

PERTUSSIS REPORT

This report includes cases of pertussis reported in EpiSurv up to midnight 12 October 2012. Data were extracted from EpiSurv at 10.00 am 16 October 2012.

Summary

In the past two surveillance weeks (29 September – 12 October 2012), 210 new cases of pertussis (120 and 90 cases, respectively) were notified, including 85 confirmed cases, 74 probable cases, 12 suspect cases, and 39 cases still under investigation. The numbers have decreased compared to the numbers reported over the previous two weeks (293 cases). Seventeen (8.1%) of the notified cases were aged less than 1 year. Twelve cases were hospitalised.

There has been a total of 4430 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 877 over the same period in 2011), including 1721 confirmed cases, 2362 probable cases, 220 suspect cases, and 127 cases still under investigation. 296 (6.7%) of the notified cases were in the less than 1 year age group. During this period, 213 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 (42 cases), Capital and Coast (24 cases), and Waikato (13 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (386.0 per 100 000, 540 cases), followed by West Coast (376.2 per 100 000, 124 cases) and Tairāwhiti (206.0 per 100 000, 96 cases) DHBs. During this same period the highest number of notifications was reported from Canterbury DHB (929 cases), followed by Capital and Coast (550) and Nelson Marlborough (540), Hutt Valley (255) and Counties Manukau (250) 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 12 October). 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 August and September 2012, followed by a general decrease since the beginning of October. Weekly notifications had the highest spike (during week 37) 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

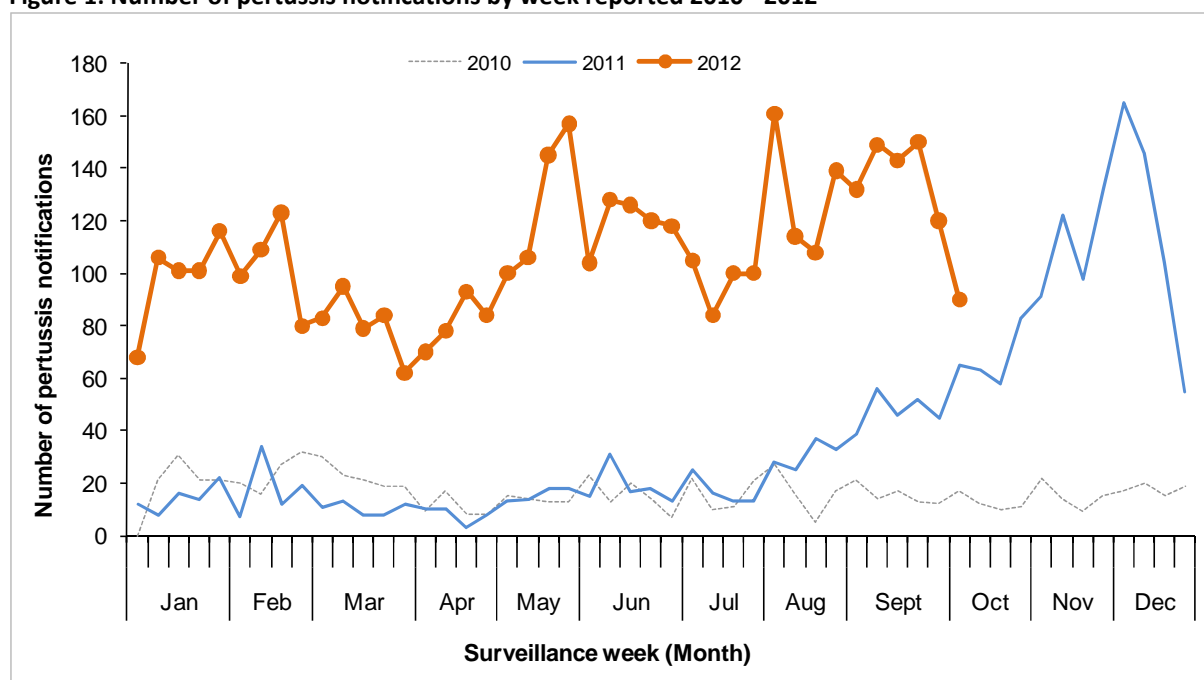
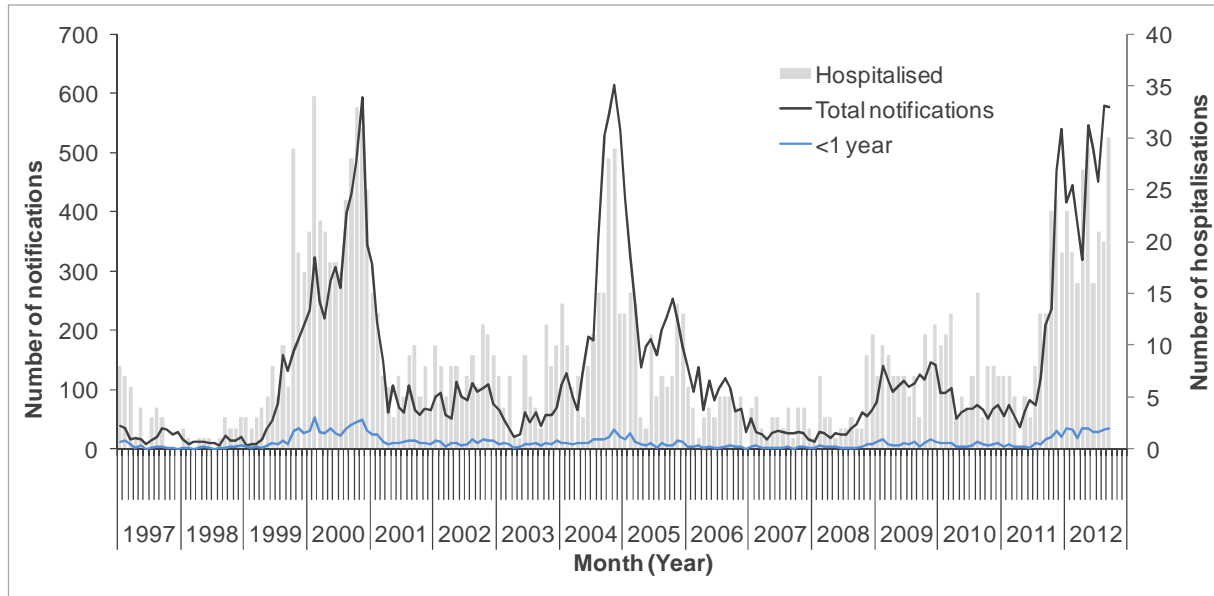


