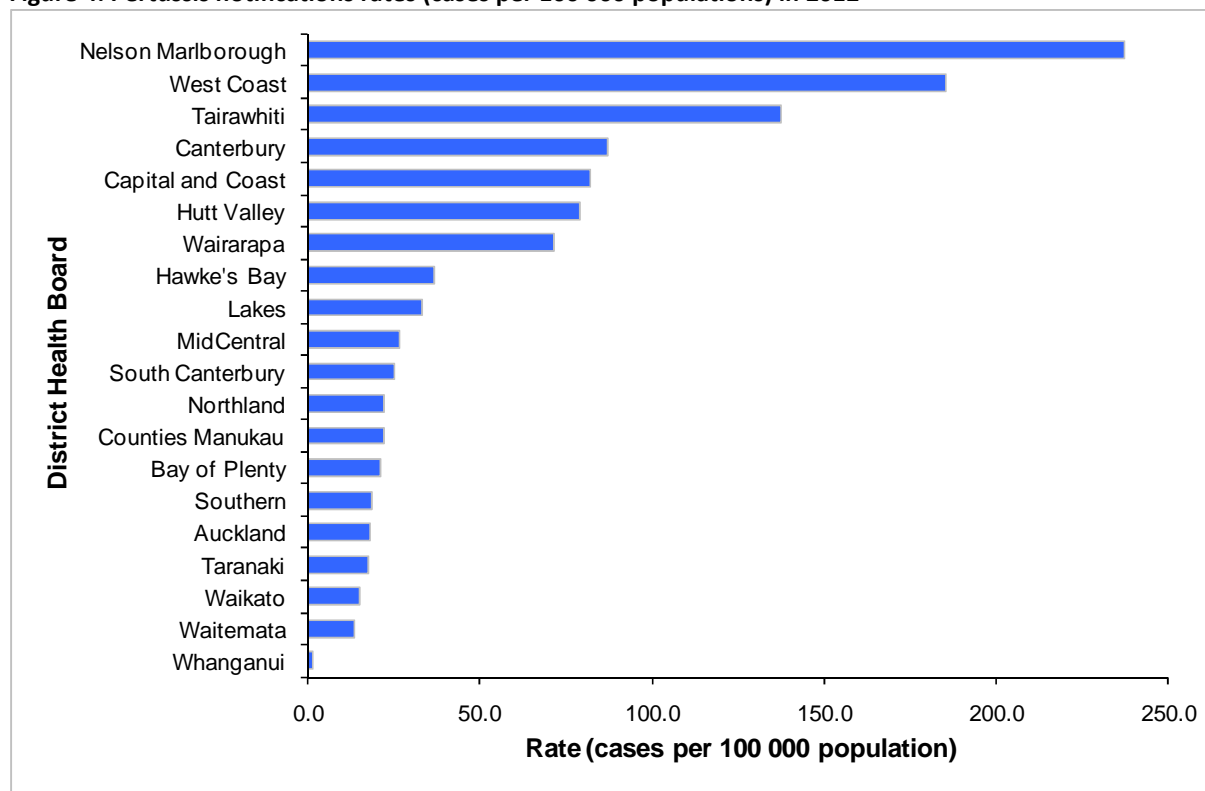
## Hospitalisations

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 96 hospitalisations reported in EpiSurv in 2012. Sixty (62.5%) of these were infants aged less than one year including 17 cases aged less than six weeks. Of the 1673 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (29.6%, 21/71), Māori (12.5%, 27/216), Other (3.3%, 2/60), and European (3.2%, 43/1326).

## 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 (60 cases), Capital and Coast (24 cases), and Nelson Marlborough (20 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (237.3 per 100 000, 332 cases), followed by West Coast (185.1 per 100 000, 61 cases) and Tairāwhiti (137.3 per 100 000, 64 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (438 cases), followed by Nelson Marlborough (332 cases), Capital and Coast (242), Hutt Valley (114) and Counties Manukau (109) DHBs. Cases in the under 1 year age group by DHB are shown in Table 5 (appendix).

