

PERTUSSIS REPORT

This report includes cases of pertussis reported in EpiSurv up to midnight 31 August 2012. Data were extracted from EpiSurv at 10.00 am 4 September 2012.

Summary

In the past two surveillance weeks (18 August – 31 August 2012), 273 new cases of pertussis (122 and 151 cases, respectively) were notified, including 79 confirmed cases, 102 probable cases, 25 suspect cases, and 67 cases still under investigation. The numbers have decreased slightly compared to the numbers reported over the previous two weeks (290 cases). Fifteen (5.5%) of the notified cases were aged less than 1 year. Five cases were hospitalised.

There has been a total of 3699 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 574 over the same period in 2011), including 1359 confirmed cases, 2006 probable cases, 159 suspect cases, and 175 cases still under investigation. 251 (6.8%) of the notified cases were in the less than 1 year age group. During this period, 170 hospitalisations and one death have been reported.

In the last two weeks, the highest number of cases (excluding cases under investigation) was reported in Canterbury (54 cases), Capital and Coast (34 cases), and Waikato (24 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (347.4 per 100 000, 486 cases), followed by West Coast (324.6 per 100 000, 107 cases) and Tairāwhiti (176.0 per 100 000, 82 cases) DHBs. During this same period the highest number of notifications was reported from Canterbury DHB (779 cases), followed by Nelson Marlborough (486 cases), Capital and Coast (449), Counties Manukau (219) and Hutt Valley (214) 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 31 August). 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 increasing more or less consistently. There was an increasing trend in notifications through April and May 2012, followed by a general decrease since the beginning of June. However, weekly notifications had the highest spike (during week 32) this year and since 2010. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition. One death has 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