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 30 September 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. 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 30 September 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 (458.6 per 100 000 population, 286 cases), followed by the 1 to 4 years (279.1 per 100 000, 703 cases), and 5 to 9 years (191.1 per 100 000, 549 cases) age groups.

Of the 4303 cumulative cases with known age, 29 (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	286	458.6	124	13	6
1 to 4	703	279.1	19	20	1
5 to 9	549	191.1	8	23	2
10 to 14	401	136.9	3	11	0
15 to 19	216	68.1	5	11	0
20 to 29	378	61.1	3	15	0
30 to 39	496	88.1	8	24	0
40 to 49	542	85.8	10	27	0
50 to 59	333	59.9	12	14	0
60 to 69	244	58.5	8	10	0
70+	155	38.1	9	3	1
Unknown	0		0	0	0
Overall	4303	97.7	209	171	10

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 29 September and 12 October 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 (119 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (119.9 per 100 000, 3229 cases), followed by Māori (99.9 per 100 000, 565 cases) and Pacific Peoples (69.4 per 100 000, 157 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	565 (99.9)	88 (627.2)	67 (11.9)	23	4	4		
Pacific Peoples	157 (69.4)	30 (585.8)	35 (22.3)	4	2	1		
Other	159 (42.4)	11 (209.4)	7 (4.4)	7	1	0		
European	3229 (119.9)	151 (508.4)	98 (3.0)	119	6	4		
Unknown	193	6	2	18	0	1		
Overall	4303 (106.8)	286 (505.1)	209 (4.9)	171	13	10		

