

PERTUSSIS REPORT

Jan - Mar 2013

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service (PHS) staff as at 5 April 2013. Changes made to EpiSurv data after this date will not be reflected in this report. The report includes notifications for the current month and the first quarter in 2013. The results presented may be further updated and should be regarded as provisional.

Summary

In the first quarter in 2013 (January to March 2013), 1375 new cases of pertussis were notified, including 702 confirmed cases, 578 probable cases, 39 suspect cases and 56 cases still under investigation. More cases were reported in the last quarter compared to the numbers reported over the previous quarter (October to December 2012, 1240 cases). One-hundred and six (7.7%) of the notified cases were aged less than 1 year. Eighty-six cases were hospitalised and no deaths were reported.

High numbers in the last quarter (excluding cases under investigation) were reported from Canterbury (226 cases), Waikato (157 cases), Waitemata (102 cases), Southern (98 cases), and Nelson Marlborough (91 cases) DHBs. Highest rates in the last quarter were recorded in Nelson Marlborough (64.7 per 100 000, 91 cases), followed by Wairarapa (64.0 per 100 000, 26 cases), Tairāwhiti (59.8 per 100 000, 28 cases), Whanganui (49.6 per 100 000, 31 cases), and Canterbury (45.2 per 100 000, 226 cases) DHBs. The overall quarterly rate was 29.8 per 100 000 with 1319 cases.

In March 362 cases of pertussis were notified, including 140 confirmed cases, 164 probable cases, 16 suspect cases, and 42 cases still under investigation. The number of cases in March has declined compared to the previous month (455 cases). Thirty (8.3%) of the notified cases were aged less than 1 year. Twenty-six cases were hospitalised and no deaths were reported.

High numbers of cases (excluding cases under investigation) in March 2013 were reported from Canterbury (54 cases), Waikato (34 cases), Southern (33 cases), and Nelson Marlborough (31 cases) DHBs. Highest rates were recorded in Nelson Marlborough (22.0 per 100 000, 31 cases), followed by Tairāwhiti (19.2 per 100 000, 9 cases), West Coast (18.2 per 100 000, 6 cases), Wairarapa (17.2 per 100 000, 7 cases) and Whanganui (11.2 per 100 000, 7 cases) DHBs. The overall March rate was 7.2 per 100 000 with 320 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 29 March). Notifications for the first quarter in 2013 have followed a similar trend seen in 2012 remaining well above 2010 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