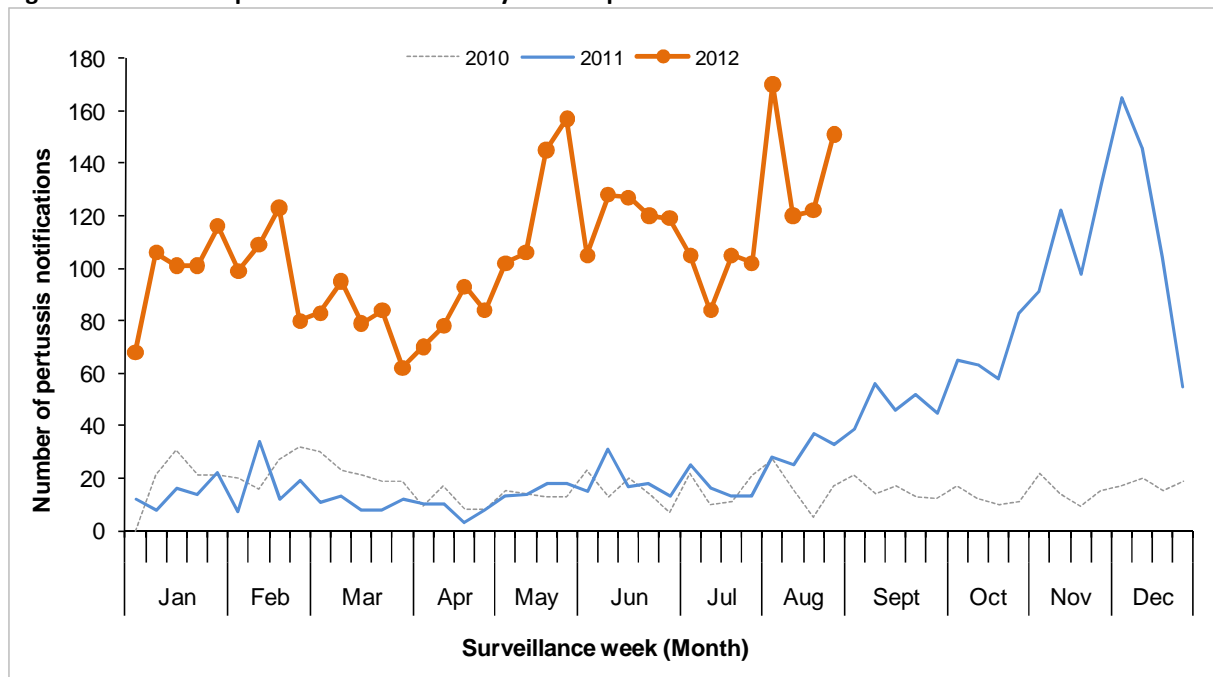
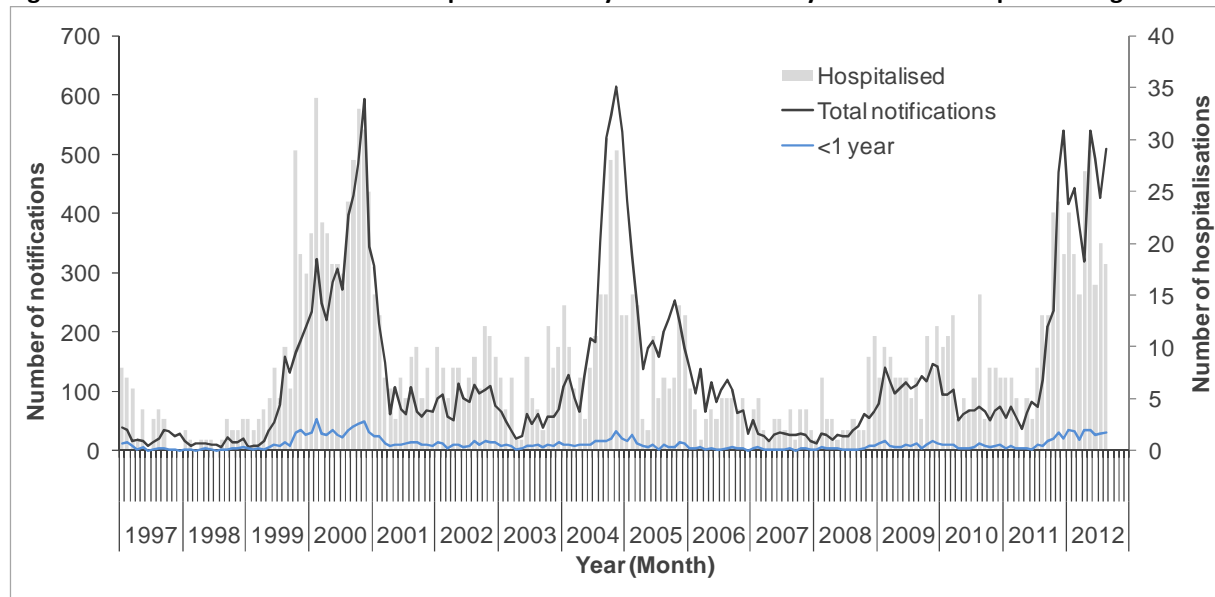


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 August 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, 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 August 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 (384.8 per 100 000 population, 240 cases), followed by the 1 to 4 years (233.0 per 100 000, 587 cases), and 5 to 9 years (158.4 per 100 000, 455 cases) age groups.

Of the 3524 cumulative cases with known age, 26 (0.7%) 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 ² notifications			Last two weeks ³	
	All cases ¹	Rates ¹	Hosp	New Cases	Hosp
<1	240	384.8	99	9	2
1 to 4	587	233.0	14	28	2
5 to 9	455	158.4	6	37	0
10 to 14	319	108.9	2	23	0
15 to 19	169	53.3	4	7	0
20 to 29	318	51.4	3	24	0
30 to 39	409	72.7	7	17	0
40 to 49	429	67.9	7	28	0
50 to 59	269	48.4	12	18	0
60 to 69	198	47.4	6	11	0
70+	131	32.2	6	4	0
Unknown	0		0	0	0
Overall	3524	80.0	166	206	4

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

²Cumulative notifications (excluding cases under investigation) since 31 December 2011

³Notifications between 18 August and 31 August 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 (99.2 per 100 000, 2671 cases), followed by Māori (82.1 per 100 000, 464 cases) and Pacific Peoples (56.1 per 100 000, 127 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 Māori.

