



PERTUSSIS REPORT

Apr - Jun 2013

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service (PHS) staff as at 4 July 2013. Changes made to EpiSurv data after this date will not be reflected in this report. The results presented may be further updated and should be regarded as provisional.

Summary

In the second quarter of 2013 (April to June 2013), 780 new cases of pertussis were notified, including 303 confirmed cases, 364 probable cases, 40 suspect cases and 73 cases still under investigation. Less cases were reported in the last quarter compared to the numbers reported over the previous quarter (January to March 2013, 1359 cases). Fifty-five (7.1%) of the notified cases were aged less than 1 year. Highest rates were seen in the youngest age groups (0-9 years). Thirty-four cases were hospitalised and no deaths were reported.

High numbers in the last quarter (excluding cases under investigation) were reported from Nelson Marlborough and Canterbury (103 cases each), Southern (65 cases), Waikato (56 cases), Capital and Coast (54 cases), and Auckland (53 cases) DHBs. Highest rates in the last quarter were recorded in Nelson Marlborough (73.2 per 100 000, 103 cases), followed by Northland (24.0 per 100 000, 38 cases), Hutt Valley (23.6 per 100 000, 34 cases), Southern (21.1 per 100 000, 65 cases), and MidCentral (20.7 per 100 000, 35 cases) DHBs. The overall quarterly rate was 15.9 per 100 000 with 707 cases.

In June 211 cases of pertussis were notified, including 58 confirmed cases, 93 probable cases, 13 suspect cases, and 47 cases still under investigation. The number of cases in June has declined compared to the previous month (299 cases). Eighteen (8.5%) of the notified cases were aged less than 1 year. Nine cases were hospitalised and no deaths were reported.

High numbers of cases (excluding cases under investigation) in June 2013 were reported from Nelson Marlborough (35 cases), Canterbury (25 cases), Southern (20 cases), Capital and Coast (18 cases), and Waikato (12 cases) DHBs. Highest rates were recorded in Nelson Marlborough (24.9 per 100 000, 35 cases), followed by Southern (6.5 per 100 000, 20 cases), Capital and Coast (6.1 per 100 000, 18 cases), Hutt Valley (5.5 per 100 000, 8 cases) and Northland (5.1 per 100 000, 8 cases) DHBs. The overall June rate was 3.7 per 100 000 with 164 cases.

This report summarises pertussis notifications for 2013 (quarterly and a monthly summary). It 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 on the last page. 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, 2012 and 2013 (to week ending 28 June). While notifications for the second quarter in 2013 have fallen below those seen in 2012, they still remain well above 2010 and 2011 levels. Since week 34 in 2011 (ending 26 August) notifications have been increasing more or less consistently. The highest weekly notification count occurred during week 51 of 2012. 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, 2012 and 2013. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition.