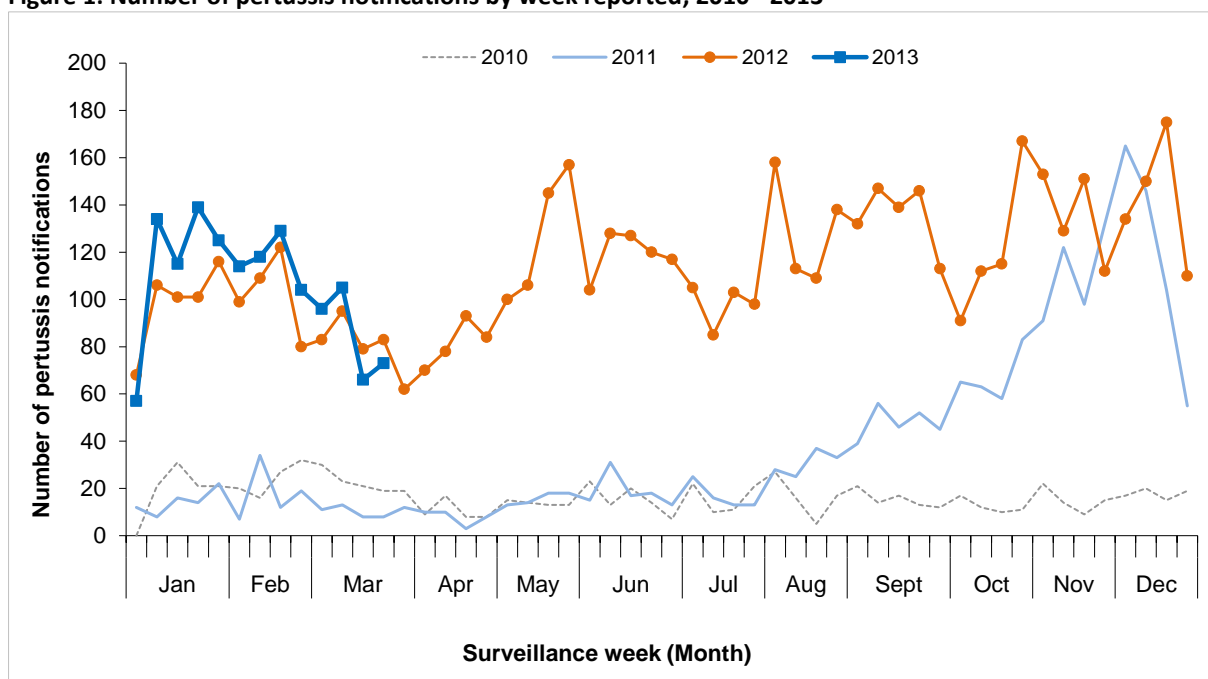
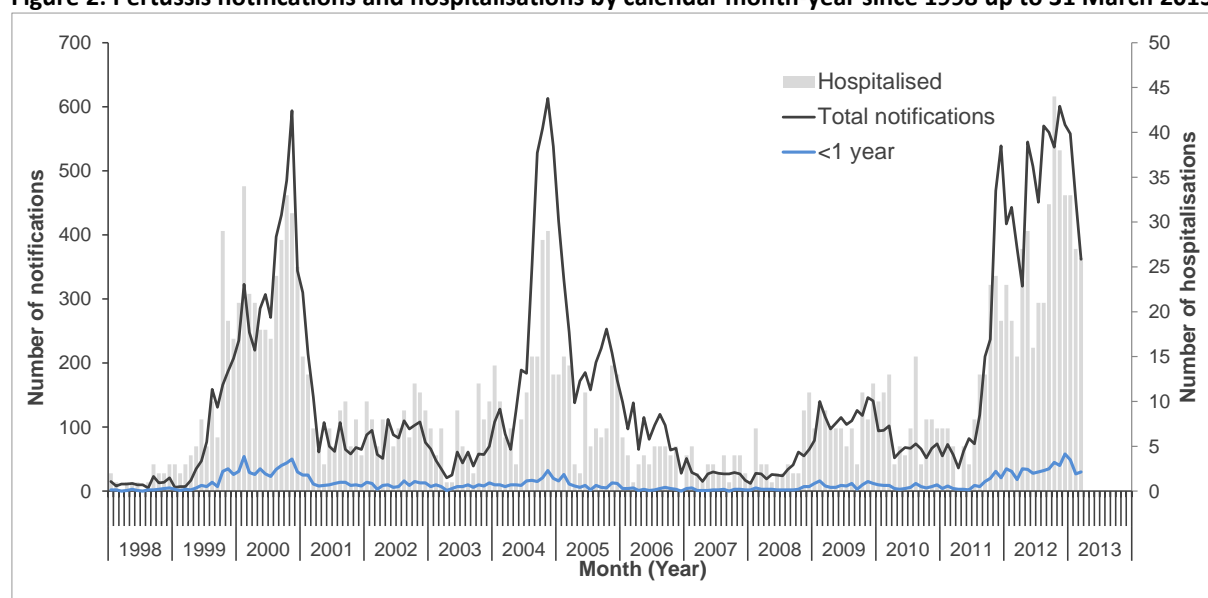


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1998 and 31 March 2013. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, notifications have been rising again since August 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 during the period 1997-2012

Figure 2: Pertussis notifications and hospitalisations by calendar month-year since 1998 up to 31 March 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 March. Pertussis rates varied across age groups. Of the cases reported in the first quarter in 2013, infants aged less than one year had the highest rate (166.7 per 100 000 population, 101 cases), followed by the 1 to 4 years (89.6 per 100 000 population, 225 cases), and 5 to 9 years (46.7 per 100 000 population, 136 cases) age groups.

Of the 1319 cases in the first quarter in 2013, seven (0.5%) 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 2013

Age group (Years)	Quarter one: Jan-Mar 2013			March 2013	
	All cases	Rates ¹	Hosp	New Cases	Hosp
<1	101	166.7	45	25	13
1 to 4	225	89.6	11	48	1
5 to 9	136	46.7	3	31	0
10 to 14	73	25.3	2	15	0
15 to 19	53	17.0	0	17	0
20 to 29	115	18.3	0	33	0
30 to 39	149	26.7	9	36	3
40 to 49	196	31.3	3	40	1
50 to 59	146	25.7	1	38	1
60 to 69	73	17.0	5	24	1
70+	52	12.4	5	13	4
Unknown	0		0	0	0
Overall	1319	29.9	84	320	24

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 March 2013 (219 cases). Of the cases in the first quarter in 2013, the ethnic-specific cumulative rates were highest for the Māori ethnic group (33.3 per 100 000, 188 cases), followed by European (32.8 per 100 000, 884 cases) and Pacific Peoples (27.8 per 100 000, 63 cases). Figure 3 shows the European ethnic group having the highest notification 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. Pacific Peoples had the highest notification rates in this age group, followed by Māori.

