

PERTUSSIS REPORT

This report includes cases of pertussis reported in EpiSurv up to midnight 14 September 2012. Data were extracted from EpiSurv at 10.00 am 18 September 2012.

Summary

In the past two surveillance weeks (1 September – 14 September 2012), 300 new cases of pertussis (133 and 167 cases, respectively) were notified, including 112 confirmed cases, 123 probable cases, 17 suspect cases, and 48 cases still under investigation. The numbers have increased slightly compared to the numbers reported over the previous two weeks (258 cases). Twenty-four (8.0%) of the notified cases were aged less than 1 year. Fifteen cases were hospitalised.

There has been a total of 3964 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 669 over the same period in 2011), including 1492 confirmed cases, 2147 probable cases, 174 suspect cases, and 151 cases still under investigation. 270 (6.8%) of the notified cases were in the less than 1 year age group. During this period, 186 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 (45 cases), and Waikato (23 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in West Coast (364.1 per 100 000, 120 cases), followed by Nelson Marlborough (354.5 per 100 000, 496 cases) and Tairāwhiti (191.0 per 100 000, 89 cases) DHBs. During this same period the highest number of notifications was reported from Canterbury DHB (833 cases), followed by Nelson Marlborough and Capital and Coast (496), Counties Manukau (229) and Hutt Valley (228) 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 14 September). 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 a decreasing trend in notifications through June and July 2012, followed by a general increase since the beginning of August. Weekly notifications had the highest spike (during week 37 ending 14 September 2012) 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