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

Ethnicity	Cumulative ² notifications			Last two weeks ³		
	All cases (Rate ¹)	<1 year (Rate ¹)	Hosp (% ⁴)	New Cases	<1 year	Hosp
Māori	464 (82.1)	71 (506.0)	53 (11.4)	30	3	2
Pacific Peoples	127 (56.1)	28 (546.8)	29 (22.8)	5	1	0
Other	133 (35.5)	10 (190.4)	7 (5.3)	7	2	1
European	2671 (99.2)	128 (430.9)	77 (2.9)	145	2	1
Unknown	129	0	0	19	0	0
Overall	3524 (84.3)	237 (418.5)	166 (4.9)	206	8	4

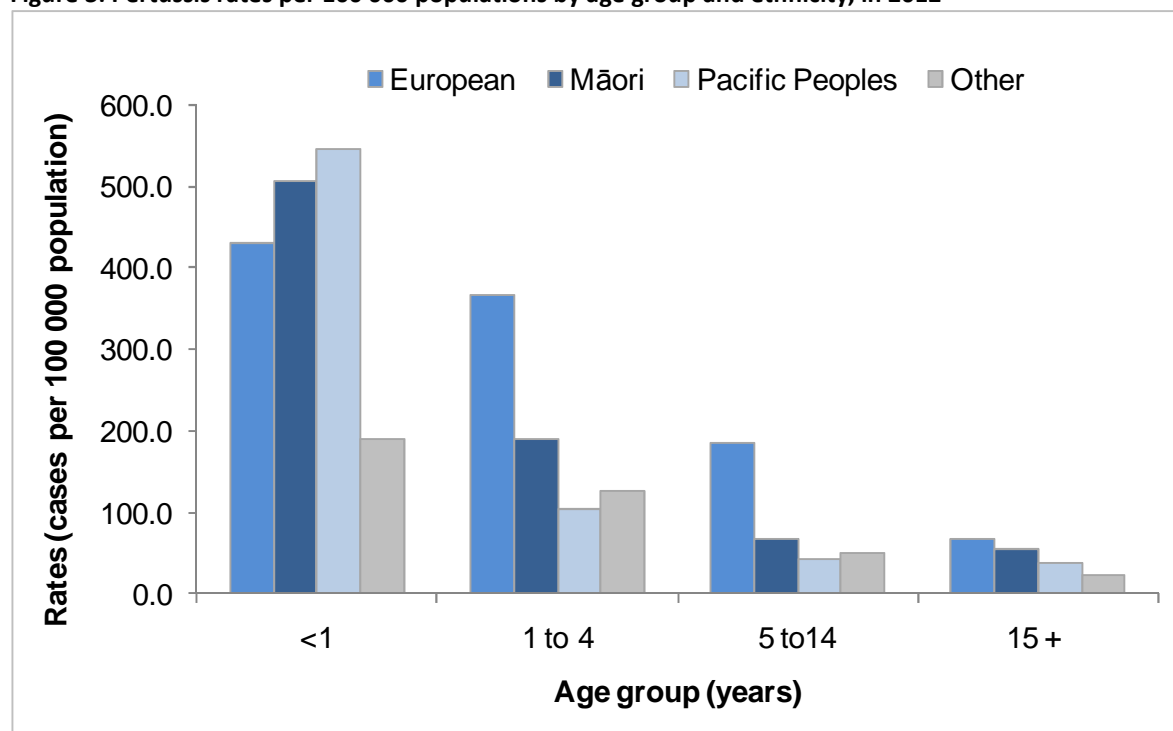
¹Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

²Cumulative notifications (excluding cases under investigation) since 31 December 2011

³Notifications between 18 August and 31 August 2012 inclusive

⁴Percentage 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.