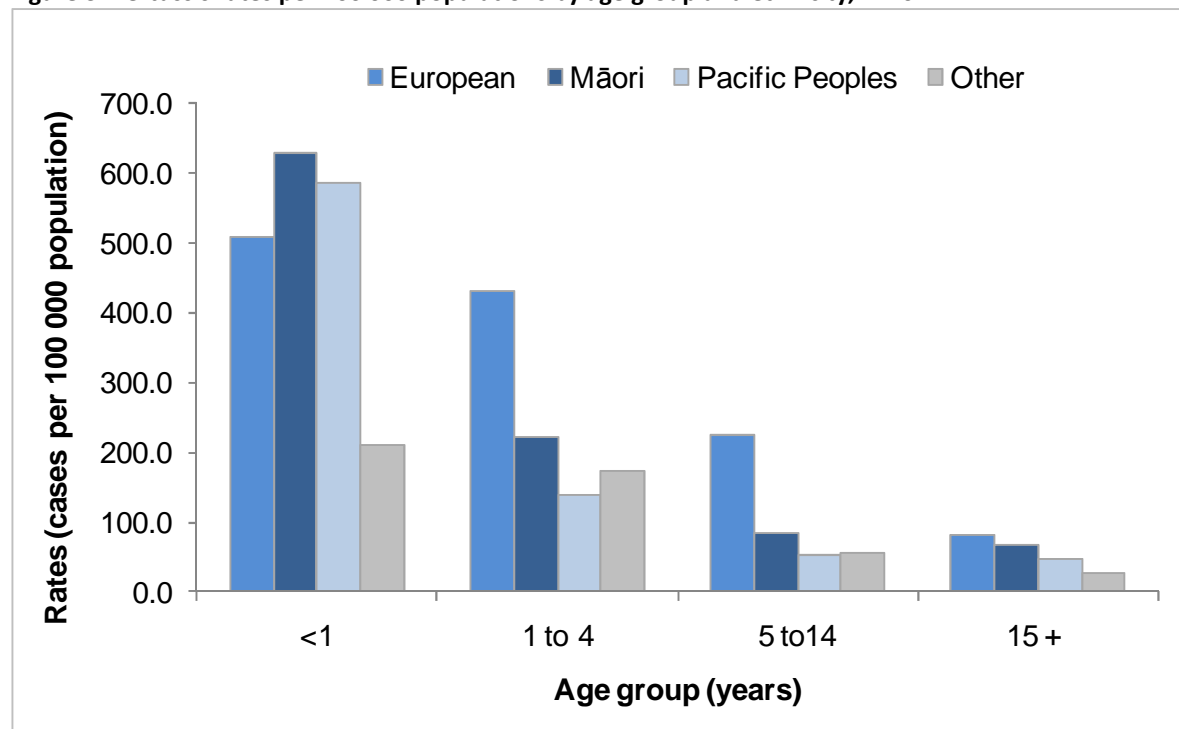
¹Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

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

³Notifications between 29 September and 12 October 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.

