ISSN 2381-9669

PERTUSSIS REPORT

January–March 2014

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service staff as at 7 April 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 first quarter (January to March) of 2014, 373 cases of pertussis have been notified, including 147 confirmed, 175 probable, 12 suspect, and 39 cases still under investigation. The number of cases reported in the first quarter has decreased compared to the previous quarter (Oct–Dec 2013) (609 cases). Twenty-eight (7.5%) of the notified cases were aged less than 1 year. Twenty-eight cases were hospitalised and no deaths were reported. Weekly notifications during the first quarter were considerably lower than for the first quarter of 2012 and 2013 (Figure 1).

In the first quarter, the highest number of cumulative cases (excluding cases still under investigation) was reported by Canterbury and Waikato (53 cases each) DHBs, followed by Counties Manukau (41 cases) DHB. The overall cumulative rate was 7.5 per 100 000 (334 cases). The DHB with the highest cumulative rate was Nelson Marlborough (17.0 per 100 000, 24 cases), followed by Northland (15.1 per 100 000, 24 cases) and Waikato (14.2 per 100 000, 53 cases) DHBs.

In March 2014, 99 cases of pertussis were notified, including 28 confirmed, 40 probable, 1 suspect, and 30 cases still under investigation. The number of cases in March has decreased compared to the previous month (104 cases). Nine (9.1%) of the notified cases were aged less than 1 year. Ten cases were hospitalised and no deaths were reported.

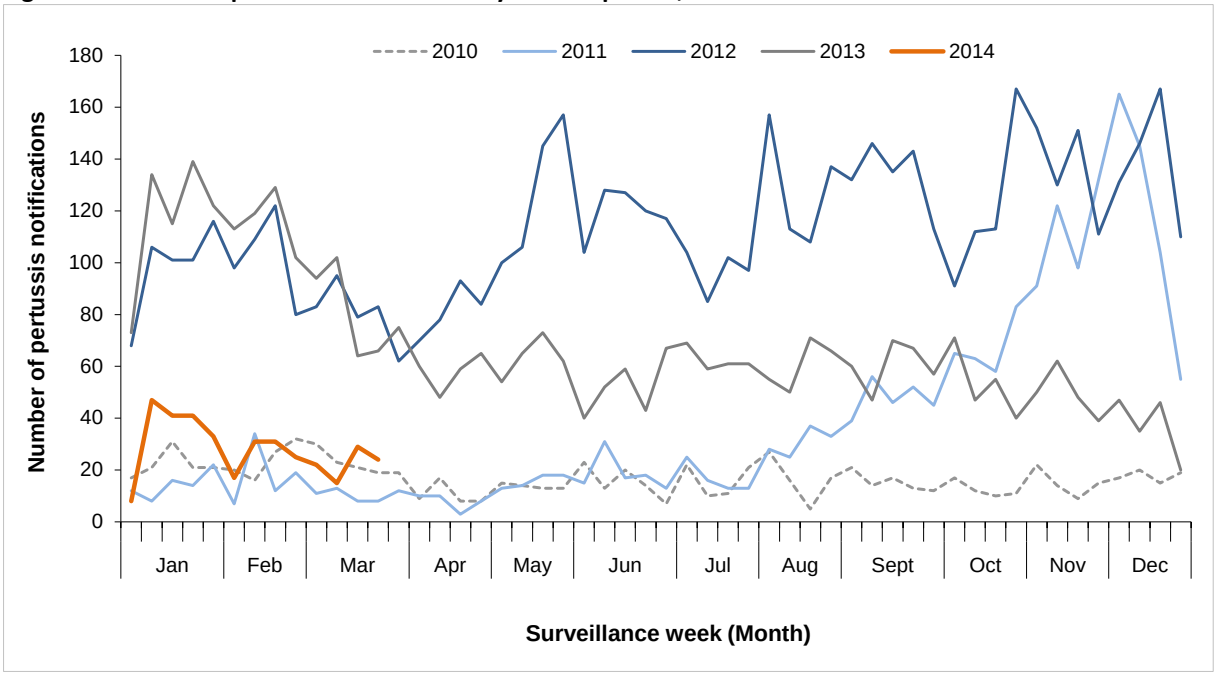
In March, the highest number of cases (excluding cases under investigation) was reported by Waikato DHB (14 cases), followed by Counties Manukau (11 cases) DHB. The overall rate in March was 1.5 per 100 000 population (69 cases). The DHB with the highest rate was Taranaki (4.5 per 100 000, 5 cases), followed by Northland (4.4 per 100 000, 7 cases) and Waikato (3.8 per 100 000, 14 cases) DHBs.