Table 2: Pertussis cases and rates by ethnicity (prioritised) in 2013

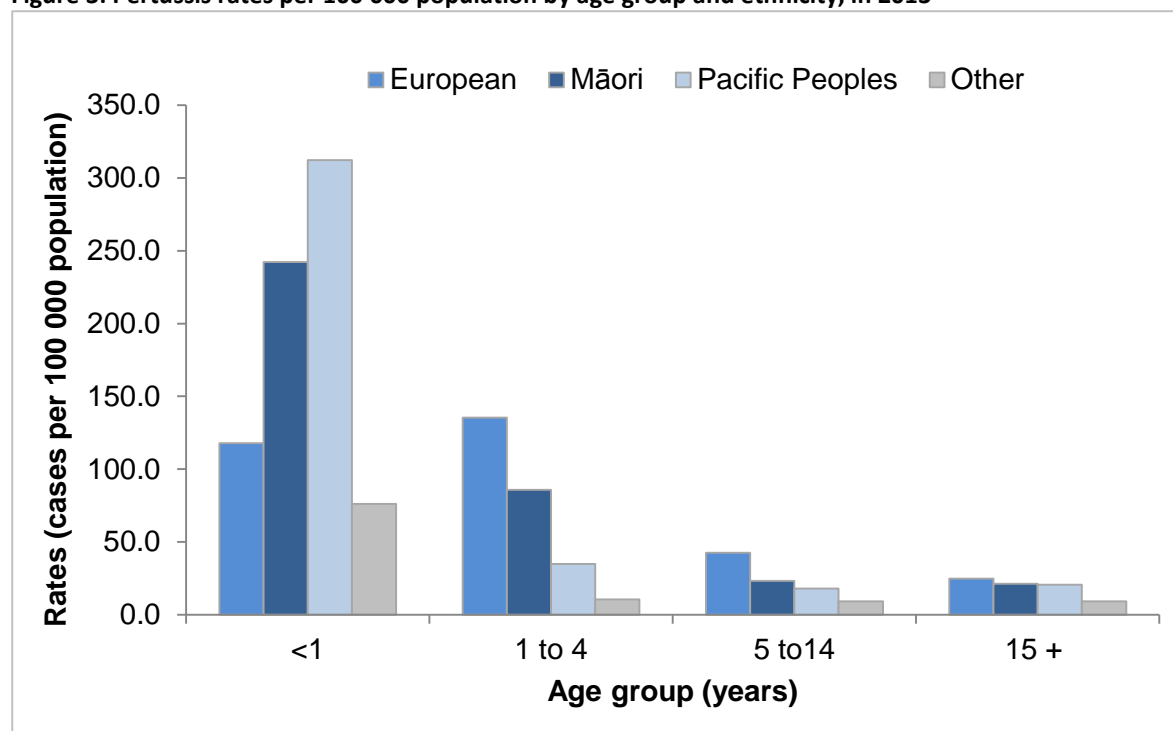
Ethnicity	Quarter one: Jan-Mar 2013			March 2013		
	All cases (Rates ¹)	<1 year* (Rates ¹)	Hosp (% ²)	New Cases	Hosp	<1 year*
Maori	188 (33.3)	34 (242.3)	28 (14.9)	47	8	10
Pacific Peoples	63 (27.8)	16 (312.4)	15 (23.8)	14	3	4
Other	38 (10.1)	4 (76.1)	6 (15.8)	10	2	1
European	884 (32.8)	35 (117.8)	30 (3.4)	219	9	7
Unknown	146	12	5	30	2	3
Overall	1319 (32.7)	101 (178.4)	84 (6.4)	320	24	25

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

*Cases in the less than 1 year age group

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



Note: Quarterly 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 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 highest in the European ethnic group. Note that these rates are for all notifications.