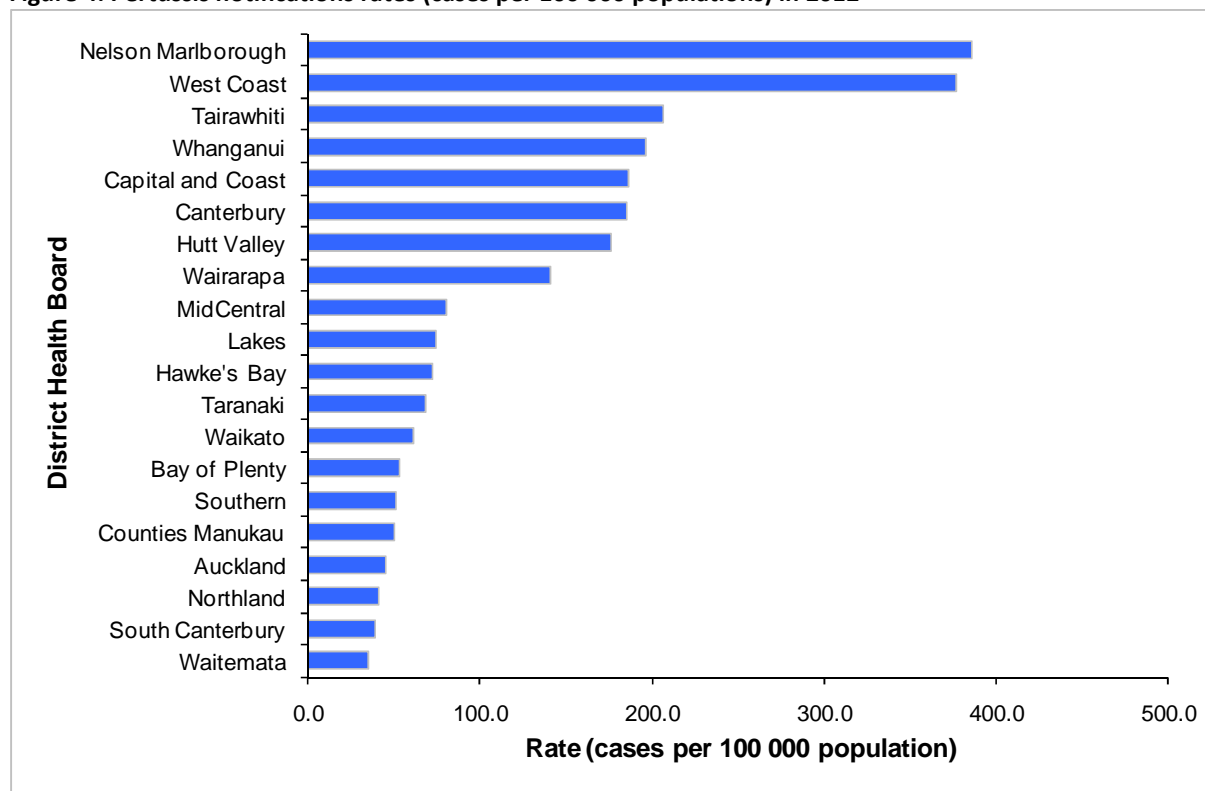
Hospitalisations

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, 10 hospitalisations were recorded. There have been 209 hospitalisations reported in EpiSurv in 2012. One hundred and twenty four (59.3%) of these were infants aged less than one year including 28 cases aged less than six weeks. Of the 3785 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (23.8%, 35/147), Māori (12.9%, 67/518), Other (4.9%, 7/143), and European (3.3%, 98/2977).

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 (42 cases), Capital and Coast (24 cases) and Waikato (13 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (386.0 per 100 000, 540 cases), followed by West Coast (376.2 per 100 000, 124 cases) and Tairāwhiti (206.0 per 100 000, 96 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (929 cases), followed by Capital and Coast (550), Nelson Marlborough (540), Hutt Valley (255) and Counties Manukau (250) 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 85 confirmed cases reported in the last two weeks, 50 (58.8%) had a known vaccination status. Of these 50 cases, 20 were not vaccinated. Three cases had received one dose of vaccine, seven cases had received three doses, five cases had received four doses, and two cases reported having completed pertussis vaccination. A further 13 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 12 October)

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	4	2	0	0	0	0	0	2	0
3-4 mths	1	0	0	0	0	0	0	1	0
5mths - 3yrs	14	0	0	7	0	0	1	4	2
4 - 10yrs	20	0	0	0	5	2	5	5	3
11+ yrs	46	1	0	0	0	0	7	8	30
Unknown	0	0	0	0	0	0	0	0	0
Total	85	3	0	7	5	2	13	20	35