Figure 1: Number of pertussis notifications by week reported, 2010 - 2013

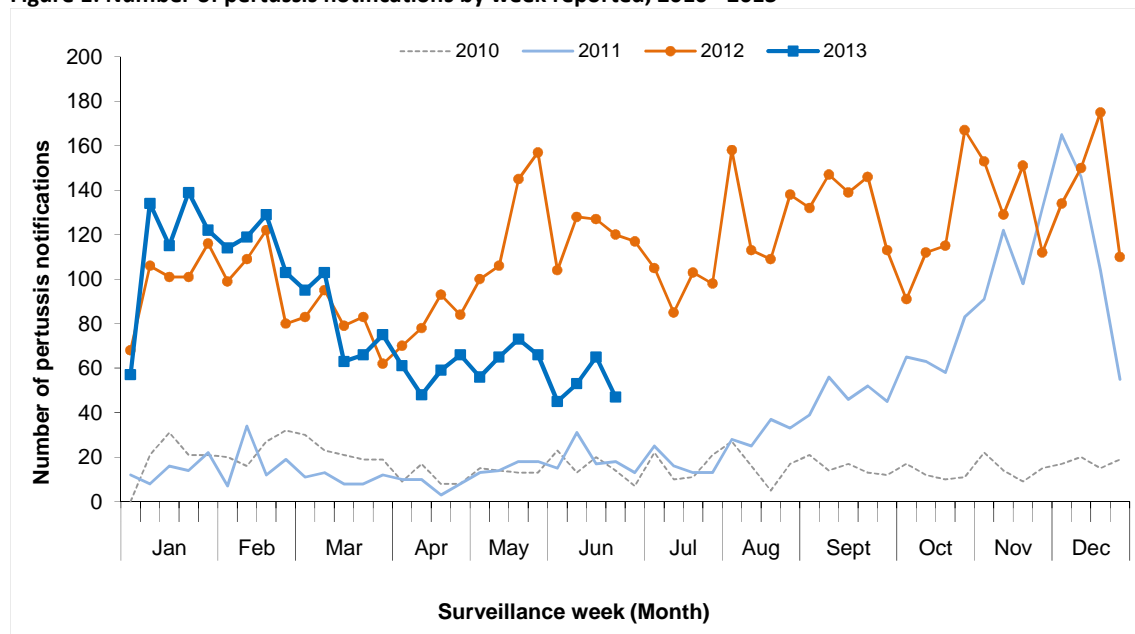
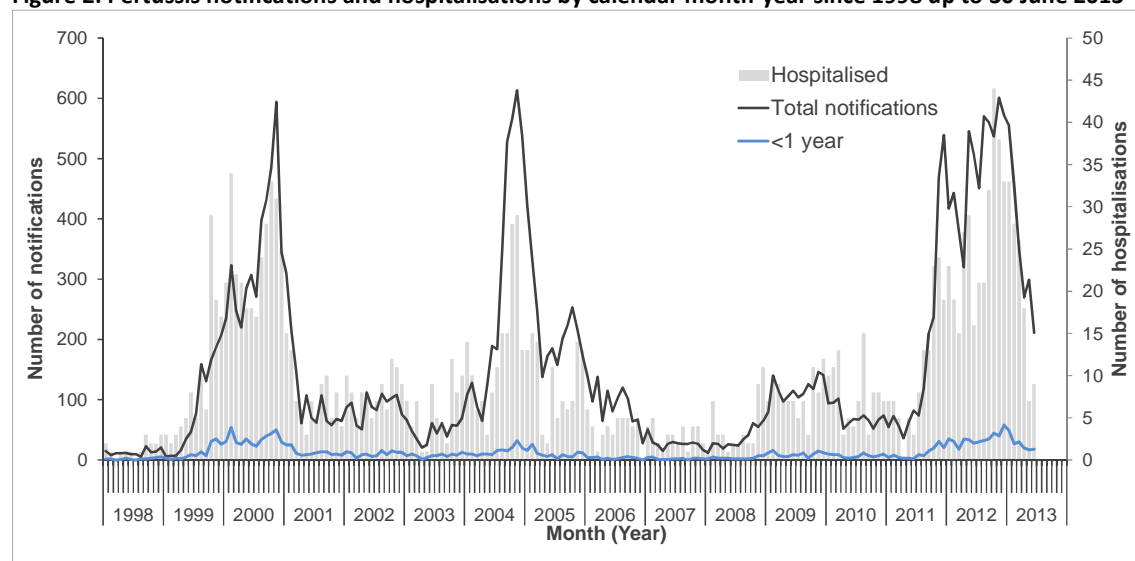


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1998 and 30 June 2013. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, notifications had been rising again since August 2011 followed by a decreasing trend which has been seen since the start of 2013. 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 during the period 1997-2012

Figure 2: Pertussis notifications and hospitalisations by calendar month-year since 1998 up to 30 June 2013

In the following pages 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 June. Pertussis rates varied across age groups. Of the cases reported in the second quarter in 2013, infants aged less than one year had the highest rate (77.6 per 100 000 population, 47 cases), followed by the 1 to 4 years (43.8 per 100 000 population, 110 cases), and 5 to 9 years (26.4 per 100 000 population, 77 cases) age groups.

Of the 707 cases in the second quarter in 2013, 10 (1.4%) were infants under 6 weeks of age. Figure 3 shows the cumulative notification rate of pertussis cases by age group and ethnicity in 2013.

Table 1: Pertussis cases and rates by age group in Quarter two: Apr-Jun and June 2013

Age group (Years)	Quarter two: Apr-Jun 2013			June 2013	
	All cases	Rates ¹	Hosp	New Cases	Hosp
<1	47	77.6	22	13	5
1 to 4	110	43.8	0	27	0
5 to 9	77	26.4	2	15	1
10 to 14	33	11.4	0	9	0
15 to 19	28	9.0	2	6	1
20 to 29	80	12.7	1	17	1
30 to 39	88	15.8	0	21	0
40 to 49	106	16.9	5	27	1
50 to 59	61	10.7	0	10	0
60 to 69	47	11.0	1	14	0
70+	30	7.1	0	5	0
Unknown	0	-	0	0	0
Overall	707	16.0	33	164	9

¹Rate of pertussis cases per 100 000 population calculated using 2012 mid-year population estimates.