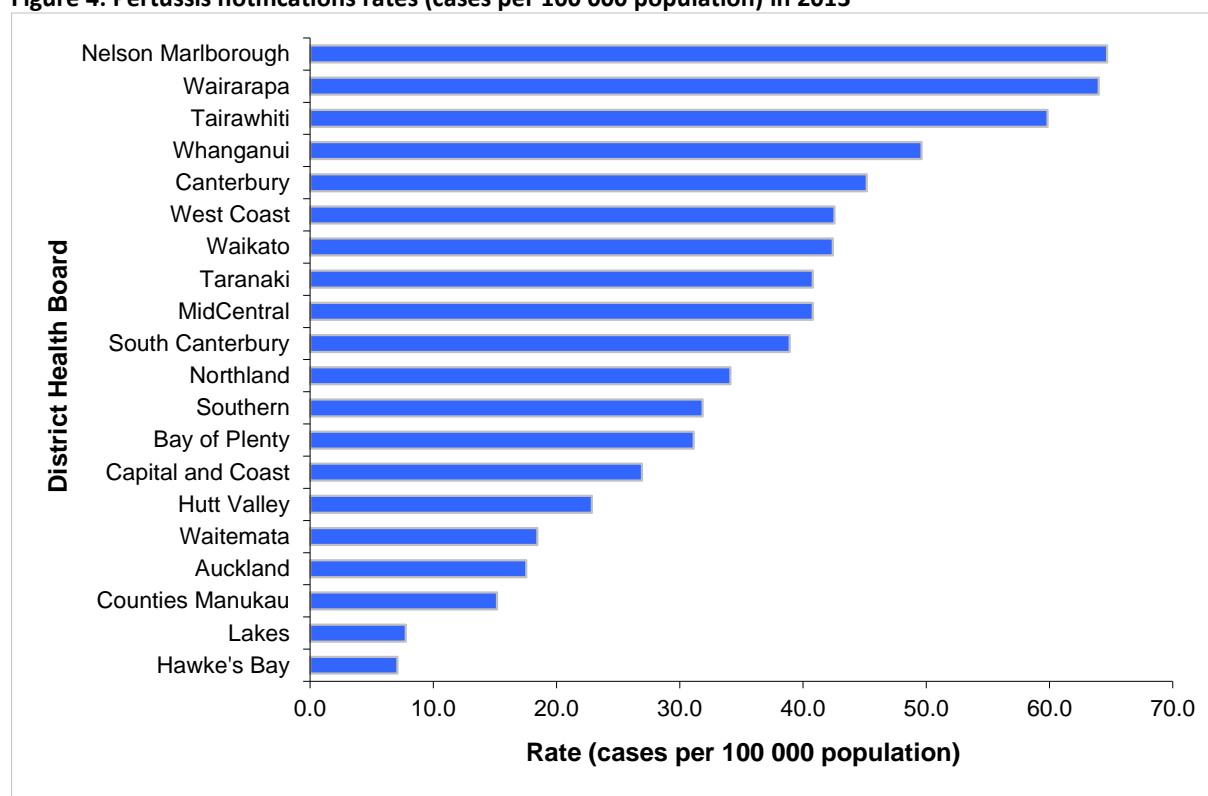
Hospitalisations and Deaths

The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5, respectively. In March, 24 hospitalisations were recorded. There have been 84 hospitalisations reported in EpiSurv in the first quarter of 2013. Forty-five (53.6%) of these were infants aged less than one year including seven cases aged less than six weeks. Of the 1063 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (26.3%, 15/57), Other (17.6%, 6/34), Māori (16.2%, 28/173), and European (3.8%, 30/799). No deaths have been reported in the first quarter of 2013.

Geographic distribution

The rates of pertussis notifications by DHB can be seen in Figure 4 and Table 5 (appendix). In March, the highest number of cases was reported in Canterbury (54 cases), Waikato (34 cases), Southern (33 cases), and Nelson Marlborough (31 cases) DHBs. The highest rates in the first quarter of 2013 were recorded in Nelson Marlborough (64.7 per 100 000, 91 cases), followed by Wairarapa (64.0 per 100 000, 26 cases), Tairāwhiti (59.8 per 100 000, 28 cases), Whanganui (49.6 per 100 000, 31 cases), and Canterbury (45.2 per 100 000, 226 cases) DHBs. The highest number of notifications was reported from Canterbury (226 cases), Waikato (157 cases), Waitemata (102 cases), Southern (98 cases), and Nelson Marlborough (91 cases) DHBs. Cases in the under 1 year age group by DHB are shown in Appendix (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 population) in 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 March and the first quarter in 2013, respectively. Of the 140 confirmed cases reported in March, 81 (57.9%) had a known vaccination status. Of these 81 cases, 25 were not vaccinated. Ten cases had received one dose of vaccine, four cases had received two doses, 13 cases had received three doses, 10 cases had received four doses, and two reported having completed pertussis vaccination. A further 17 cases reported being vaccinated but no dose information was available.