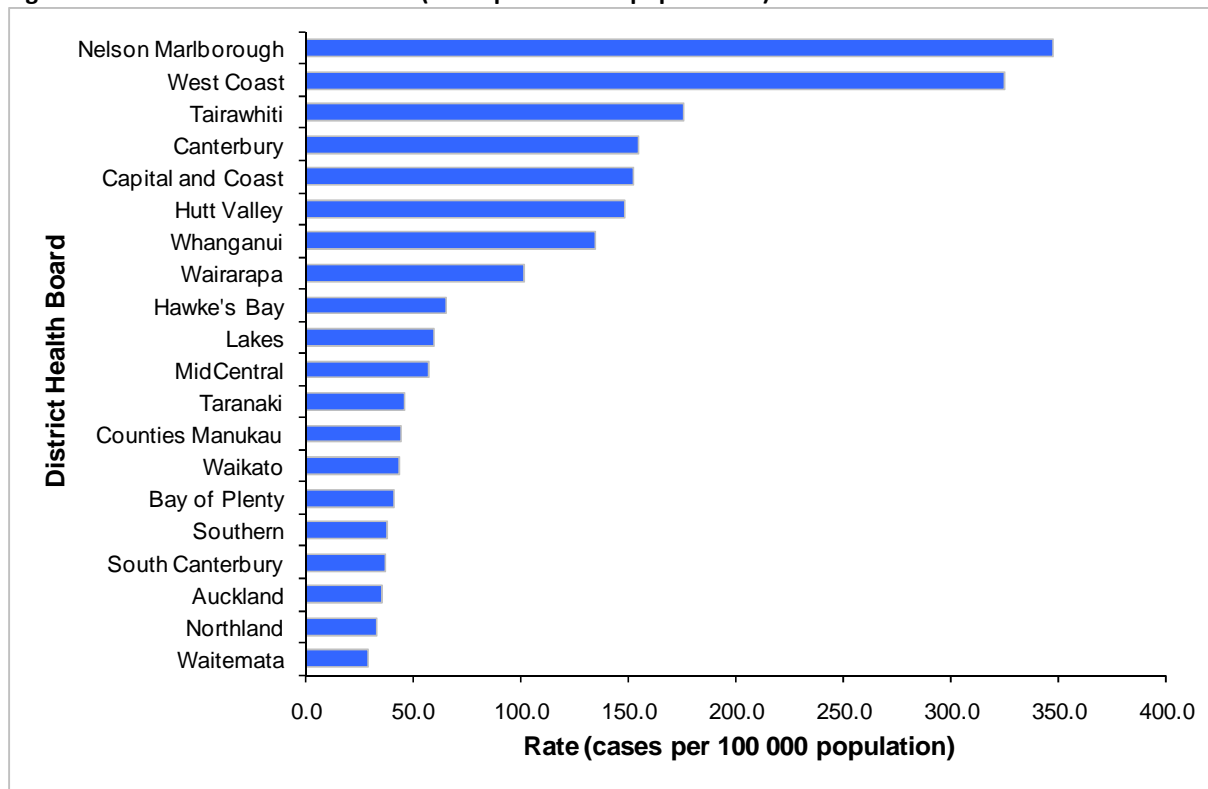
Hospitalisations

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, four hospitalisations were recorded. There have been 166 hospitalisations reported in EpiSurv in 2012. Ninety-nine (59.6%) of these were infants aged less than one year including 25 cases aged less than six weeks. Of the 3092 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (24.4%, 29/119), Māori (12.6%, 53/420), Other (5.9%, 7/119), and European (3.2%, 77/2434).

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 (54 cases), Capital and Coast (34 cases) and Waikato (24 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (347.4 per 100 000, 486 cases), followed by West Coast (324.6 per 100 000, 107 cases) and Tairāwhiti (176.0 per 100 000, 82 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (779 cases), followed by Nelson Marlborough (486 cases), Capital and Coast (449), Counties Manukau (219) and Hutt Valley (214) 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 79 confirmed cases reported in the last two weeks, 51 (64.6%) had a known vaccination status. Of these 51 cases, 16 were not vaccinated. One case had received one dose of vaccine, two cases had received two doses, eight cases had received three doses, five cases had received four doses, and four cases reported having completed pertussis vaccination. A further 15 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 31 August)

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	0	0	0	0	0	0	0	0	0
3-4 mths	1	0	1	0	0	0	0	0	0
5mths - 3yrs	10	0	0	5	0	0	1	3	1
4 - 10yrs	26	0	1	1	5	3	4	8	4
11+ yrs	42	1	0	2	0	1	10	5	23
Unknown	0	0	0	0	0	0	0	0	0
Total	79	1	2	8	5	4	15	16	28

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 1359 confirmed cases with known age reported during 2012, 908 (66.8%) had a known vaccination status (Table 4). Of these 908 cases, 298 were not vaccinated, including 12 cases aged less than 6 weeks and thus not eligible for vaccination. Seventy-seven cases had received one dose of vaccine, 21 cases had received two doses, 129 cases had received three doses, 127 cases had received four doses, and 81 cases reported having completed pertussis vaccination. A further 175 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	14	0	0	0	0	0	0	12	2
6wks - 2mths	42	24	1	0	0	0	0	13	4
3-4 mths	24	6	9	0	0	0	0	8	1
5mths - 3yrs	238	3	7	99	29	1	14	63	22
4 - 10yrs	340	7	2	18	83	52	46	97	35
11+ yrs	701	37	2	12	15	28	115	105	387
Unknown	0	0	0	0	0	0	0	0	0
Total	1359	77	21	129	127	81	175	298	451