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 1721 confirmed cases with known age reported during 2012, 1148 (66.7%) had a known vaccination status (Table 4). Of these 1148 cases, 397 were not vaccinated, including 16 cases aged less than 6 weeks and thus not eligible for vaccination. Ninety-three cases had received one dose of vaccine, 28 cases had received two doses, 156 cases had received three doses, 152 cases had received four doses, and 95 cases reported having completed pertussis vaccination. A further 227 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	16	0	0	0	0	0	0	13	3
6wks - 2mths	57	31	1	0	0	0	1	20	4
3-4 mths	28	6	11	0	0	0	0	10	1
5mths - 3yrs	290	4	9	118	29	1	18	84	27
4 - 10yrs	433	8	3	25	103	61	61	131	41
11+ yrs	897	44	4	13	20	33	147	139	497
Unknown	0	0	0	0	0	0	0	0	0
Total	1721	93	28	156	152	95	227	397	573

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	65	41.1	5	4	4	0	0
Waitemata	191	35.0	15	16	6	0	0
Auckland	205	44.9	17	21	6	2	2
Counties Manukau	250	50.0	35	39	11	0	2
Waikato	225	61.2	13	13	13	2	0
Lakes	77	74.8	13	9	3	1	1
Bay of Plenty	113	53.3	6	3	4	0	0
Tairāwhiti	96	206.0	12	3	4	1	1
Taranaki	75	68.3	5	6	3	0	0
Hawke's Bay	112	71.9	10	6	3	0	0
Whanganui	124	196.6	14	11	8	2	1
MidCentral	136	80.8	8	6	5	0	0
Hutt Valley	255	176.5	10	3	10	1	0
Capital and Coast	550	186.7	27	8	24	2	1
Wairarapa	57	140.5	5	10	6	1	2
Nelson Marlborough	540	386.0	30	7	9	0	0
West Coast	124	376.2	3	1	1	0	0
Canterbury	929	184.8	38	26	42	1	0
South Canterbury	22	39.0	0	2	1	0	0
Southern	157	51.2	20	15	8	0	0
Total	4303	97.7	286	209	171	13	10

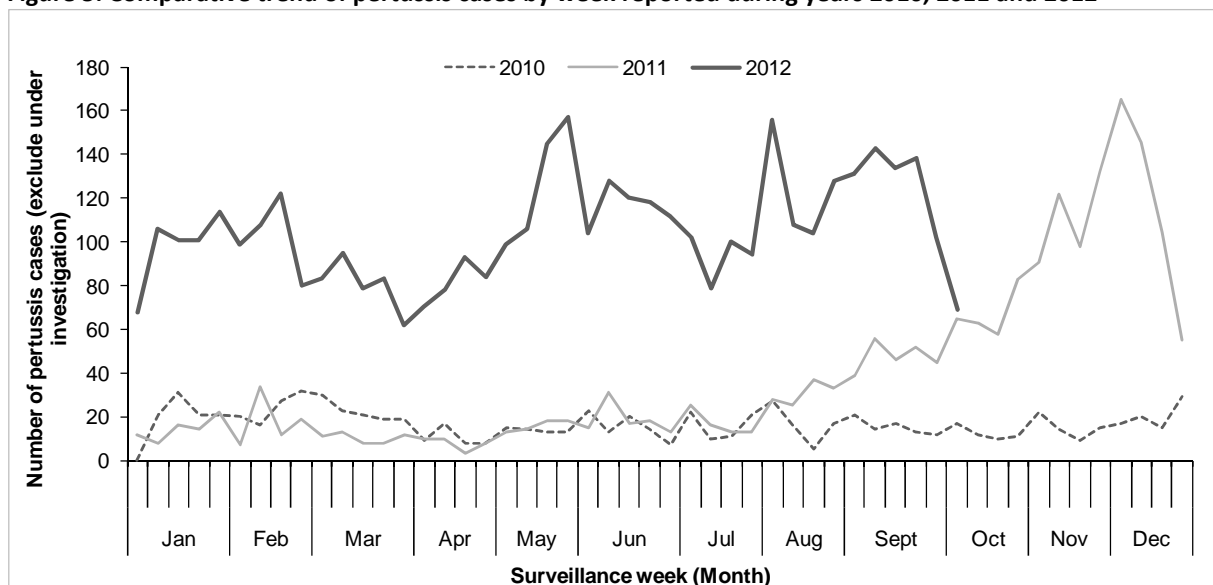
¹Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