Table 3: Immunisation status of pertussis cases (confirmed) notified in March 2013

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		Unknown
							(no dose info)	Not vaccinated	
<6wks	2	0	0	0	0	0	0	1	1
6wks - 2mths	11	5	1	0	0	0	0	3	2
3-4 mths	5	2	2	0	0	0	0	1	
5mths - 3yrs	25	0	0	11	1	0	2	4	7
4 - 10yrs	26	0	1	2	9	1	4	4	5
11+ yrs	71	3	0	0	0	1	11	12	44
Unknown	0	0	0	0	0	0	0	0	0
Total	140	10	4	13	10	2	17	25	59

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 702 confirmed cases with known age reported during the first quarter of 2013, 438 (62.4%) had a known vaccination status (Table 4). Of these 438 cases, 132 were not vaccinated, including six cases aged less than 6 weeks and thus not eligible for vaccination. Thirty-nine cases had received one dose of vaccine, 17 cases had received two doses, 105 cases had received three doses, 54 cases had received four doses, and 14 cases reported having completed pertussis vaccination. A further 77 cases reported being vaccinated but no dose information was available.

Table 4: Immunisation status of pertussis cases (confirmed) notified in January to March 2013

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	30	15	2	0	0	0	0	9	4
3-4 mths	18	8	6	0	0	0	0	2	2
5mths - 3yrs	172	5	3	78	14	0	10	40	22
4 - 10yrs	64	2	1	13	3	0	0	32	13
11+ yrs	411	9	5	14	37	14	67	43	222
Unknown	0	0	0	0	0	0	0	0	0
Total	702	39	17	105	54	14	77	132	264

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

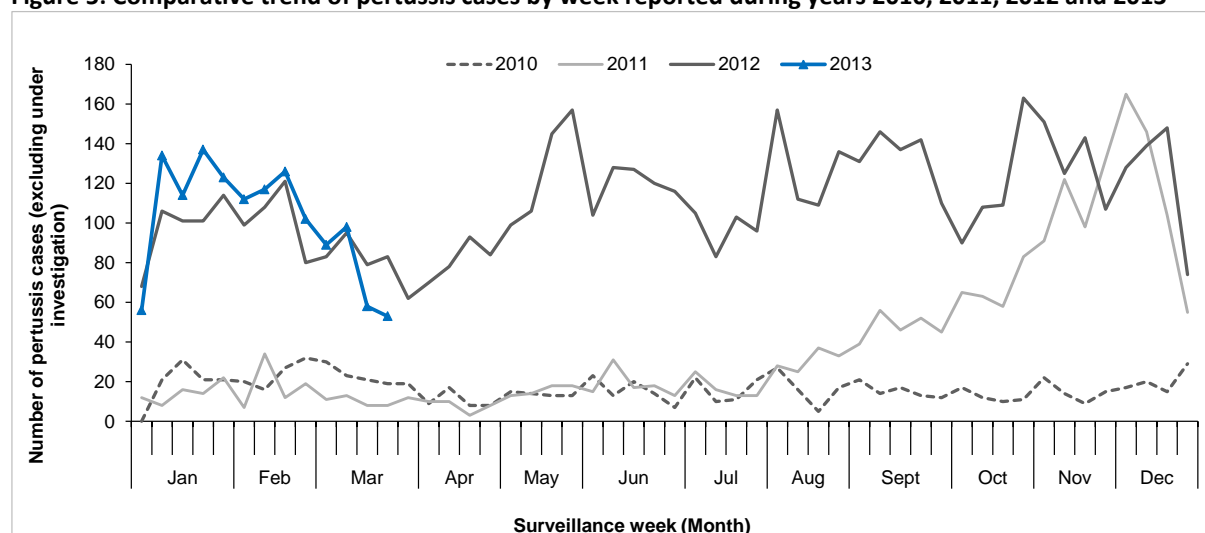
Table 5: Pertussis cases and rates by DHB in 2013