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 ² notifications				Last two weeks ³		
	All cases	Rates ¹	<1 year*	Hosp	New Cases	<1 year*	Hosp
Northland	52	32.9	5	3	1	0	0
Waitemata	156	28.6	14	15	7	0	0
Auckland	162	35.5	12	14	12	1	1
Counties Manukau	219	43.8	34	35	3	0	0
Waikato	160	43.5	9	10	24	1	2
Lakes	61	59.2	9	5	2	0	0
Bay of Plenty	87	41.1	4	3	10	0	0
Tairāwhiti	82	176.0	9	1	1	0	0
Taranaki	50	45.5	4	4	5	1	0
Hawke's Bay	102	65.5	8	5	2	0	0
Whanganui	85	134.8	10	9	6	0	0
MidCentral	96	57.0	8	6	8	0	0
Hutt Valley	214	148.1	9	4	15	0	1
Capital and Coast	449	152.4	21	4	34	1	0
Wairarapa	41	101.0	4	7	1	0	0
Nelson Marlborough	486	347.4	30	7	13	2	0
West Coast	107	324.6	2	1	1	0	0
Canterbury	779	155.0	32	20	54	3	0
South Canterbury	21	37.2	0	2	0	0	0
Southern	115	37.5	16	11	7	0	0
Total	3524	80.0	240	166	206	9	4

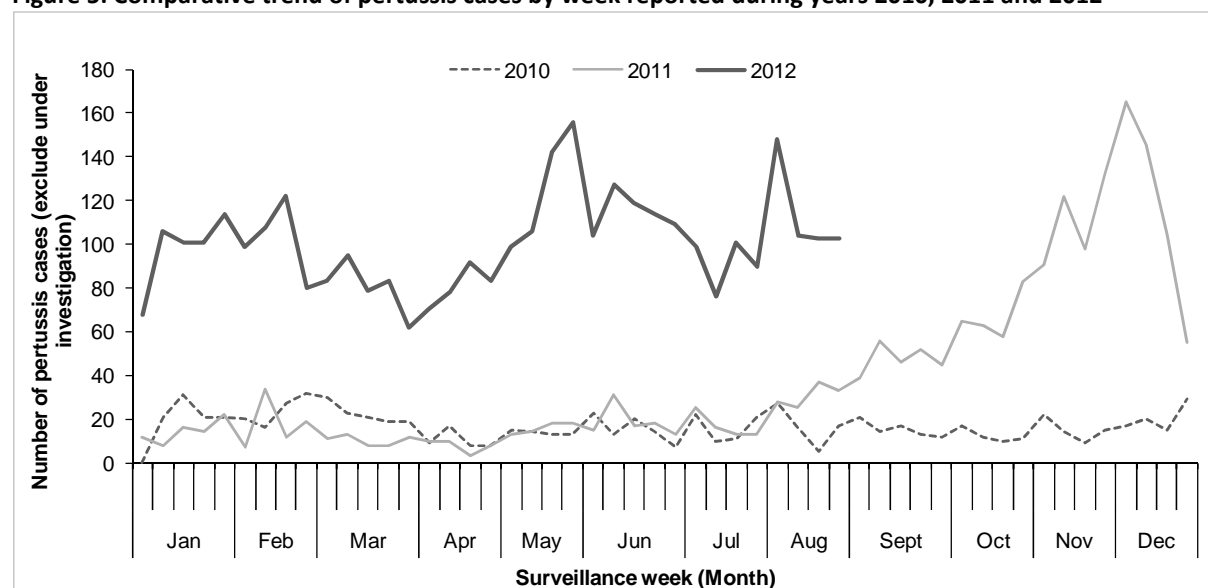
¹Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

²Cumulative notifications (excluding cases under investigation) since 31 December 2011