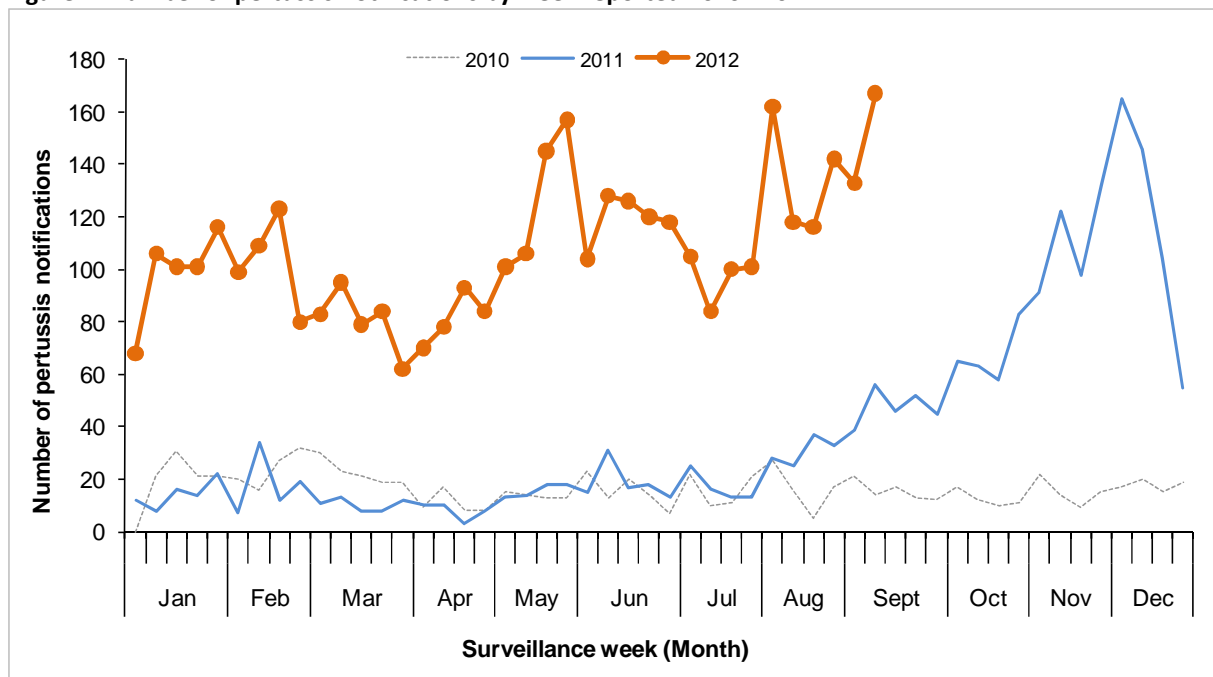
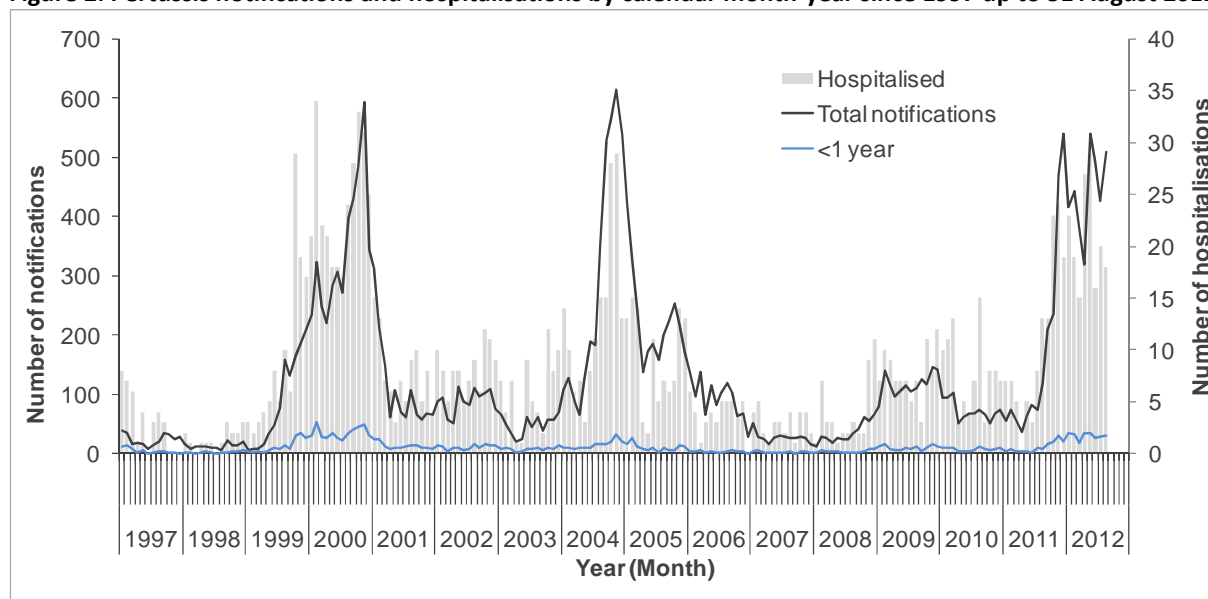


Figure 2 shows pertussis notifications and hospitalisations by year and calendar month, and notifications in the less than 1 year age group between 1 January 1997 and 31 August 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak 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 (413.7 per 100 000 population, 258 cases), followed by the 1 to 4 years (250.1 per 100 000, 630 cases), and 5 to 9 years (172.7 per 100 000, 496 cases) age groups.

Of the 3812 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	258	413.7	108	18	8
1 to 4	630	250.1	16	36	2
5 to 9	496	172.7	6	39	0
10 to 14	353	120.5	3	30	0
15 to 19	184	58.0	5	13	1
20 to 29	334	54.0	3	15	0
30 to 39	441	78.3	7	27	0
40 to 49	465	73.6	7	34	0
50 to 59	295	53.1	12	18	0
60 to 69	217	52.0	8	14	2
70+	139	34.2	6	7	0
Unknown	1		0	1	0
Overall	3813	86.6	181	252	13

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 1 September and 14 September 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 (174 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (106.3 per 100 000, 2863 cases), followed by Māori (89.2 per 100 000, 504 cases) and Pacific Peoples (61.0 per 100 000, 138 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. Māori had the highest 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 ² notifications			Last two weeks ³		
	All cases (Rate ¹)	<1 year (Rate ¹)	Hosp (% ⁴)	New Cases	<1 year	Hosp
Māori	504 (89.2)	80 (570.2)	59 (11.7)	28	8	5
Pacific Peoples	138 (61.0)	28 (546.8)	30 (21.7)	11	0	1
Other	149 (39.8)	10 (190.4)	7 (4.7)	14	0	0
European	2863 (106.3)	134 (451.1)	85 (3.0)	174	7	7
Unknown	159	6	0	25	3	0
Overall	3813 (94.7)	258	181	252	18	13