DHB	Quarter one: Jan-Mar 2013				March 2013		
	All cases	Rates ¹	Hosp	<1 year*	New Cases	Hosp	<1 year*
Northland	54	34.1	11	9	15	3	1
Waitemata	102	18.4	10	8	16	3	1
Auckland	81	17.5	10	6	15	2	0
Counties Manukau	77	15.2	22	20	18	7	6
Waikato	157	42.4	7	10	34	1	3
Lakes	8	7.8	0	1	3	0	1
Bay of Plenty	66	31.1	2	3	22	0	0
Tairāwhiti	28	59.8	0	3	9	0	1
Taranaki	45	40.8	3	3	6	1	0
Hawke's Bay	11	7.1	0	0	3	0	0
Whanganui	31	49.6	4	4	7	2	2
MidCentral	69	40.8	4	6	14	1	2
Hutt Valley	33	22.9	3	3	8	2	2
Capital and Coast	80	26.9	4	4	14	0	0
Wairarapa	26	64.0	0	2	7	0	1
Nelson Marlborough	91	64.7	1	4	31	1	1
West Coast	14	42.6	0	2	6	0	1
Canterbury	226	45.2	0	6	54	0	0
South Canterbury	22	38.9	1	0	5	0	0
Southern	98	31.8	2	7	33	1	3
Total	1319	29.8	84	101	320	24	25

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

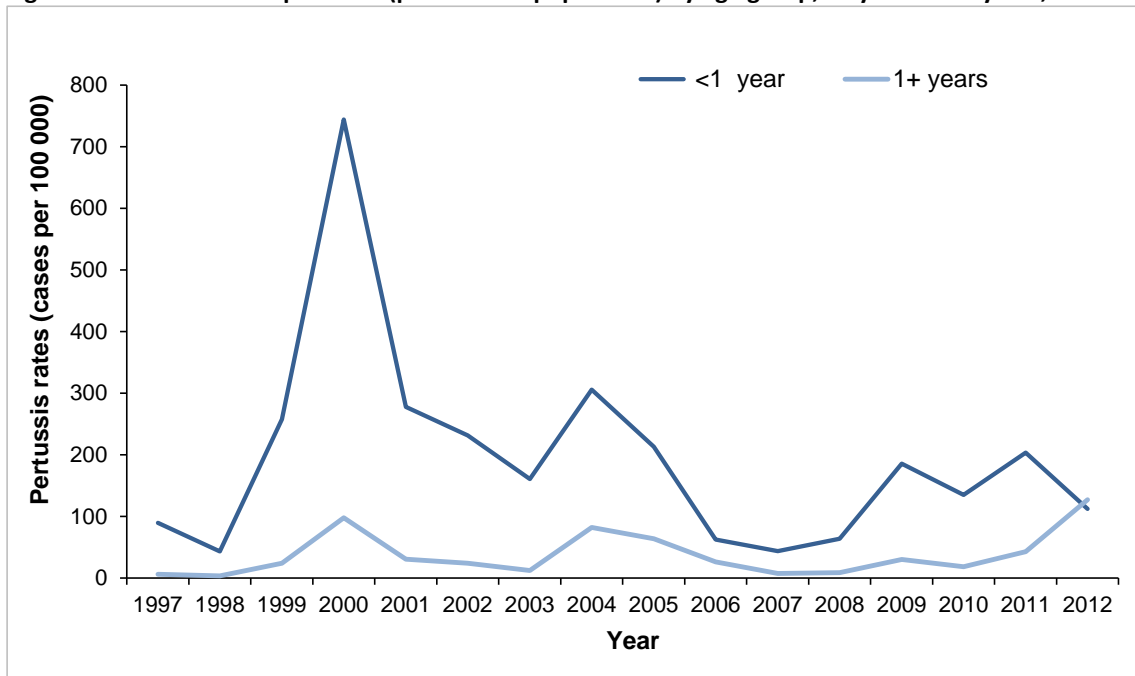
*Cases in the less than 1 year age group