³Notifications between 18 August and 31 August 2012 inclusive

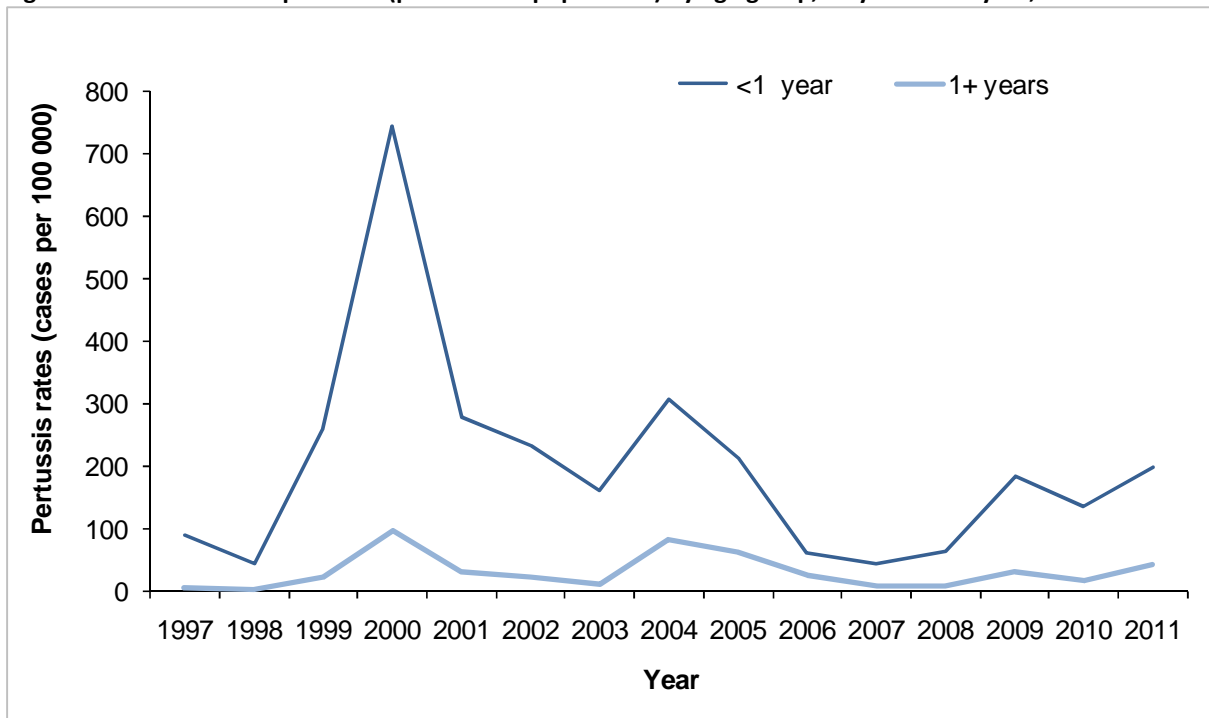
*Cases in the less than 1 year age group