This report summarises pertussis notifications for 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 28 March). In 2014, notifications in the first quarter were considerably lower than those for the first quarter of 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.

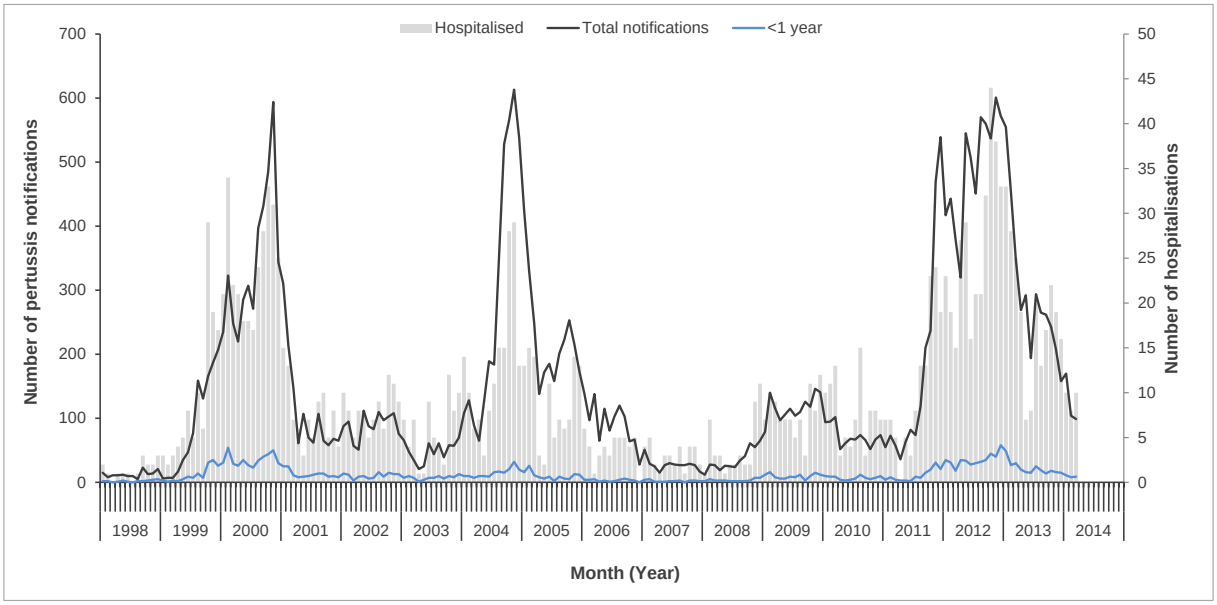
Figure 1: Number of pertussis notifications by week reported, 2010–2014



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 March 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 March 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 March. Pertussis rates varied across age groups. Of the notifications in the first quarter of 2014, infants aged less than 1 year had the highest rate (45.1 per 100 000 population, 27 cases), followed by the 1–4 years (18.2 per 100 000 population, 45 cases) age group.