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

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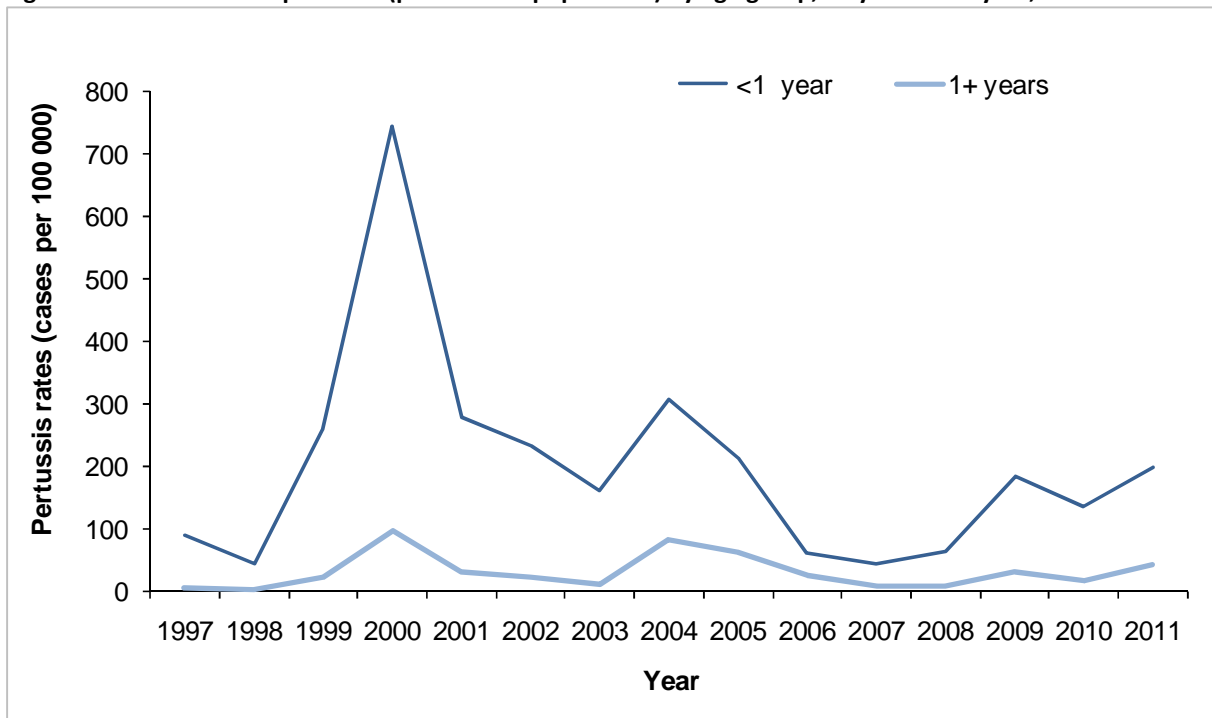
*Cases in the less than 1 year age group