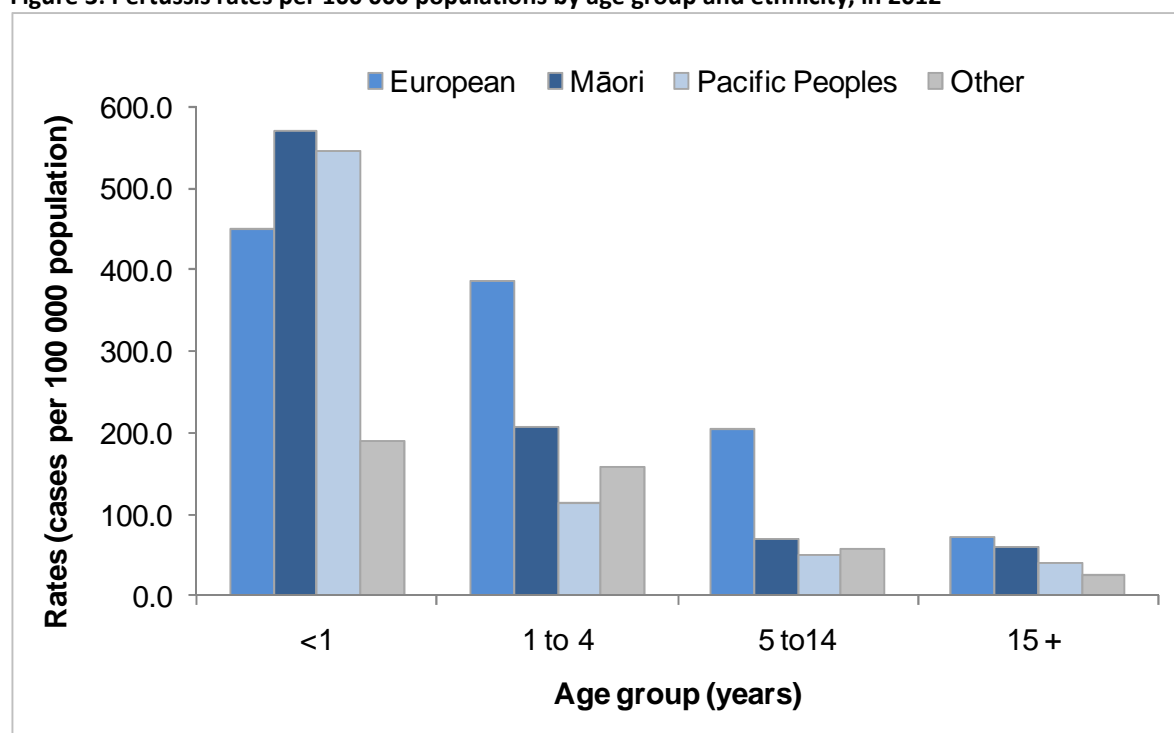
¹Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

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

³Notifications between 1 September and 14 September 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.