Hosp: hospitalisation counts

Ethnicity

Pertussis cases and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European group had the highest numbers reported in June 2013 (118 cases). Of the cases in the second quarter in 2013, the ethnic-specific cumulative rates were highest for the European or Other ethnic group (16.0 per 100 000, 493 cases), followed by Māori (14.4 per 100 000, 93 cases) and Pacific Peoples (12.4 per 100 000, 33 cases). Figure 3 shows the European or Other ethnic group having the highest notification rates across all age groups except the under 1 year age group. Pacific Peoples had the highest notification rates in this age group, followed by European or Other.

Table 2: Pertussis cases and rates by ethnicity (prioritised) in Quarter two: Apr-Jun and June 2013

Ethnicity	Quarter two: Apr-Jun 2013						Jun 2013		
	All cases (Rates ¹)	Hosp ³ (% ²)	<1 year ⁴ (Rates ¹)	New Cases	Hosp ³	<1 year ⁴			
Maori	93 (14.4)	8 (8.6)	11 (67.4)	23	2	3			
Pacific Peoples	33 (12.4)	5 (15.2)	6 (97.8)	4	0	0			
Asian	15 (3.7)	0 -	0 -	3	0	0			
MELAA	2 -	0 -	0 -	0	0	0			
European or Other	493 (16.0)	18 (3.7)	27 (84.2)	118	6	9			
Unknown	71 -	2 -	0 -	16	1	1			
Overall	707 (15.9)	31 (4.4)	44 (72.6)	164	9	13			

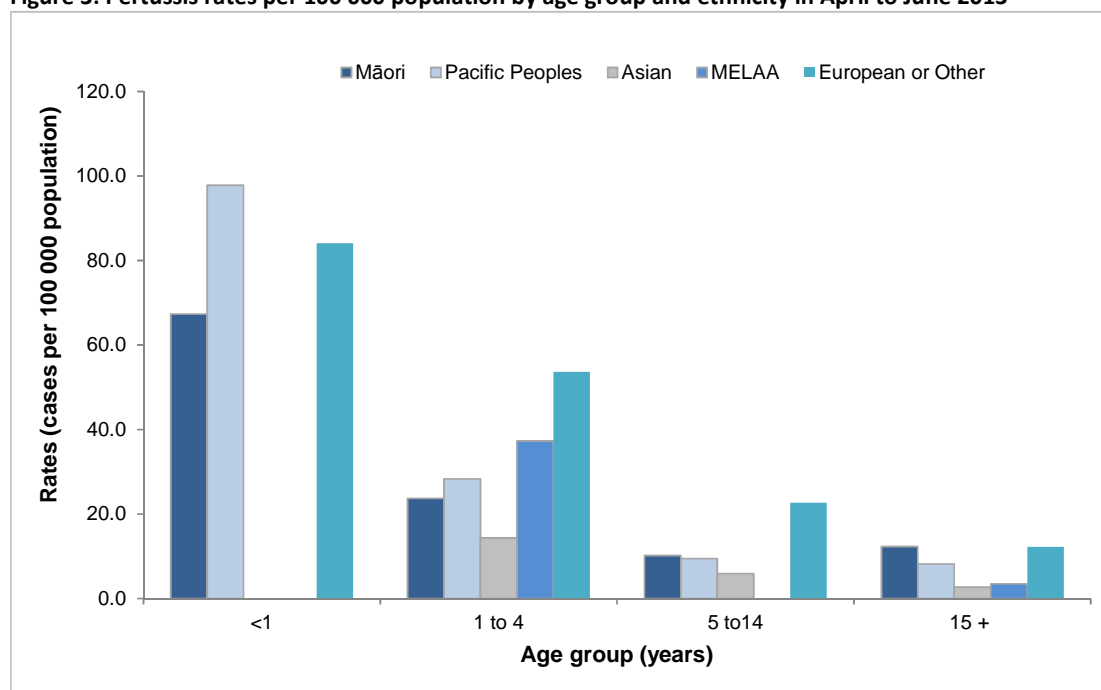
¹Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

²Percentage of hospitalised notifications by ethnic group

³Number of hospitalised notifications by ethnic group

⁴Cases in the less than 1 year age group

Figure 3: Pertussis rates per 100 000 population by age group and ethnicity in April to June 2013



Note: Denominator data used to determine rates are based on the proportion of people in each ethnic group from the estimated resident 2006 census population applied to the 2012 mid-year population estimates from Statistics New Zealand.

