

PERTUSSIS REPORT

April–June 2014

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service staff as at 4 July 2014. 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 (April to June) of 2014, 268 cases of pertussis have been notified, including 98 confirmed, 140 probable, 13 suspect, and 17 cases still under investigation. The number of cases reported in the second quarter has decreased compared to the previous quarter (Jan–Mar 2014) (363 cases). Twenty (7.5%) of the notified cases were aged less than 1 year. Thirteen cases were hospitalised and no deaths were reported. Weekly notifications during the second quarter were considerably lower than for the first quarter of 2012 and 2013 (Figure 1).

In the second quarter, the highest number of cumulative cases (excluding cases still under investigation) was reported by Waitemata DHB (48 cases), followed by Waikato (35 cases) and Counties Manukau (30 cases) DHBs. The overall cumulative rate was 5.6 per 100 000 (251 cases). The DHB with the highest cumulative rate was Waikato (9.4 per 100 000, 35 cases), followed by Capital and Coast (9.3 per 100 000, 28 cases) and Taranaki (9.0 per 100 000, 10 cases) DHBs.

In June 2014, 93 cases of pertussis were notified, including 21 confirmed, 56 probable, 6 suspect, and 10 cases still under investigation. The number of cases in June was the same as the number of cases reported in the previous month (93 cases). Six (6.5%) of the notified cases were aged less than 1 year. One case was hospitalised and no deaths were reported.

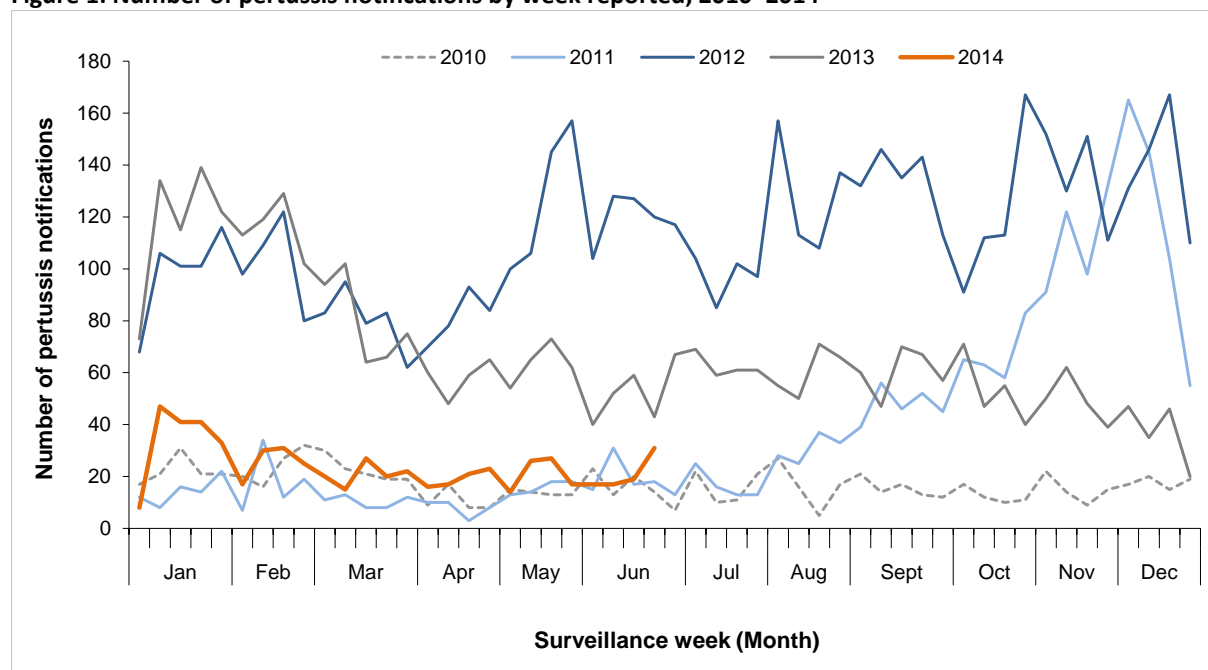
In June, the highest number of cases (excluding cases under investigation) was reported by Capital and Coast DHB (16 cases), followed by Waitemata (15 cases) and Waikato (10 cases) DHBs. The overall rate for June was 1.9 per 100 000 population (83 cases). The DHB with the highest rate was Taranaki (5.4 per 100 000, 6 cases), followed by Capital and Coast (5.3 per 100 000, 16 cases) and Hawke's Bay (4.5 per 100 000, 7 cases) DHBs.

This report summarises pertussis notifications for the second quarter of 2014 (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.