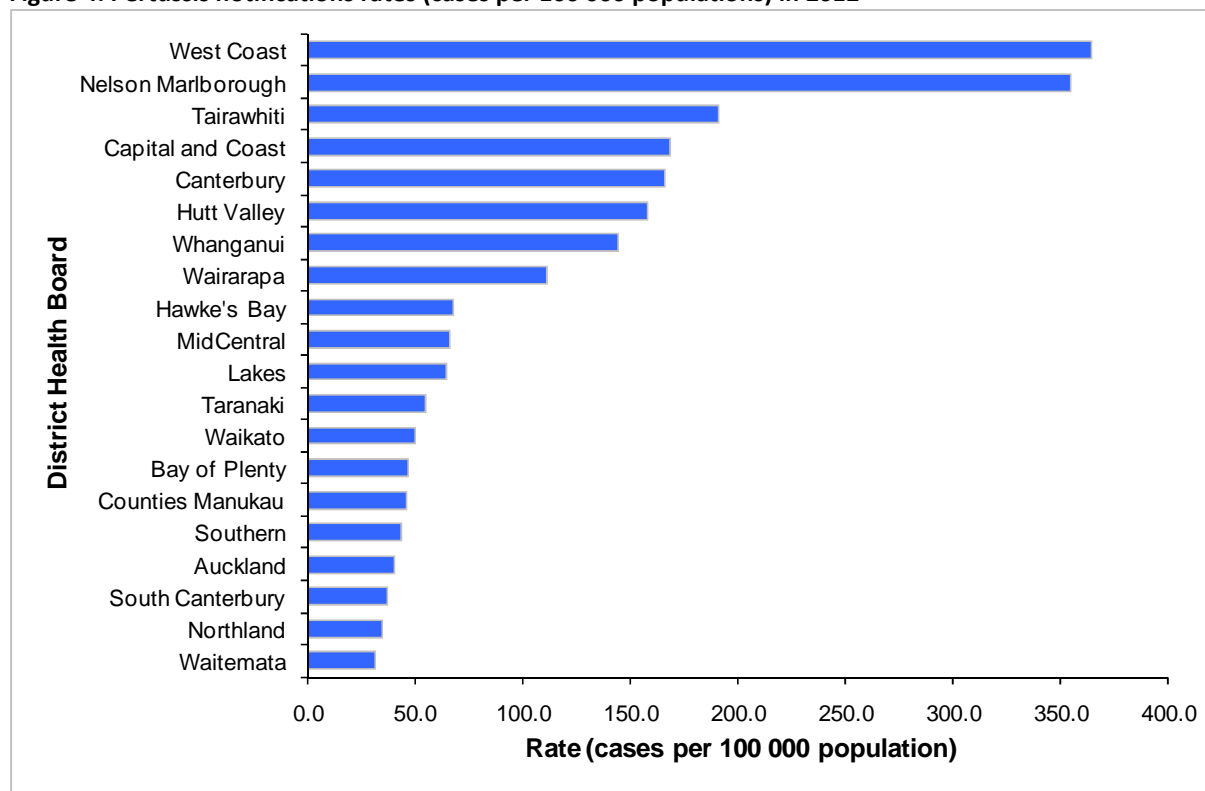
Hospitalisations

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, 13 hospitalisations were recorded. There have been 181 hospitalisations reported in EpiSurv in 2012. One hundred and eight (59.7%) of these were infants aged less than one year including 25 cases aged less than six weeks. Of the 3336 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (23.3%, 30/129), Māori (12.8%, 59/460), Other (5.2%, 7/135), and European (3.3%, 85/2612).

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 (45 cases) and Waikato (23 cases) DHBs. The highest cumulative rate in 2012 was recorded in West Coast (364.1 per 100 000, 120 cases), followed by Nelson Marlborough (354.5 per 100 000, 496 cases) and Tairāwhiti (191.0 per 100 000, 89 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (833 cases), followed by Nelson Marlborough and Capital and Coast (496 cases each), Counties Manukau (229) and Hutt Valley (228) 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 112 confirmed cases reported in the last two weeks, 74 (66.1%) had a known vaccination status. Of these 74 cases, 28 were not vaccinated. Six cases had received one dose of vaccine, four cases had received two doses, 10 cases had received three doses, 10 cases had received four doses, and five cases reported having completed pertussis vaccination. A further 11 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 14 September)

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	6	3	0	0	0	0	0	3	0
3-4 mths	1	0	1	0	0	0	0	0	0
5mths - 3yrs	23	1	2	5	0	0	1	9	5
4 - 10yrs	37	1	0	5	7	4	3	10	7
11+ yrs	45	1	1	0	3	1	7	6	26
Unknown	0	0	0	0	0	0	0	0	0
Total	112	6	4	10	10	5	11	28	38