Figure 7 (appendix) shows the trend of cumulative pertussis notification rates (per 100 000 population) by age group and ethnicity for years 2003 to 2012. 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 high in the European ethnic group. Rates are for all notifications.

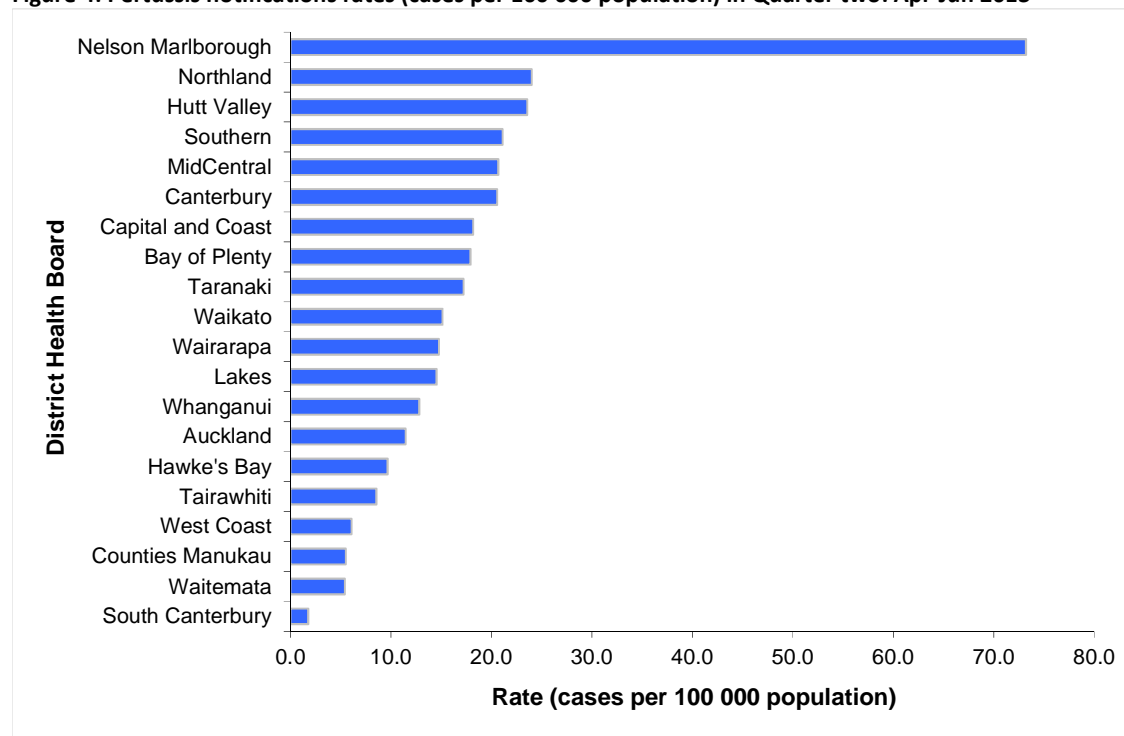
Hospitalisations and Deaths

The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5, respectively. In June, nine hospitalisations were recorded. There have been 33 hospitalisations reported in EpiSurv in the second quarter of 2013. Twenty-two (66.7%) of these were infants aged less than one year including six cases aged less than six weeks. Of the 602 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (15.6%, 5/32), Māori (9.2%, 8/87), and European or Other (3.9%, 18/466). No hospitalisations were reported for the Asian or MELAA ethnic groups. No deaths have been reported in the second quarter of 2013.