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



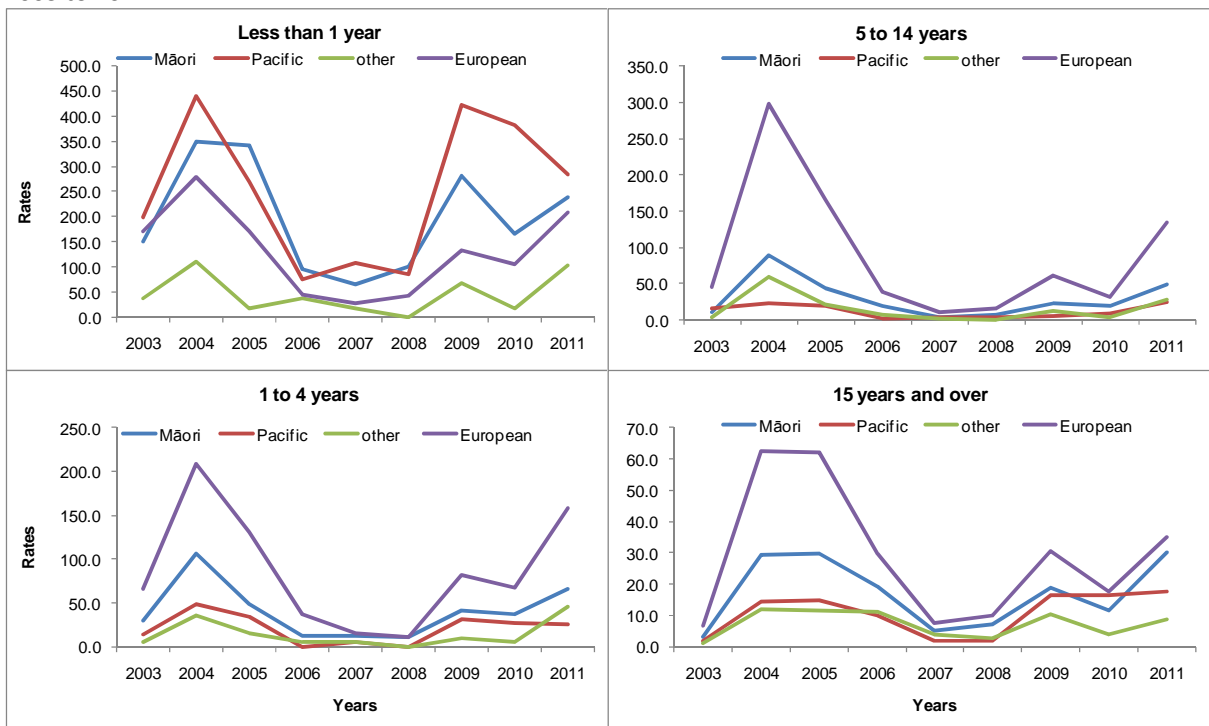
Note: Includes confirmed, probable and suspect cases only.