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



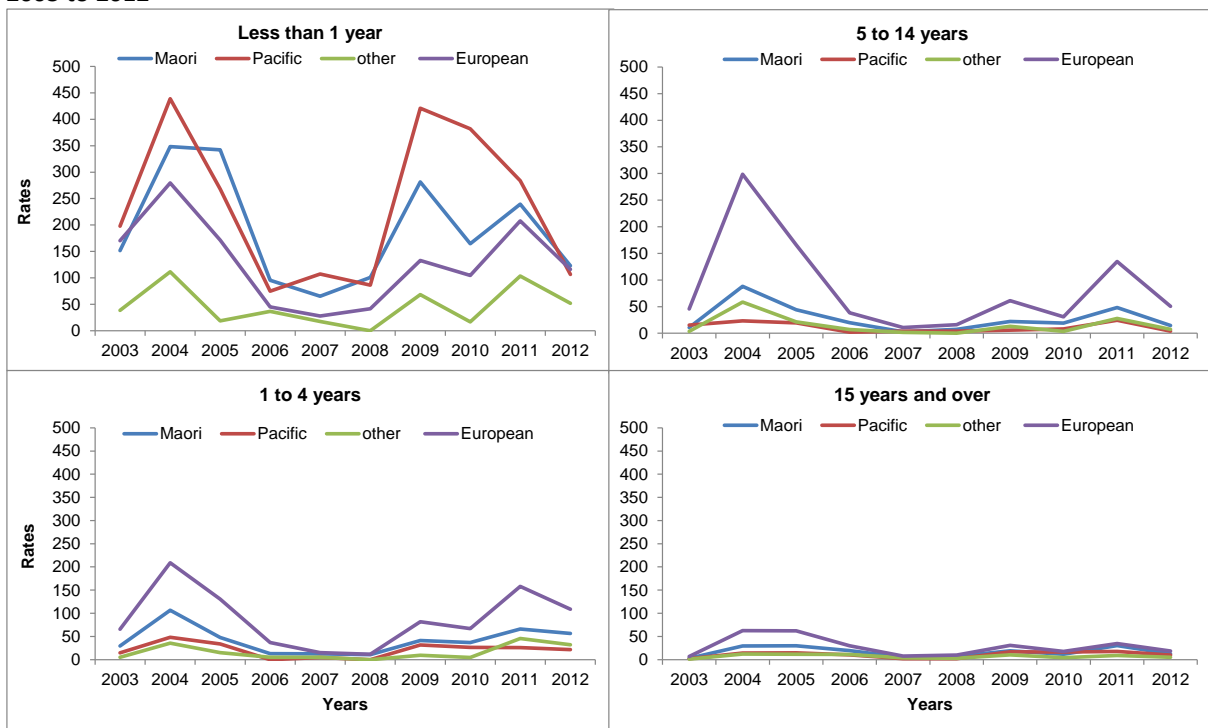
Note: Includes confirmed, probable and suspect cases only.

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 mid-year population estimates