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 1492 confirmed cases with known age reported during 2012, 996 (66.8%) had a known vaccination status (Table 4). Of these 996 cases, 335 were not vaccinated, including 12 cases aged less than 6 weeks and thus not eligible for vaccination. Eighty-three cases had received one dose of vaccine, 26 cases had received two doses, 141 cases had received three doses, 137 cases had received four doses, and 87 cases reported having completed pertussis vaccination. A further 187 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	48	27	1	0	0	0	0	16	4
3-4 mths	25	6	10	0	0	0	0	8	1
5mths - 3yrs	264	4	9	105	29	1	15	76	25
4 - 10yrs	382	8	3	24	90	57	49	110	41
11+ yrs	759	38	3	12	18	29	123	113	423
Unknown	14	0	0	0	0	0	0	12	2
Total	1492	83	26	141	137	87	187	335	496

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	55	34.8	5	4	2	0	1
Waitemata	171	31.3	14	15	9	0	0
Auckland	182	39.9	13	15	14	1	1
Counties Manukau	229	45.8	35	35	7	1	0
Waikato	184	50.0	10	12	23	0	1
Lakes	66	64.1	11	7	5	2	2
Bay of Plenty	99	46.7	6	3	9	2	0
Tairāwhiti	89	191.0	10	1	2	1	0
Taranaki	60	54.6	5	5	10	1	1
Hawke's Bay	105	67.4	9	5	1	0	0
Whanganui	91	144.3	10	9	6	0	0
MidCentral	111	65.9	8	6	15	0	0
Hutt Valley	228	157.8	9	4	13	0	0
Capital and Coast	496	168.3	25	5	45	4	1
Wairarapa	45	110.9	4	7	3	0	0
Nelson Marlborough	496	354.5	28	7	10	0	0
West Coast	120	364.1	2	1	11	0	0
Canterbury	833	165.7	36	25	54	4	5
South Canterbury	21	37.2	0	2	0	0	0
Southern	132	43.1	18	13	13	2	1
Total	3813	86.6	258	181	252	18	13

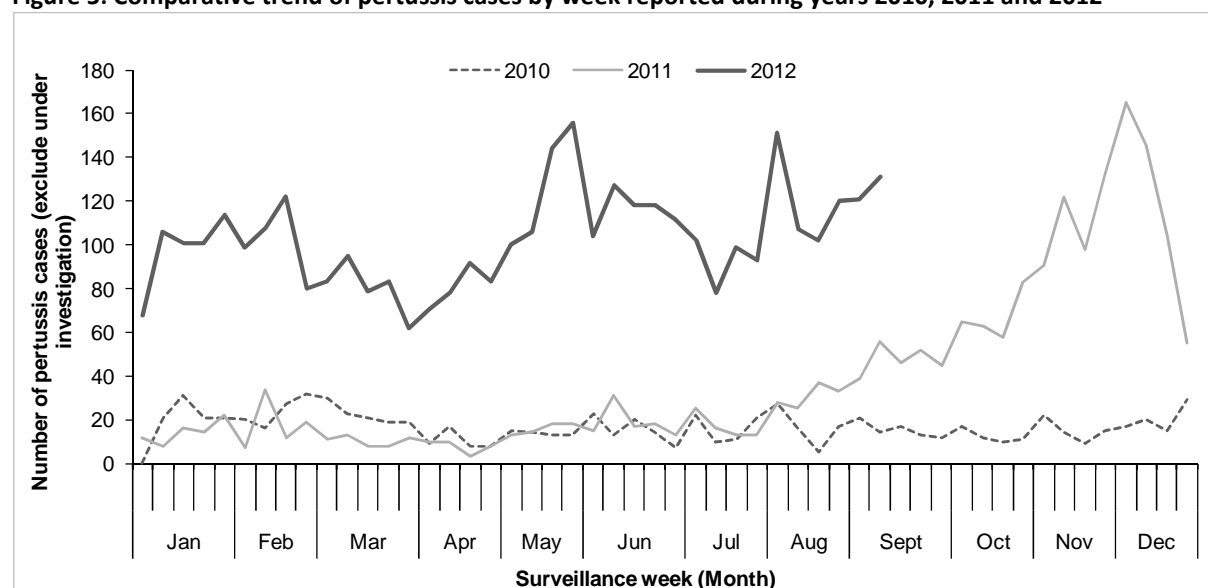
¹Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