Trends in pertussis notifications

Figure 1 shows total pertussis notifications by week for 2010–2014 (to week ending 27 June). In 2014, notifications in the second quarter were considerably lower than those for the same quarter in 2012 and 2013. Since week 34 in 2011 (ending 26 August) notifications increased more or less consistently. The highest weekly notification count occurred during week 51 of 2012. Figure 5 (Appendix) shows pertussis notifications for confirmed, suspect and probable cases only by week for 2010–2014. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition.

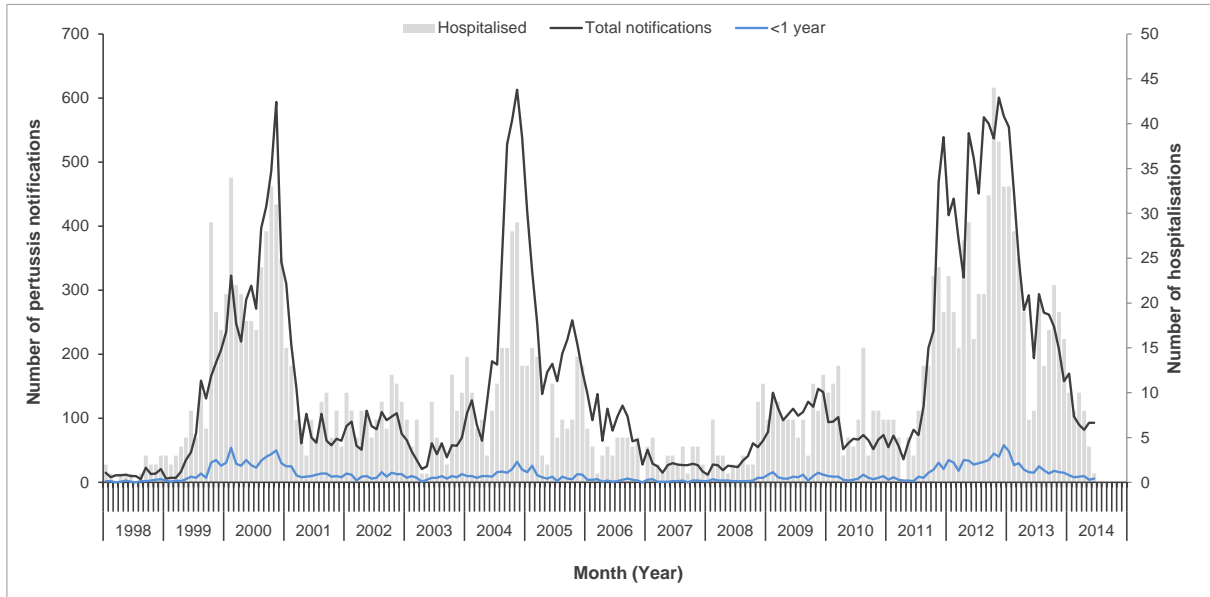
Figure 1: Number of pertussis notifications by week reported, 2010–2014



Note: Includes confirmed, probable, suspect cases and notifications still under investigation.

Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between January 1998 and June 2014. 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. Notifications began rising again in 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 1997–2013.

Figure 2: Number of pertussis notifications and hospitalisations by calendar month-year, January 1998 to June 2014



Note: Includes confirmed, probable, suspect cases and notifications still under investigation.

In the following pages, all analyses include confirmed, probable and suspect cases only. Notifications that are still under investigation are excluded.

Age

Table 1 shows notifications and rates by age, including new cases for June. Pertussis rates varied across age groups. Of the notifications in the second quarter of 2014, infants aged less than 1 year had the highest rate (30.1 per 100 000 population, 18 cases), followed by the 1–4 years (12.5 per 100 000 population, 31 cases) age group.

Of the 251 notifications in the second quarter, three (1.2%) were infants aged less than 6 weeks. Figure 3 shows the cumulative notification rate of pertussis cases by age group and ethnicity in 2014.

Table 1: Number of pertussis notifications and rate (cases per 100 000 population) by age group, Apr–Jun 2014

Age group (Years)	Apr–Jun 2014			June 2014	
	All cases ¹	Rate ²	Hospitalisations	New cases ¹	Hospitalisations
<1	18	30.1	5	5	0
1–4	31	12.5	3	7	0
5–9	11	3.7	1	3	0
10–14	16	5.6	1	8	1
15–19	8	2.6	0	4	0
20–29	25	3.9	0	7	0
30–39	32	5.7	2	11	0
40–49	45	7.3	0	13	0
50–59	26	4.5	0	7	0
60–69	21	4.7	0	12	0
70+	18	4.2	0	6	0
Overall	251	5.6	12	83	1

¹ Includes confirmed, probable and suspect cases only.

² Rate of pertussis cases per 100 000 population calculated using 2013 mid-year population estimates.