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

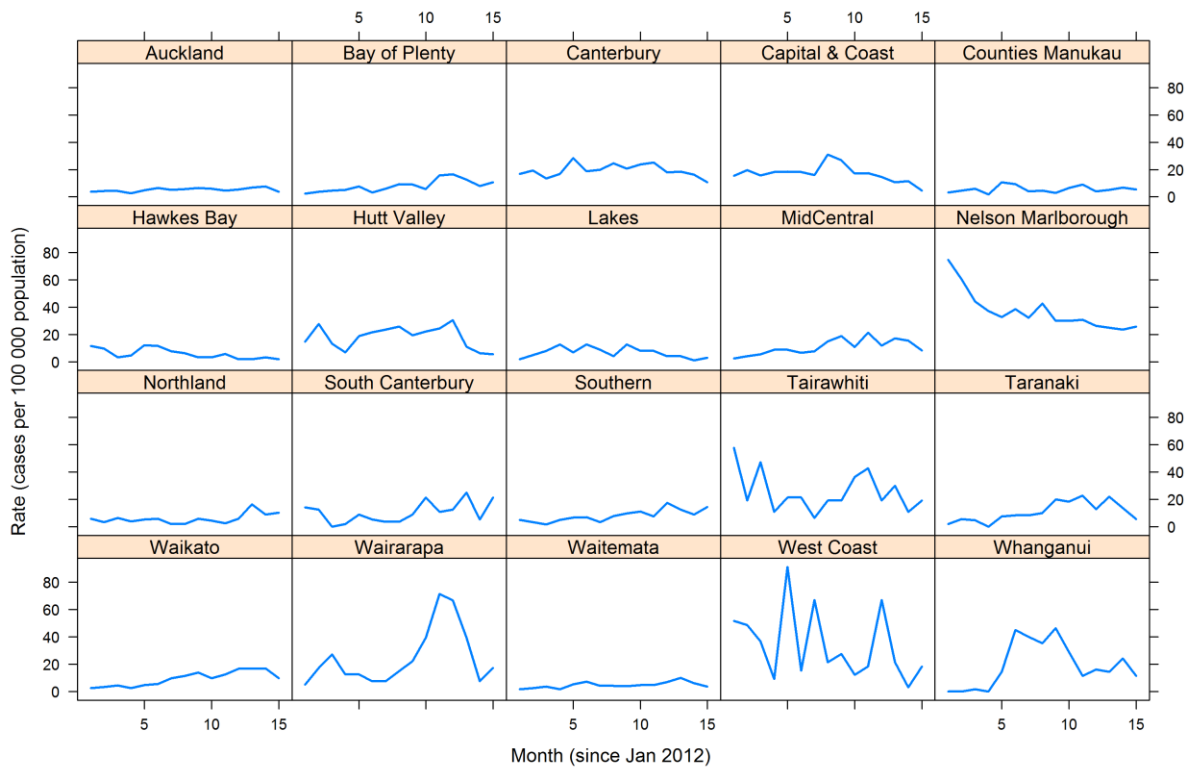
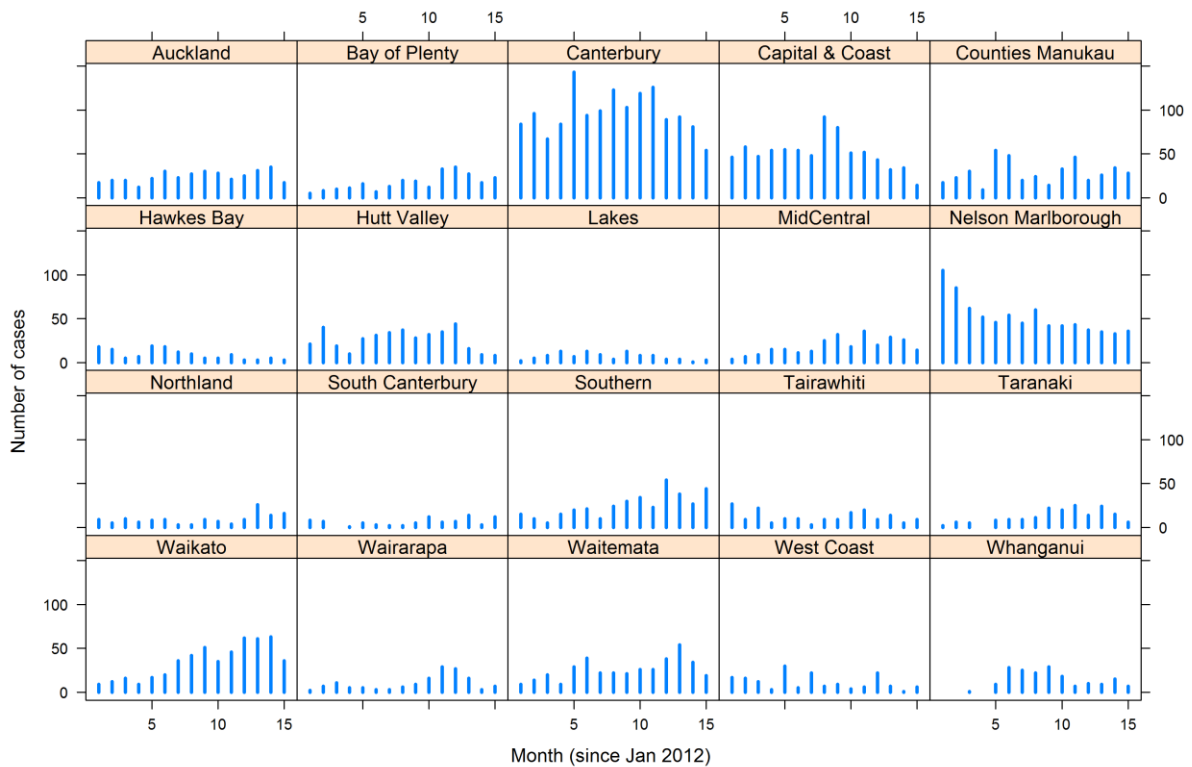


Figure 9: Monthly pertussis cases by DHB, since January 2012



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>.