Geographic distribution

The rates of pertussis notifications by DHB can be seen in Figure 4 (and Table 5 in appendix). In June, the highest number of cases was reported in Nelson Marlborough (35 cases), Canterbury (25 cases), Southern (20 cases), and Capital and Coast (18 cases) DHBs. The highest rates in the second quarter of 2013 were recorded in Nelson Marlborough (73.2 per 100 000, 103 cases), followed by Northland (24.0 per 100 000, 38 cases), Hutt Valley (23.6 per 100 000, 34 cases), Southern (21.1 per 100 000, 65 cases), and MidCentral (20.7 per 100 000, 35 cases) DHBs. The highest number of notifications was reported from Canterbury and Nelson Marlborough (103 cases each), Southern (65 cases), Waikato (56 cases), and Capital and Coast (54 cases) DHBs. Cases in the under 1 year age group by DHB are shown in Table 5 (appendix). 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 population) in Quarter two: Apr-Jun 2013



Note: Cumulative rates were calculated using 2012 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 June and the second quarter in 2013, respectively. Of the 58 confirmed cases reported in June, 34 (58.6%) had a known vaccination status. Of these 34 cases, 16 were not vaccinated. Two cases had received one dose of vaccine, five cases had received three doses, and six cases had received four doses. A further five cases reported being vaccinated but no dose information was available.

Table 3: Immunisation status of confirmed pertussis cases notified in June 2013

Age Group	Total cases	Vaccinated							Not vaccinated	Unknown
		One dose	Two doses	Three doses	Four doses	Five doses	(no dose info)			
<6wks	2	0	0	0	0	0	0	2	0	
6wks - 2mths	4	2	0	0	0	0	0	2	0	
3-4 mths	0	0	0	0	0	0	0	0	0	
5mths - 3yrs	8	0	0	5	0	0	0	2	1	
4 - 10yrs	14	0	0	0	5	0	1	2	6	
11+ yrs	30	0	0	0	1	0	4	8	17	
Unknown	0	0	0	0	0	0	0	0	0	
Total	58	2	0	5	6	0	5	16	24	

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 303 confirmed cases with known age reported during the second quarter of 2013, 188 (62.1%) had a known vaccination status (Table 4). Of these 188 cases, 81 were not vaccinated, including seven cases aged less than 6 weeks and thus not eligible for vaccination. Thirteen cases had received one dose of vaccine, three cases had received two doses, 31 cases had received three doses, 24 cases had received four doses, and six cases reported having completed pertussis vaccination. A further 30 cases reported being vaccinated but no dose information was available.

Table 4: Immunisation status of confirmed pertussis cases notified in April to June 2013

Age Group	Total cases	Vaccinated							Not vaccinated	Unknown
		One dose	Two doses	Three doses	Four doses	Five doses	(no dose info)			
<6wks	7	0	0	0	0	0	0	7	0	
6wks - 2mths	11	5	0	0	0	0	0	6	0	
3-4 mths	3	2	1	0	0	0	0	0	0	
5mths - 3yrs	50	1	1	25	2	1	4	14	2	
4 - 10yrs	70	0	0	4	18	2	6	25	15	
11+ yrs	162	5	1	2	4	3	20	29	98	
Unknown	0	0	0	0	0	0	0	0	0	
Total	303	13	3	31	24	6	30	81	115	

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

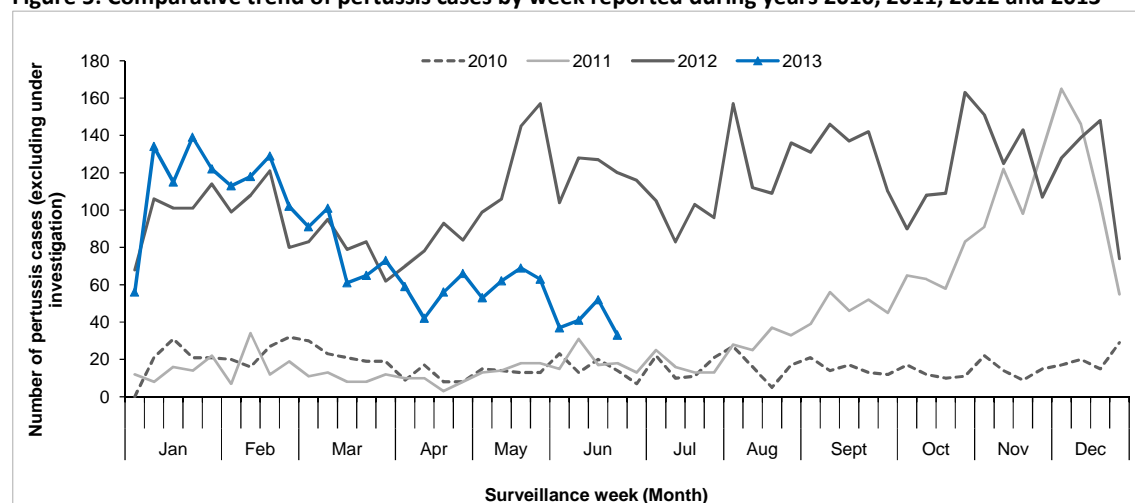
Table 5: Pertussis cases and rates by DHB in Quarter two: Apr-Jun and June 2013