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



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 59 confirmed cases reported in the last two weeks, 30 (50.8%) had a known vaccination status. Of these 30 cases, 10 were not vaccinated. Five cases had received one dose of vaccine, one case had received two doses, four cases had received three doses, three cases had received four doses and one case reported having completed pertussis vaccination. A further six cases reported being vaccinated but no dose information was available.

**Table 3: Immunisation status<sup>1</sup> of pertussis cases (confirmed) notified in the last two weeks (ending 25 May)**

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		Unknown
							(no dose info)	Not vaccinated	
<6wks	0	0	0	0	0	0	0	0	0
6wks - 2mths	1	0	0	0	0	0	0	1	0
3-4 mths	1	0	1	0	0	0	0	0	0
5mths - 3yrs	8	0	0	2	0	0	1	3	2
4 - 10yrs	15	0	0	2	3	1	2	4	3
11+ yrs	34	5	0	0	0	0	3	2	24
Total	59	5	1	4	3	1	6	10	29

<sup>1</sup>Immunisation status has been extracted from Episurv notifications and is based on parental recall or Well Child book records only.

Of the 748 confirmed cases with known age reported during 2012, 496 (66.3%) had a known vaccination status (Table 4). Of these 496 cases, 163 were not vaccinated, including six cases aged less than 6 weeks and thus not eligible for vaccination. Fifty cases had received one dose of vaccine, eight cases had received two doses, 78 cases had received three doses, 62 cases had received four doses, and 33 cases reported having completed pertussis vaccination. A further 102 cases reported being vaccinated but no dose information was available.

**Table 4: Immunisation status<sup>1</sup> 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		Unknown
							(no dose info)	Not vaccinated	
<6wks	7	0	0	0	0	0	0	6	1
6wks - 2mths	20	12	0	0	0	0	0	7	1
3-4 mths	14	3	3	0	0	0	1	7	0
5mths - 3yrs	148	1	4	61	15	0	13	37	17
4 - 10yrs	160	5	0	12	38	21	15	51	18
11+ yrs	399	29	1	5	9	12	73	55	215
Total	748	50	8	78	62	33	102	163	252

<sup>1</sup>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>	Hosp	<1 year*	New Cases	Hosp	<1 year*
Northland	35	22.1	2	4	3	0	0
Waitemata	73	13.4	9	7	10	0	2
Auckland	82	18.0	10	9	8	2	0
Counties Manukau	109	21.8	21	23	18	2	1
Waikato	56	15.2	4	3	7	0	0
Lakes	34	33.0	0	1	3	0	0
Bay of Plenty	45	21.2	2	2	8	1	0
Tairāwhiti	64	137.3	1	7	1	0	0
Taranaki	19	17.3	0	1	2	0	1
Hawke's Bay	57	36.6	4	5	8	0	0
Whanganui	1	1.6	0	0	0	0	0
MidCentral	45	26.7	2	5	5	0	0
Hutt Valley	114	78.9	3	7	13	0	1
Capital and Coast	242	82.1	4	15	24	0	3
Wairarapa	29	71.5	6	3	2	0	0
Nelson Marlborough	332	237.3	4	18	20	1	2
West Coast	61	185.1	1	2	10	0	0
Canterbury	438	87.1	12	18	60	1	2
South Canterbury	14	24.8	1	0	0	0	0
Southern	57	18.6	10	13	6	1	1
<b>Total</b>	<b>1907</b>	<b>43.3</b>	<b>96</b>	<b>143</b>	<b>208</b>	<b>8</b>	<b>13</b>