Ethnicity

Pertussis notifications and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European or Other ethnic group had the highest numbers reported in June 2014 (56 cases). Of the cases in the second quarter of 2014, the ethnic-specific cumulative rates were highest for Māori (5.4 per 100 000, 36 cases), followed by the European or Other ethnic group (5.1 per 100 000, 151 cases).

Table 2: Number of pertussis notifications and rate (cases per 100 000 population) by ethnicity (prioritised), 2014

Ethnicity	Apr–Jun 2014						June 2014		
	All cases ¹ (Rate ²)		Hosp ³	(% ⁴)	<1 year ⁵ (Rate ²)		New cases ¹	Hosp ³	<1 year ⁵
Māori	36	(5.4)	4	(11.1)	9	(58.1)	12	0	1
Pacific Peoples	10	(3.6)	1	(10.0)	1	-	2	0	0
Asian	9	(1.8)	2	(22.2)	1	-	1	0	0
MELAA	1	-	1	(100.0)	1	-	0	0	0
European or Other	151	(5.1)	3	(2.0)	5	(17.0)	56	1	3
Unknown	44	-	1	-	1	-	12	0	1
Overall	251	5.6	12	(4.8)	18	(30.1)	83	1	5

¹ Includes confirmed, probable and suspect cases only.

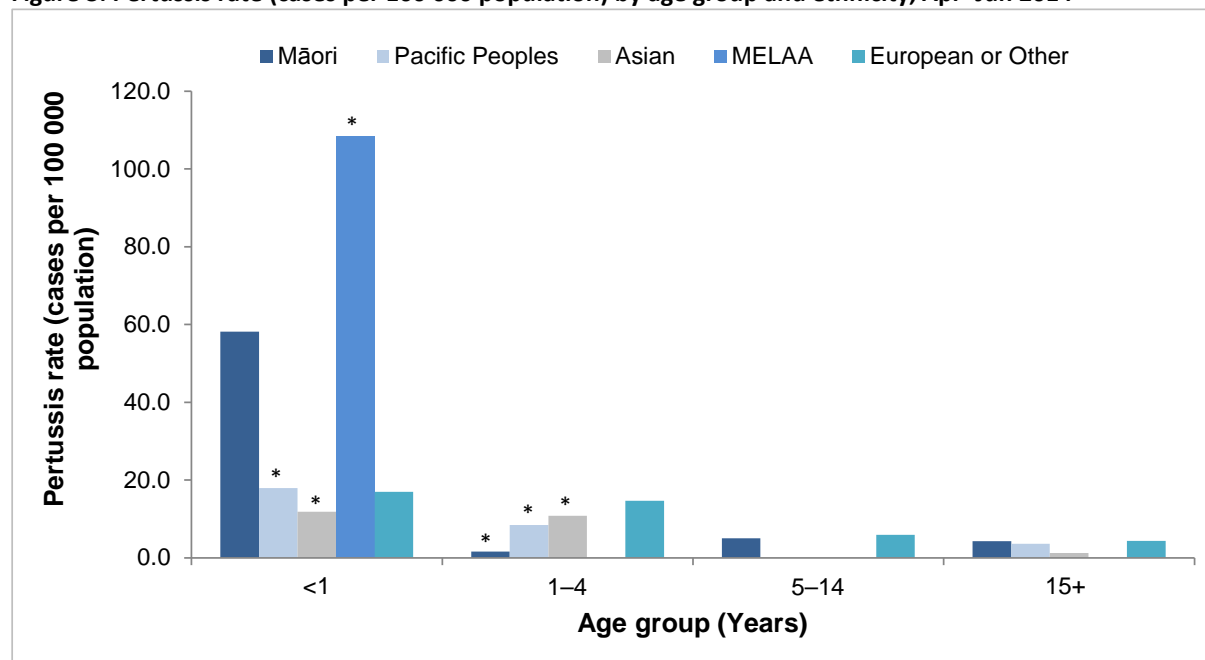
² Rate of pertussis cases per 100 000 population. Denominator data used to determine disease rates for ethnic groups are based on the proportion of people in each ethnic group from the estimated resident 2013 Census population applied to the 2013 mid-year population estimates from Statistics New Zealand. Where fewer than five cases have been notified a rate has not been calculated.

³ Number of hospitalised notifications.

⁴ Percentage of hospitalised notifications.

⁵ Number of notifications in the <1 year age group.

Figure 3: Pertussis rate (cases per 100 000 population) by age group and ethnicity, Apr–Jun 2014



Note: Cumulative notifications April to June 2014, includes confirmed, probable and suspect cases only. Denominator data used to determine disease rates for ethnic groups are based on the proportion of people in each ethnic group from the estimated resident 2013 Census population applied to the 2013 mid-year population estimates from Statistics New Zealand. * Rate based on fewer than five cases.