DHB	Quarter two: Apr-Jun 2013				June 2013		
	All cases	Rates ¹	Hosp	<1 year ²	New Cases	Hosp	<1 year ²
Northland	38	24.0	4	3	8	2	2
Waitemata	30	5.4	0	1	7	0	1
Auckland	53	11.5	4	2	8	1	0
Counties Manukau	28	5.5	6	6	4	0	0
Waikato	56	15.1	4	5	12	2	3
Lakes	15	14.5	4	2	2	1	0
Bay of Plenty	38	17.9	1	2	3	0	0
Tairāwhiti	4	8.5	0	0	0	0	0
Taranaki	19	17.2	0	1	4	0	0
Hawke's Bay	15	9.7	1	2	6	1	0
Whanganui	8	12.8	0	0	0	0	0
MidCentral	35	20.7	1	1	2	0	0
Hutt Valley	34	23.6	1	3	8	0	1
Capital and Coast	54	18.2	1	2	18	0	1
Wairarapa	6	14.8	0	0	2	0	0
Nelson Marlborough	103	73.2	2	8	35	0	3
West Coast	2	6.1	0	0	0	0	0
Canterbury	103	20.6	3	6	25	1	1
South Canterbury	1	1.8	0	0	0	0	0
Southern	65	21.1	1	3	20	1	1
Total	707	15.9	33	47	164	9	13

¹Rate of pertussis cases per 100 000 population calculated using 2012 mid-year population estimates.

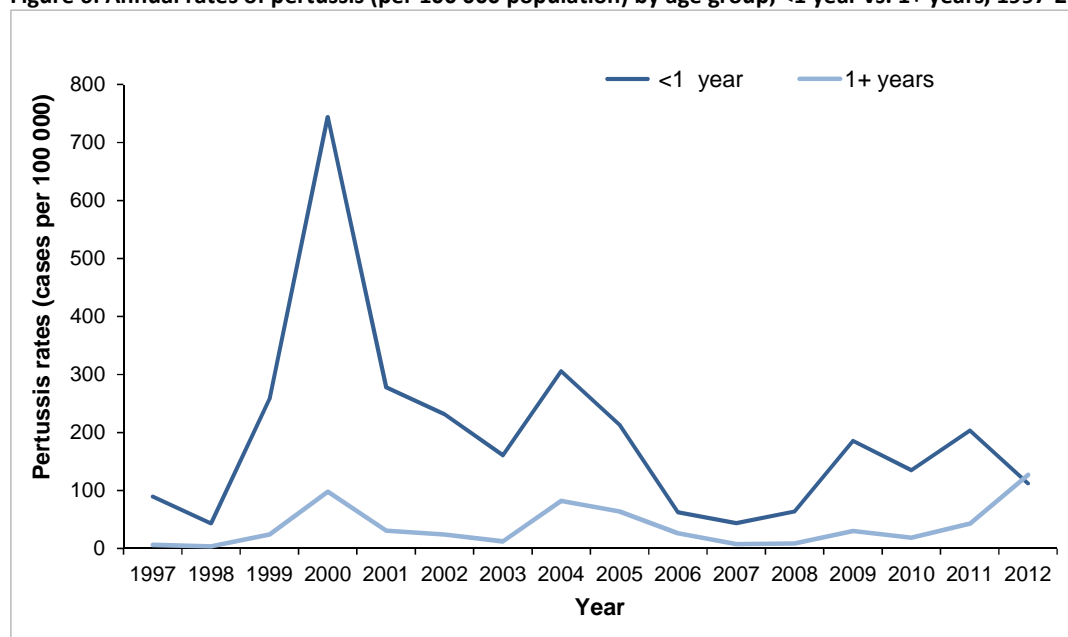
²Cases in the less than 1 year age group

Figure 5: Comparative trend of pertussis cases by week reported during years 2010, 2011, 2012 and 2013