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

³Notifications between 1 September and 14 September 2012 inclusive

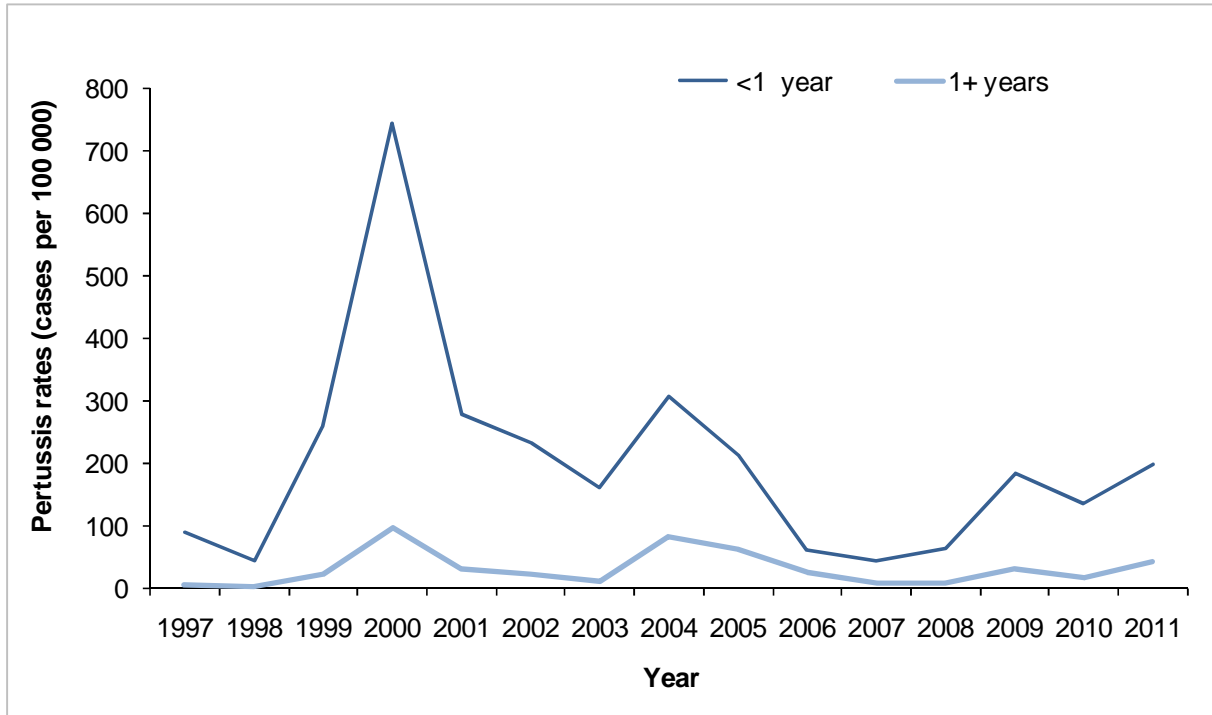
*Cases in the less than 1 year age group