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



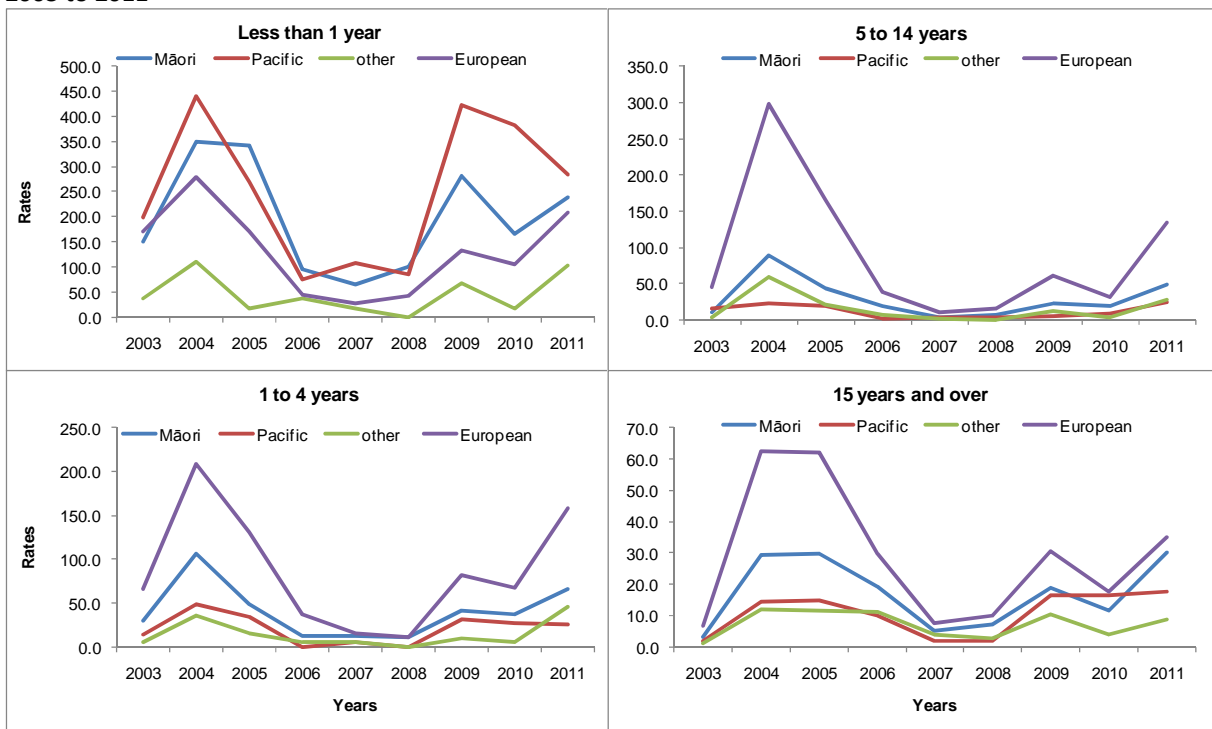
Note: Includes confirmed, probable and suspect cases only.