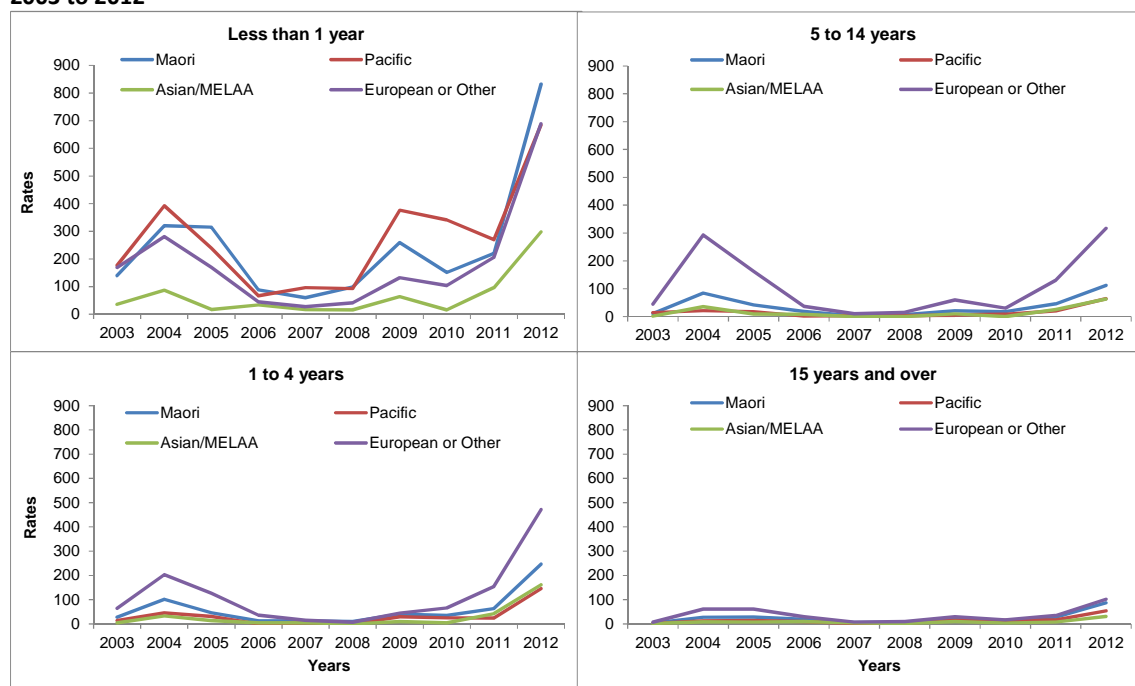
Note: Includes confirmed, probable and suspect cases only.

Figure 6: Annual rates of pertussis (per 100 000 population) by age group, <1 year vs. 1+ years, 1997-2012



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 2012



Note: Rate of pertussis notified cases per 100 000 population (includes cases under investigation) calculated using denominator data based on the proportion of people in each ethnic group from the estimated resident 2006 census population applied to the applicable mid-year population estimates from Statistics New Zealand

Figure 8: Monthly pertussis rates (cases per 100 000 population) by DHB, since January 2012