Figure 7 (Appendix) shows the trend of pertussis notification rates (cases per 100 000 population) by age group and ethnicity for years 2003–2013. 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 or Other ethnic group.

Hospitalisations and deaths

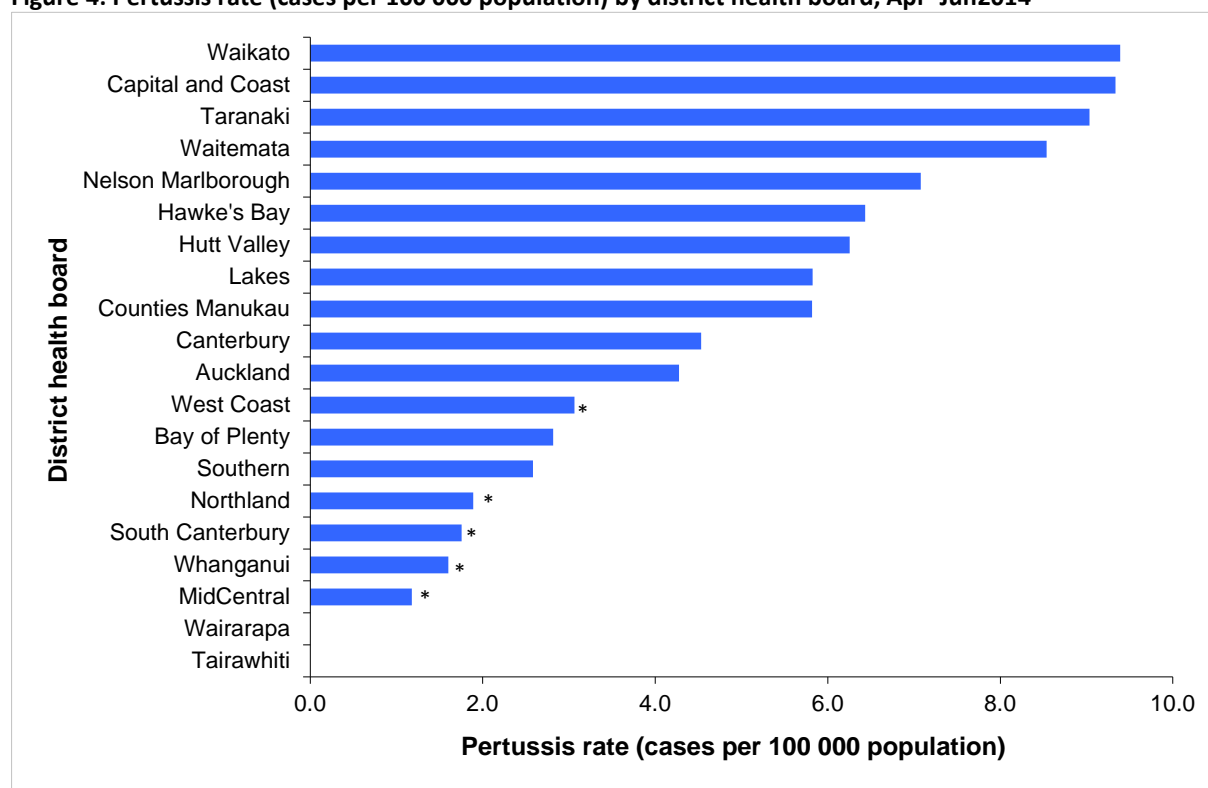
The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5. In June, one hospitalisation was recorded. There have been 12 hospitalisations recorded in EpiSurv during the second quarter. Five (41.7%) of these were infants aged less than 1 year including three cases aged less than 6 weeks. Of the 186 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: MELAA (100.0%, 1/1), Asian (22.2%, 2/9), Pacific Peoples (14.3%, 1/7), Māori (12.1%, 4/33) and European or Other (2.2%, 3/136). No deaths were reported in the second quarter.

District health board

The rates of pertussis notifications by DHB are shown in Figure 4 (and Table 5 in Appendix).

In June, the highest number of cases was reported in Capital and Coast DHB (16 cases), followed by Waitamata (15 cases) DHB. The highest rate in the second quarter was recorded in Waikato DHB (9.4 per 100 000, 35 cases), followed by Capital and Coast (9.3 per 100 000, 28 cases) and Taranaki (9.0 per 100 000, 10 cases) DHBs. Cases in the less than 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 rate (cases per 100 000 population) by district health board, Apr–Jun2014



Note: Cumulative notifications April to June 2014, includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using 2013 mid-year population estimates.

* Rate based on fewer than five cases.