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



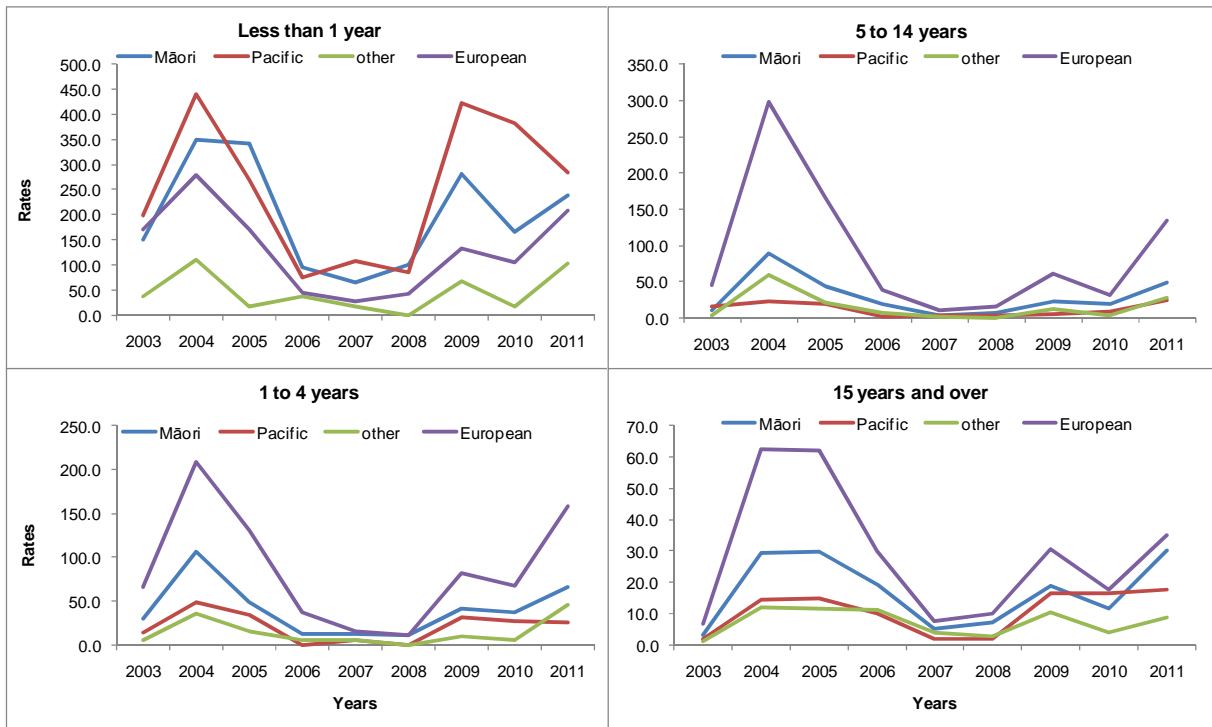
Note: Includes confirmed, probable and suspect cases only.