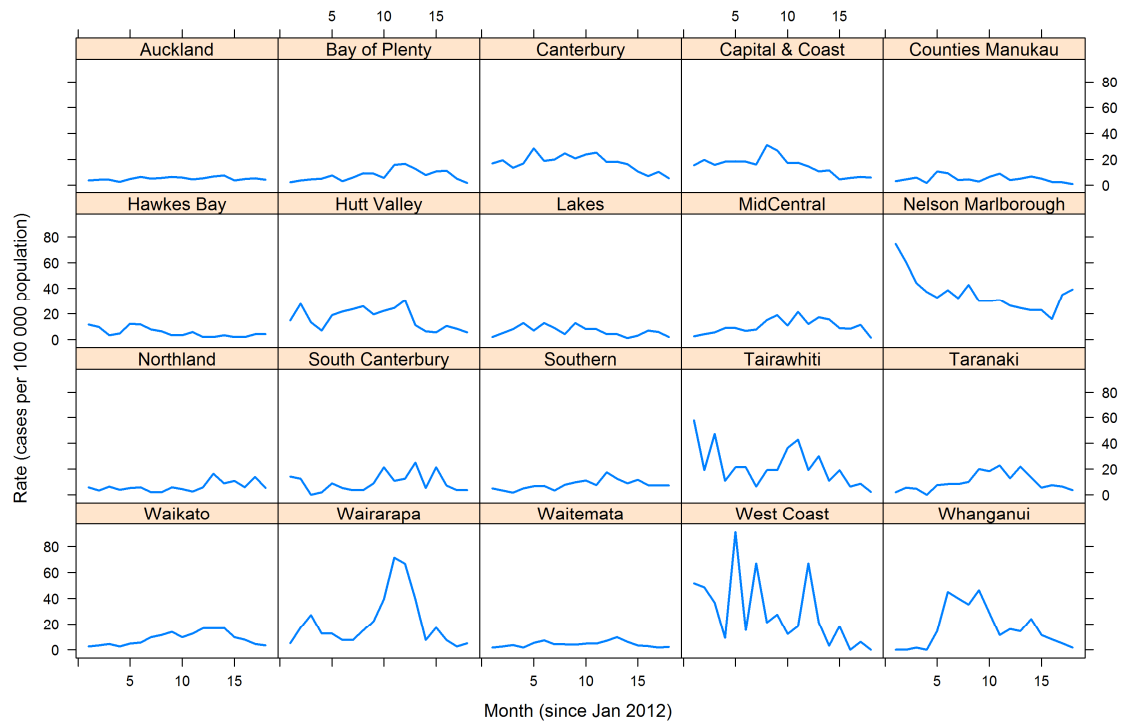
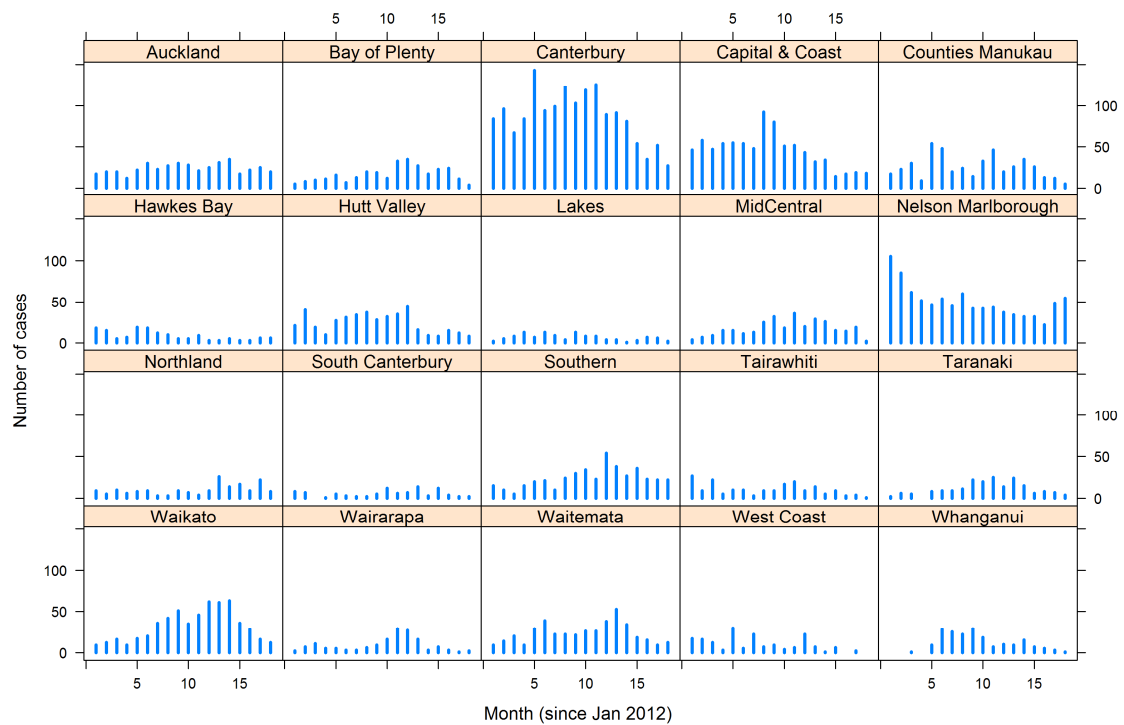


Figure 9: Monthly pertussis cases by DHB, since January 2012



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

Case classification for pertussis notification in New Zealand up to 30 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 is available at: <http://www.surv.esr.cri.nz/surveillance/PertussisRpt.php>.