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

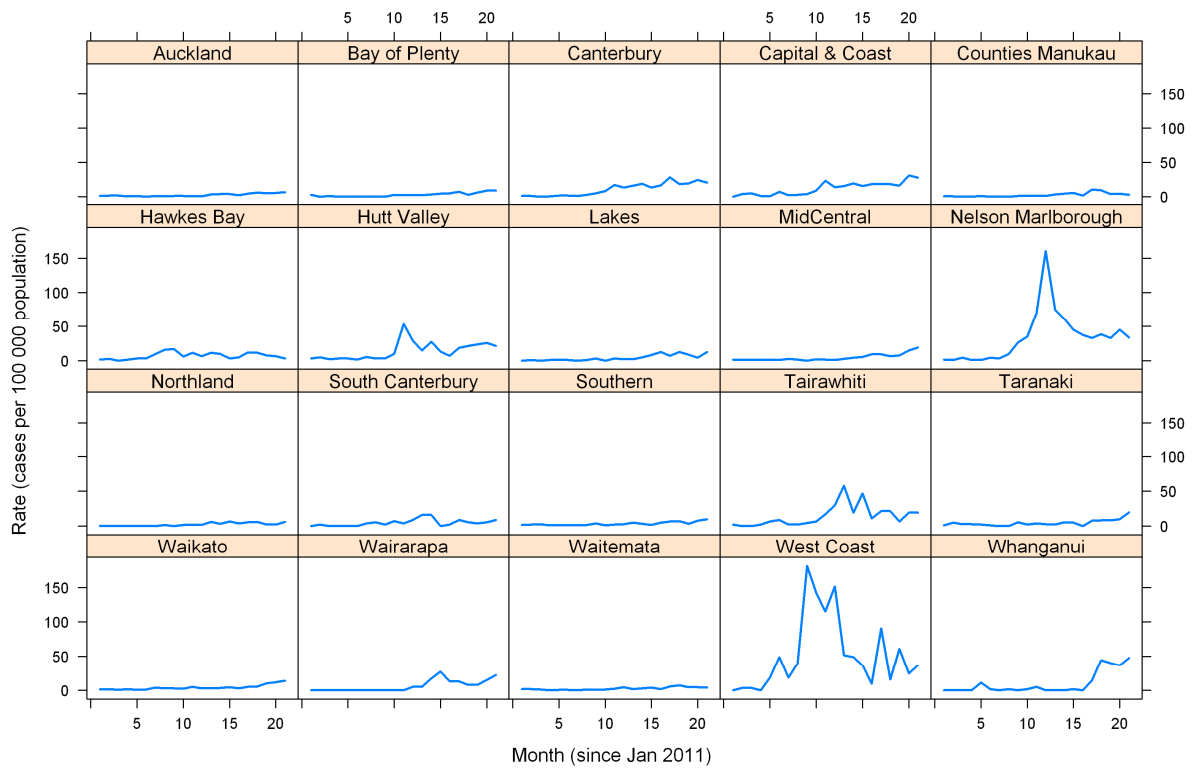
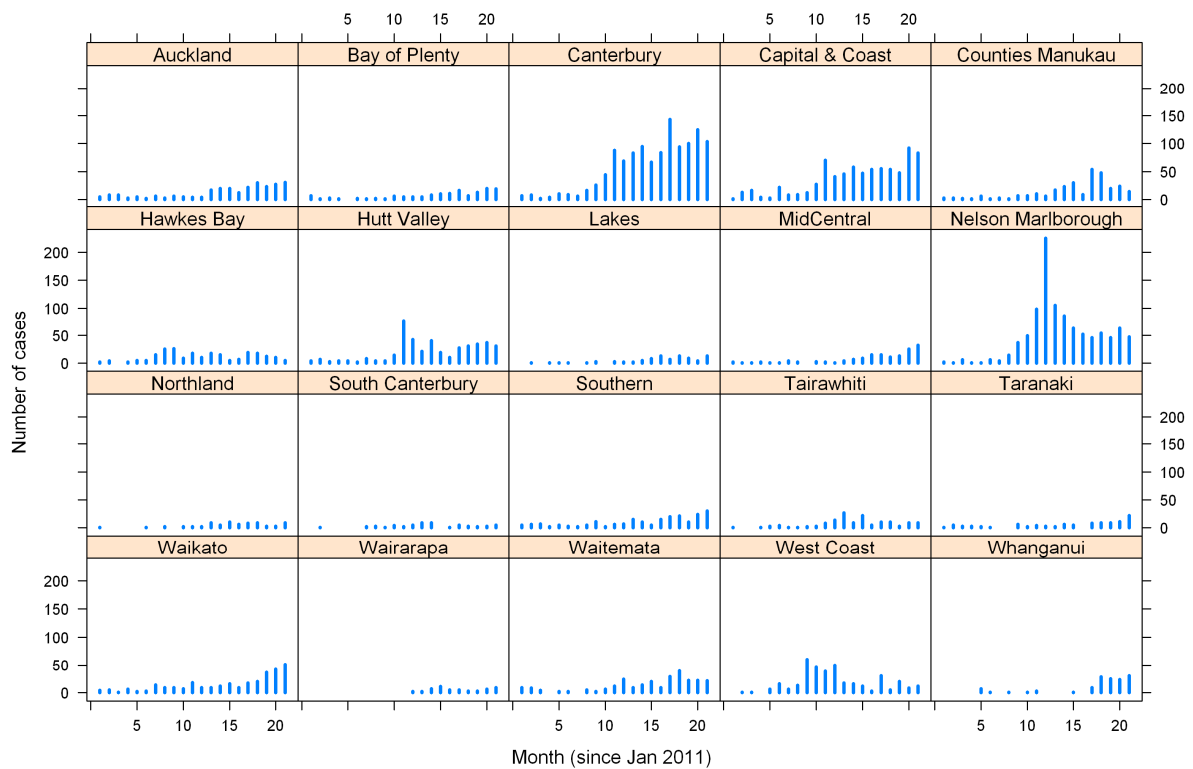


Figure 9: Monthly pertussis cases by DHB, since January 2011



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>.