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

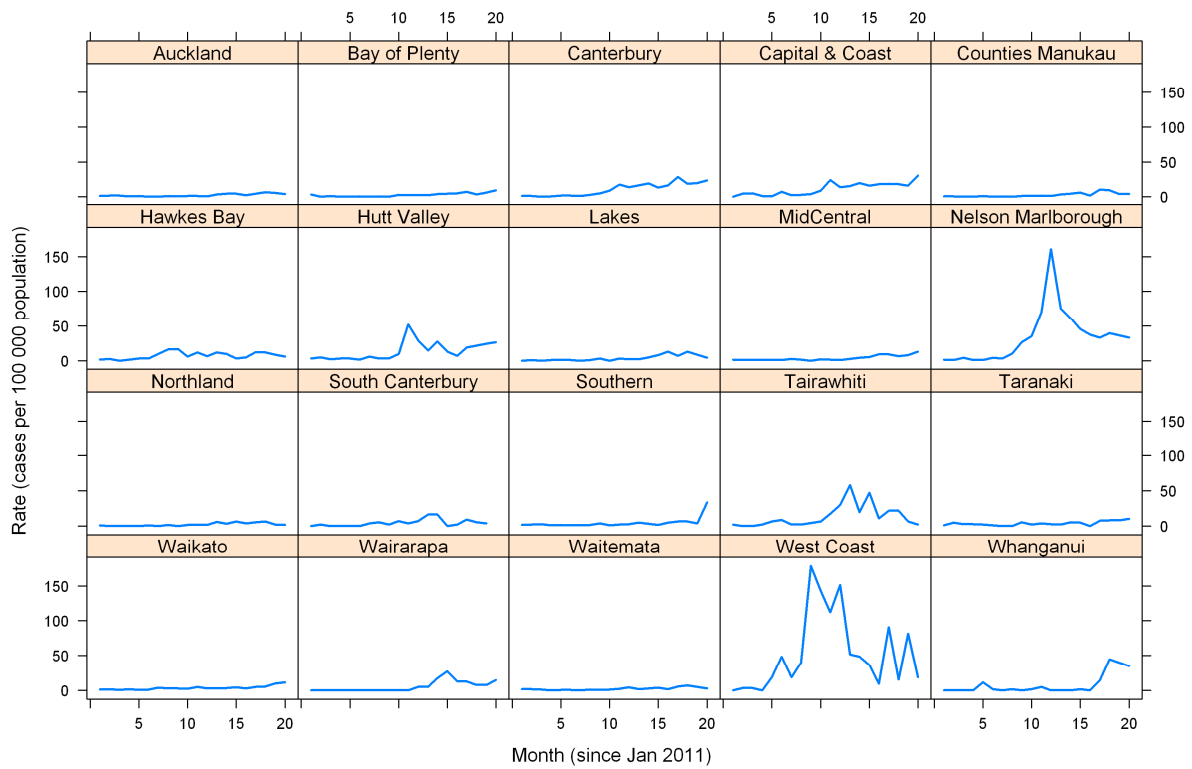
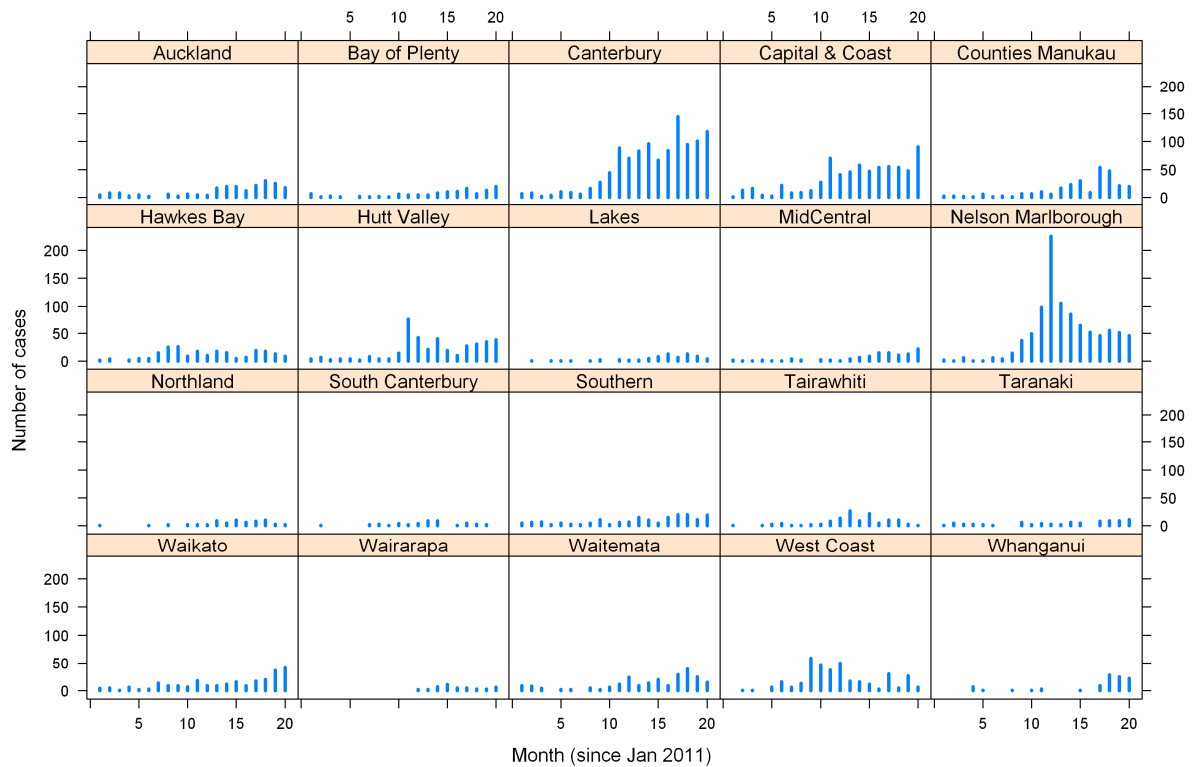


Figure 9: Monthly pertussis cases by DHB, since January 2011



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>.