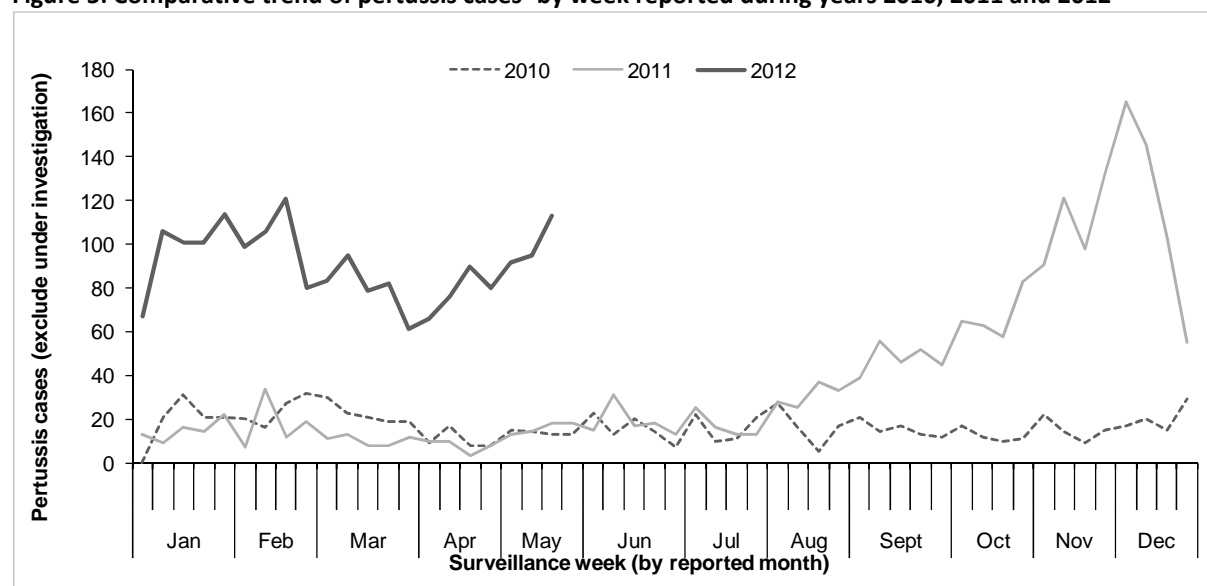
<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

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

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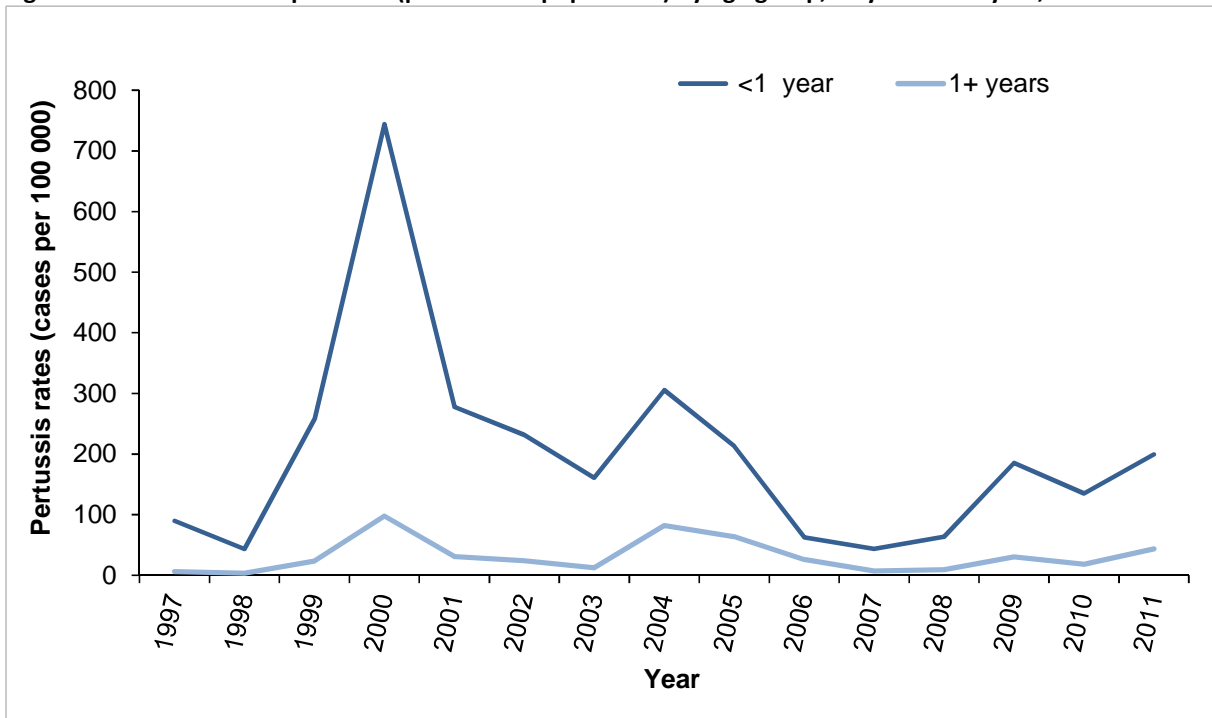
\*Cases in the less than 1 year age group