Immunisation status of confirmed notifications

The immunisation status for confirmed pertussis cases is shown in Tables 3 and 4 for June and the second quarter of 2014, respectively. Of the 21 confirmed cases reported in June, nine (42.9%) had a known vaccination status. Of these, six were not vaccinated. One case had received one dose of vaccine and one case had received two doses of vaccine. One further case reported being vaccinated but no dose information was recorded.

Table 3: Immunisation status of confirmed pertussis notifications, June 2014

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks ¹	0	0	0	0	0	0	0	0	0
6wks–2mths	1	0	0	0	0	0	0	0	1
3–4mths	1	1	0	0	0	0	0	0	0
5mths–3yrs	2	0	0	0	0	0	0	2	0
4–10yrs	2	0	0	0	0	0	0	2	0
11+ yrs	15	0	1	0	0	0	1	2	11
Total	21	1	1	0	0	0	1	6	12

Note: Immunisation status has been extracted from EpiSurv. Health professionals may use a range of sources to update immunisation status including the National Immunisation Register, parental recall and Well Child book records.

¹ Children aged <6 weeks are not eligible for immunisation.

Of the 98 confirmed cases reported during the second quarter of 2014, 45 (45.9%) had a known vaccination status (Table 4). Of these, 22 were not vaccinated, including three case aged less than 6 weeks and thus not eligible for vaccination. Five cases had received one dose of vaccine, three cases had received two doses, 10 cases had received three doses and one case had received four doses. A further four cases reported being vaccinated but no dose information was recorded.

Table 4: Immunisation status of confirmed pertussis notifications, Apr–Jun 2014

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks ¹	3	0	0	0	0	0	0	3	0
6wks–2mths	4	2	0	0	0	0	0	1	1
3–4mths	3	1	2	0	0	0	0	0	0
5mths–3yrs	17	0	0	9	0	0	1	5	2
4–10yrs	10	0	0	1	1	0	1	6	1
11+ yrs	61	2	1	0	0	0	2	7	49
Total	98	5	3	10	1	0	4	22	53

Note: Immunisation status has been extracted from EpiSurv. Health professionals may use a range of sources to update immunisation status including the National Immunisation Register, parental recall and Well Child book records.

¹ Children aged <6 weeks are not eligible for immunisation.

Appendix

Table 5: Number of pertussis notifications and rate (cases per 100 000 population) by district health board, April–June 2014

District health board	Apr–Jun 2014				June 2014		
	All cases ¹	Rate ²	Hosp ³	<1 year ⁴	New cases ¹	Hosp ³	<1 year ⁴
Northland	3	-	0	1	1	0	0
Waitemata	48	8.5	1	2	15	0	2
Auckland	20	4.3	3	1	6	0	0
Counties Manukau	30	5.8	4	3	8	0	1
Waikato	35	9.4	0	3	10	0	0
Lakes	6	5.8	1	1	2	0	0
Bay of Plenty	6	2.8	1	1	0	0	0
Tairāwhiti	0	-	0	0	0	0	0
Taranaki	10	9.0	0	0	6	0	0
Hawke's Bay	10	6.4	1	1	7	1	0
Whanganui	1	-	0	0	0	0	0
MidCentral	2	-	0	0	0	0	0
Hutt Valley	9	6.3	0	0	2	0	0
Capital & Coast	28	9.3	1	4	16	0	2
Wairarapa	0	-	0	0	0	0	0
Nelson Marlborough	10	7.1	0	0	2	0	0
West Coast	1	-	0	0	0	0	0
Canterbury	23	4.5	0	1	5	0	0
South Canterbury	1	-	0	0	0	0	0
Southern	8	2.6	0	0	3	0	0
Total	251	5.6	12	18	83	1	5