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

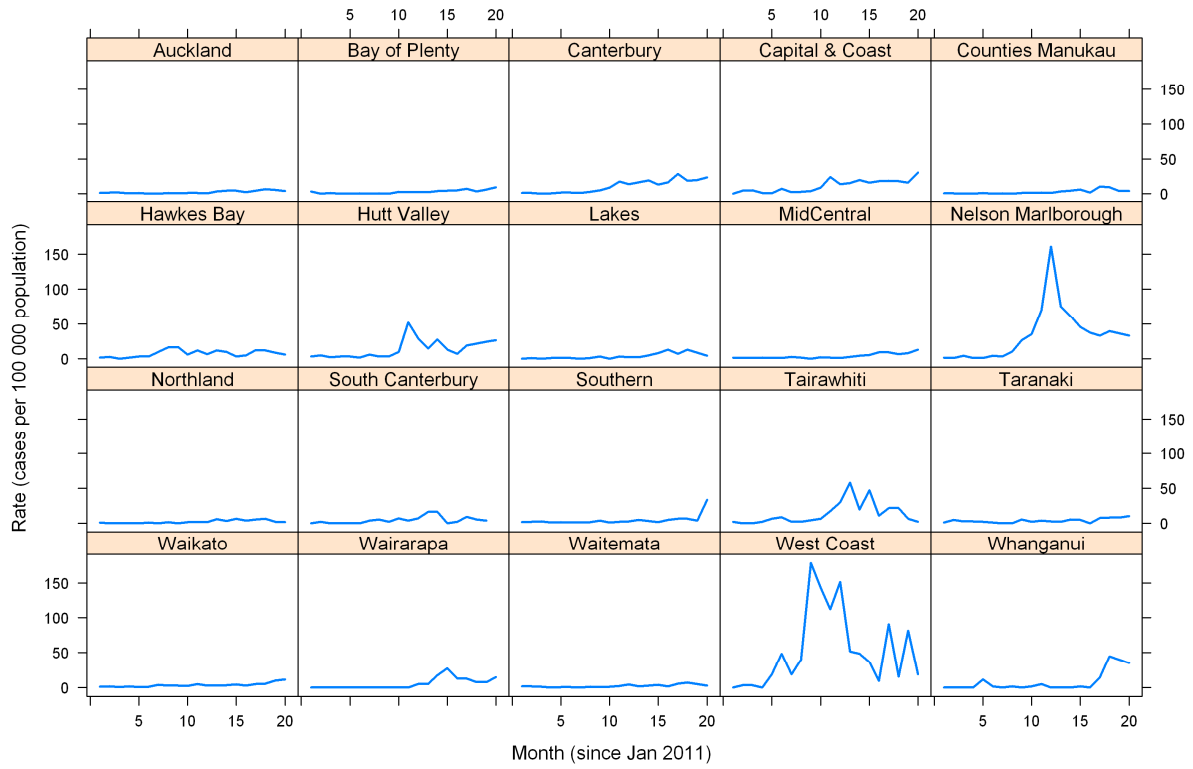
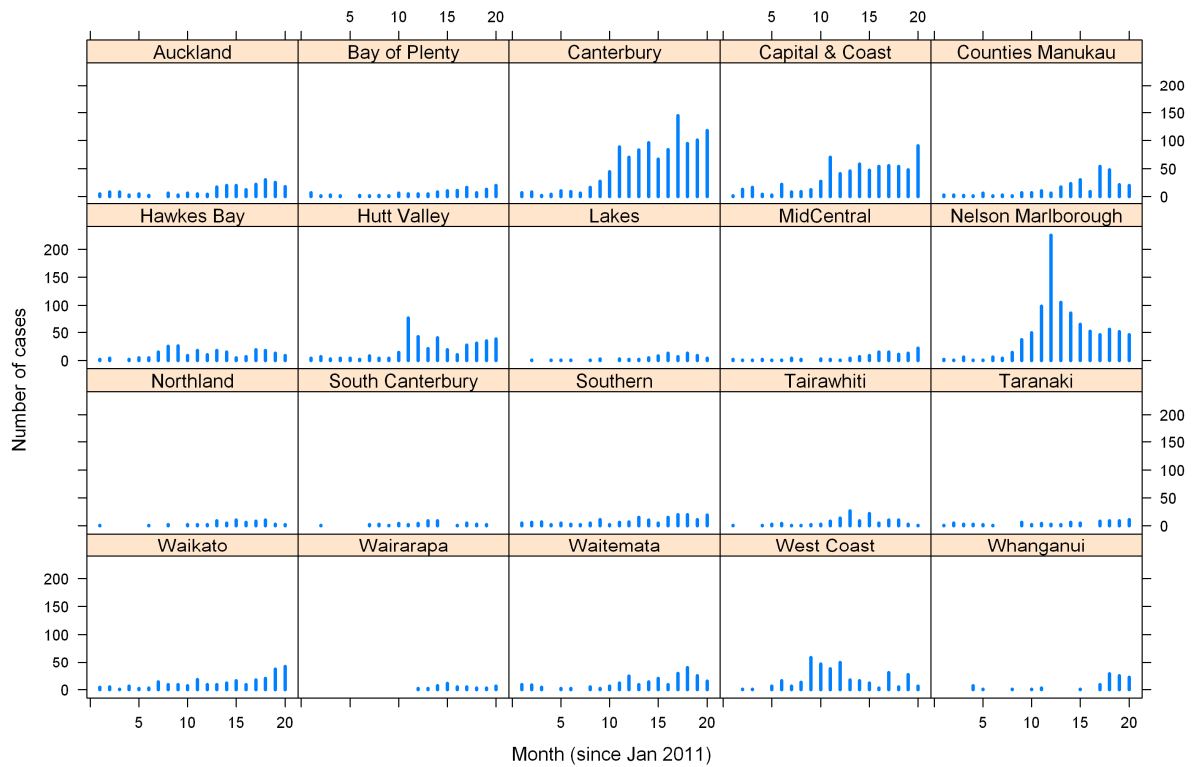


Figure 9: Monthly pertussis cases by DHB, since January 2011



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

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

Confirmed	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.
Probable	Cough lasting longer than two weeks and one or more of the following: <ul style="list-style-type: none"> • Paroxysmal cough • Cough ending in vomiting or apnoea • Inspiratory whoop for which there is no other known cause.
Suspect	In children under five years of age, any paroxysmal cough with whoop, vomiting or apnoea for which there is no other known cause.
Other	Status recorded as <i>under investigation</i> or suspect case.
Notifications	Include confirmed cases, probable, and other as specified above.

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

Confirmed	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.
Probable	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"> • Paroxysmal cough • Cough ending in vomiting or apnoea • Inspiratory whoop
Suspect	In children under five years of age any paroxysmal cough with whoop, vomiting or apnoea for which there is no other known cause.
Under investigation	A case that has been notified, but information is not yet available to classify it as suspect, probable or confirmed.
Notifications	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>.