**Figure 5: Comparative trend of pertussis cases<sup>1</sup> by week reported during years 2010, 2011 and 2012**



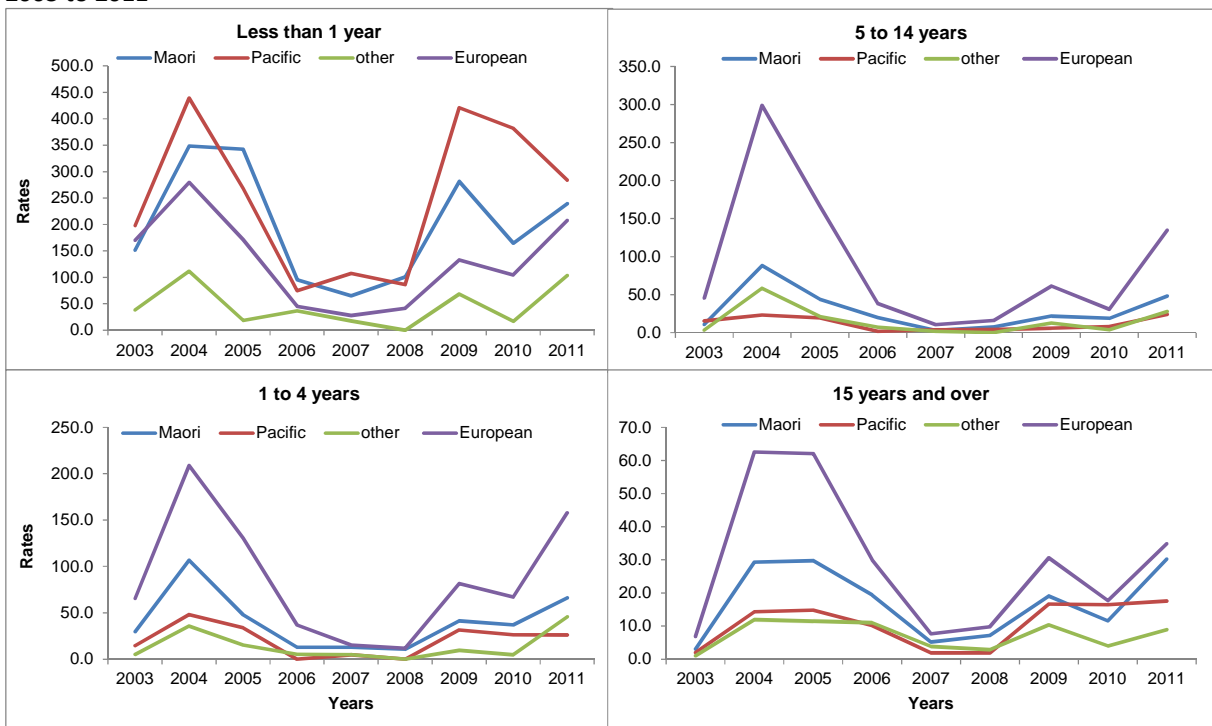
<sup>1</sup>Includes confirmed, probable and suspect cases only.

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



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

Figure 7: Trends in cumulative pertussis rates<sup>1</sup> (per 100 000 population) by age group and ethnicity, 2003 to 2011



<sup>1</sup>Rate of pertussis notified cases per 100 000 population (includes cases under investigation) calculated using mid-year population estimates



**Case classification for pertussis notification in New Zealand**

<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.

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