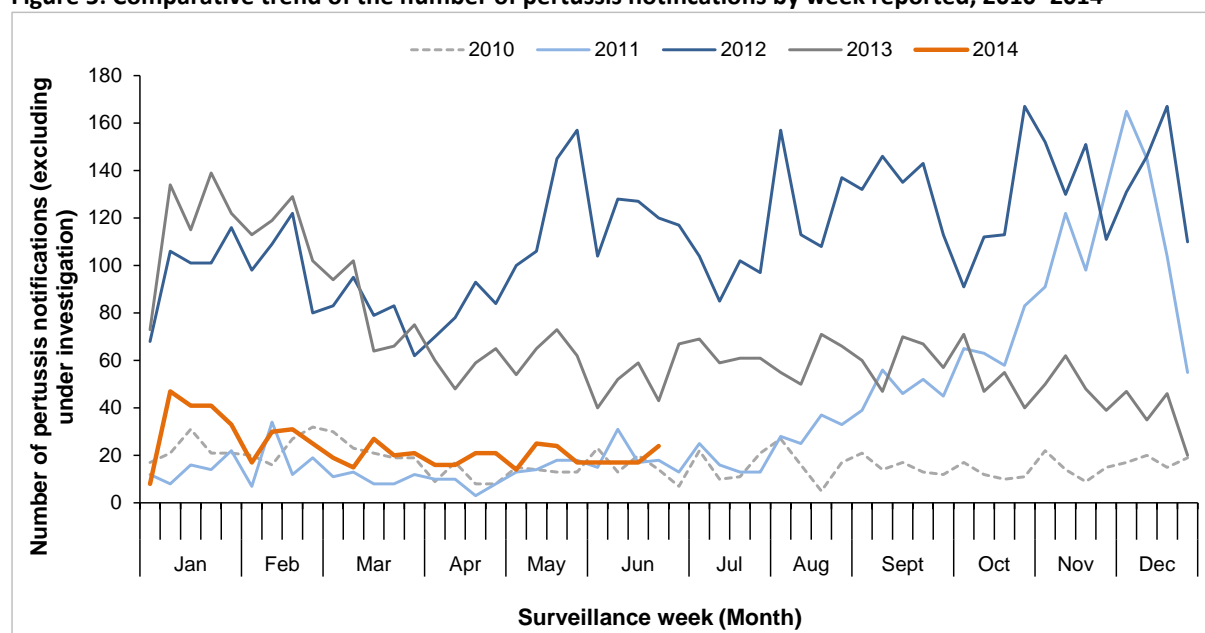
¹ Includes confirmed, probable and suspect cases only.

² Rate of pertussis cases per 100 000 population calculated using 2013 mid-year population estimates, rates have not been calculated where fewer than five cases were notified.

³ Number of hospitalised notifications.

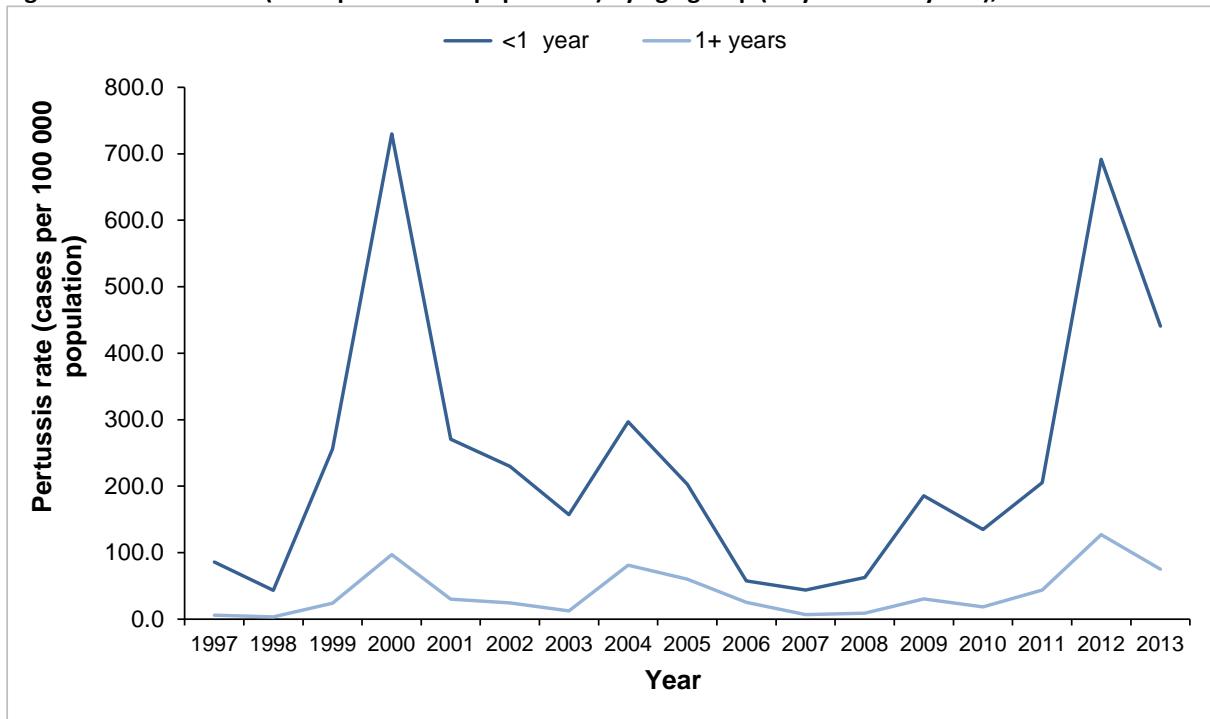
⁴ Number of cases in the <1 year age group.

Figure 5: Comparative trend of the number of pertussis notifications by week reported, 2010–2014



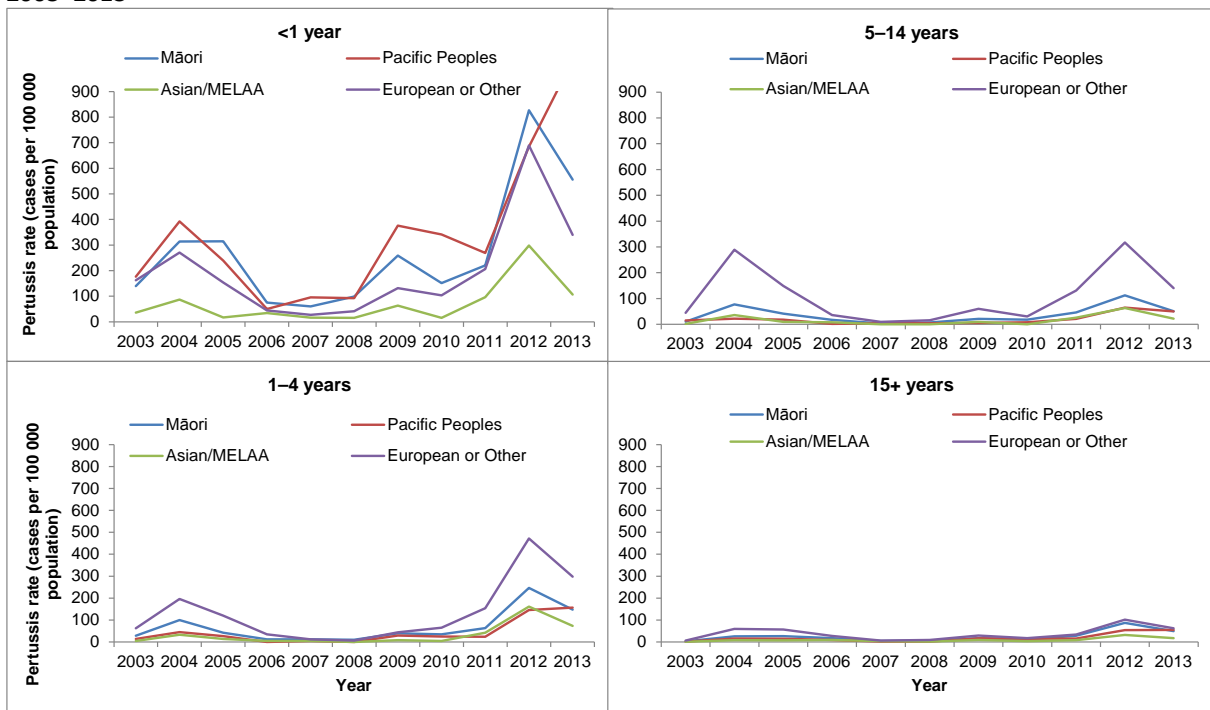
Note: Includes confirmed, probable and suspect cases only.

Figure 6: Pertussis rate (cases per 100 000 population) by age group (<1 year vs. 1+ years), 1997–2013



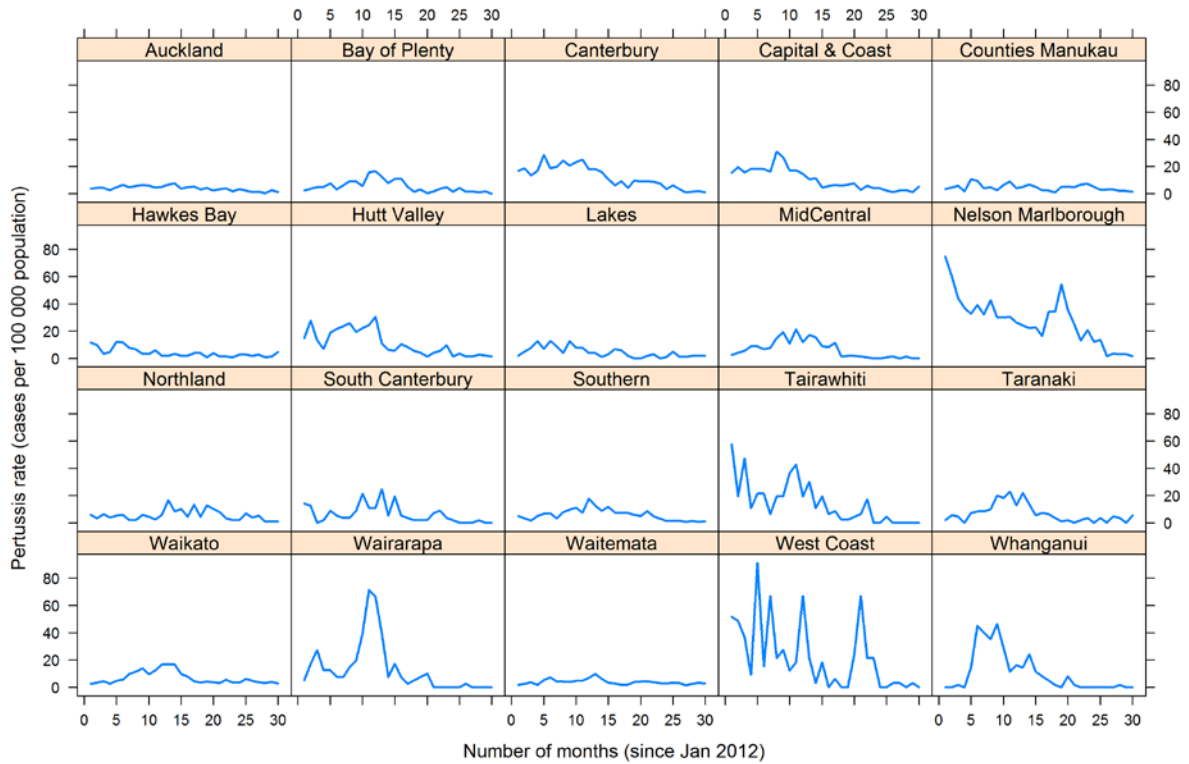
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

Figure 7: Trends in pertussis rates (cases per 100 000 population) by age group and ethnicity, 2003–2013



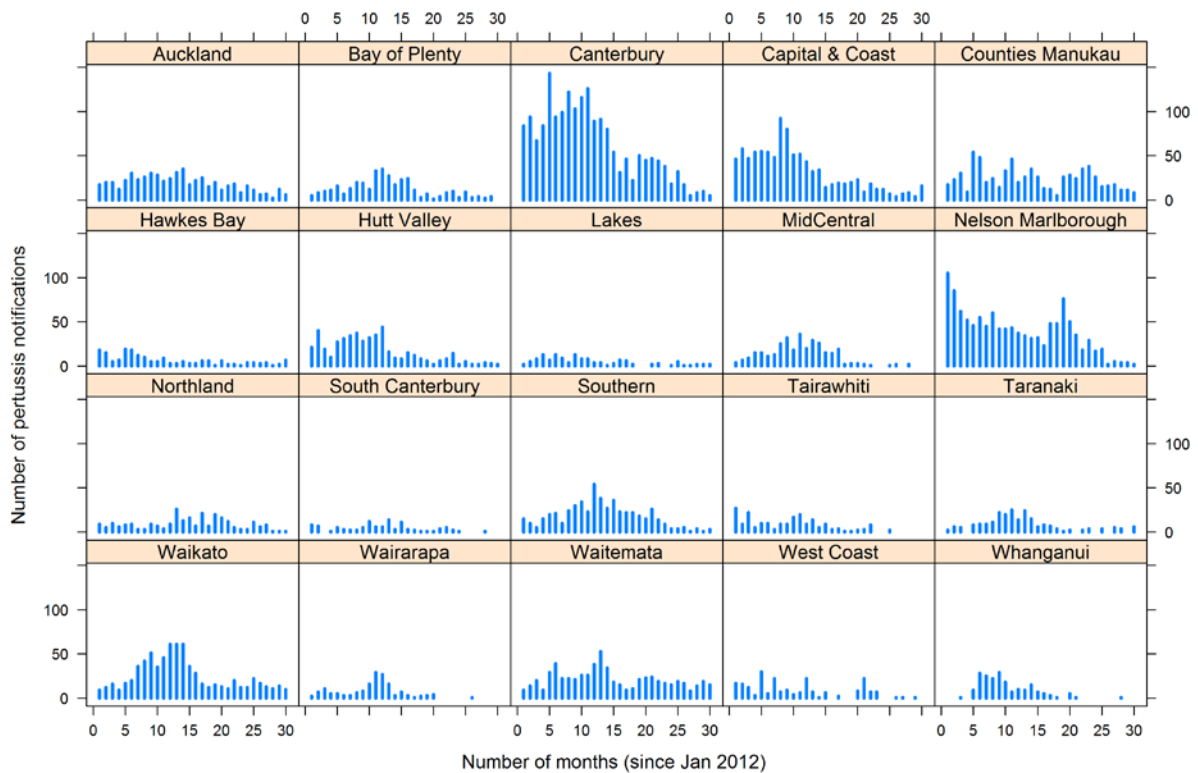
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

Figure 8: Monthly pertussis rate (cases per 100 000 population) by district health board, since January 2012



Note: Includes confirmed, probable and suspect cases only.

Figure 9: Monthly pertussis cases by district health board, since January 2012



Note: Includes confirmed, probable and suspect cases 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>