Of the 334 notifications in the first quarter, 2 (0.6%) 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, Jan–Mar 2014

	Jan–Mar 2014			March 2014	
Age group (Years)	**All cases[1]**	**Rate[2]**	**Hospitalisations**	**New cases[1]**	**Hospitalisations**
<1	27	45.1	11	8	5
1–4	45	18.2	5	6	0
5–9	31	10.4	1	7	1
10–14	21	7.4	0	5	0
15–19	13	4.2	0	5	0
20–29	34	5.3	2	4	0
30–39	34	6.1	3	6	2
40–49	41	6.6	1	11	1
50–59	42	7.2	1	10	1
60–69	29	6.5	3	1	0
70+	17	4.0	1	6	0
Overall	334	7.5	28	69	10

[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

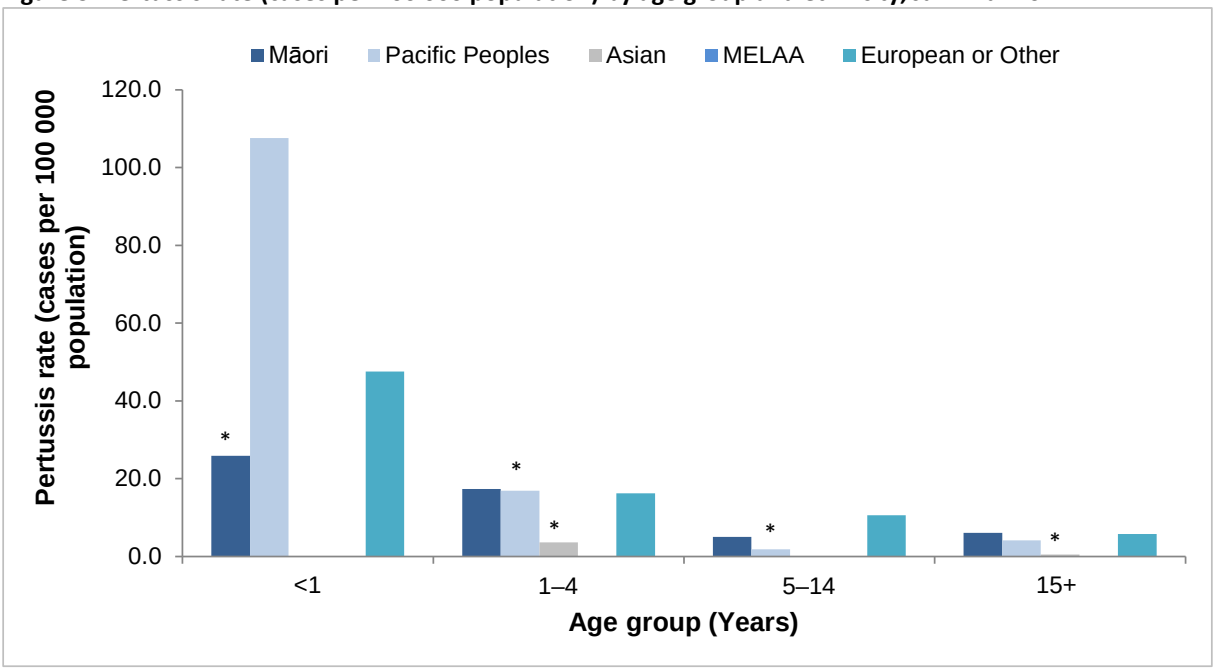
Pertussis notifications and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European or Other ethnic group had the highest numbers reported in March 2014 (43 cases). Of the cases in the first quarter of 2014, the ethnic-specific cumulative rates were highest for Māori (7.3 per 100 000, 49 cases), followed by the European or Other ethnic group (7.2 per 100 000, 212 cases). Figure 3 shows that Pacific Peoples had the highest notification rate in the less than 1 year age group.

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

	Jan–Mar 2014						March 2014		
Ethnicity	All cases[1]	(Rate[2])	Hosp[3]	(%[4])	<1 year[5]	(Rate[2])	New cases[1]	Hosp[3]	<1 year[5]
Māori	49	(7.3)	7	(14.3)	4	-	15	3	2
Pacific Peoples	19	(6.9)	6	(31.6)	6	(107.6)	4	1	0
Asian	3	-	0	-	0	-	3	0	0
MELAA	0	-	0	-	0	-	0	0	0
European or Other	212	(7.2)	13	(6.1)	14	(47.5)	43	6	6
Unknown	51	-	2	-	3	-	4	0	0
Overall	334	(7.5)	28	(8.4)	27	(45.1)	69	10	8

[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, Jan–Mar 2014



Note: Cumulative notifications since 1 January 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

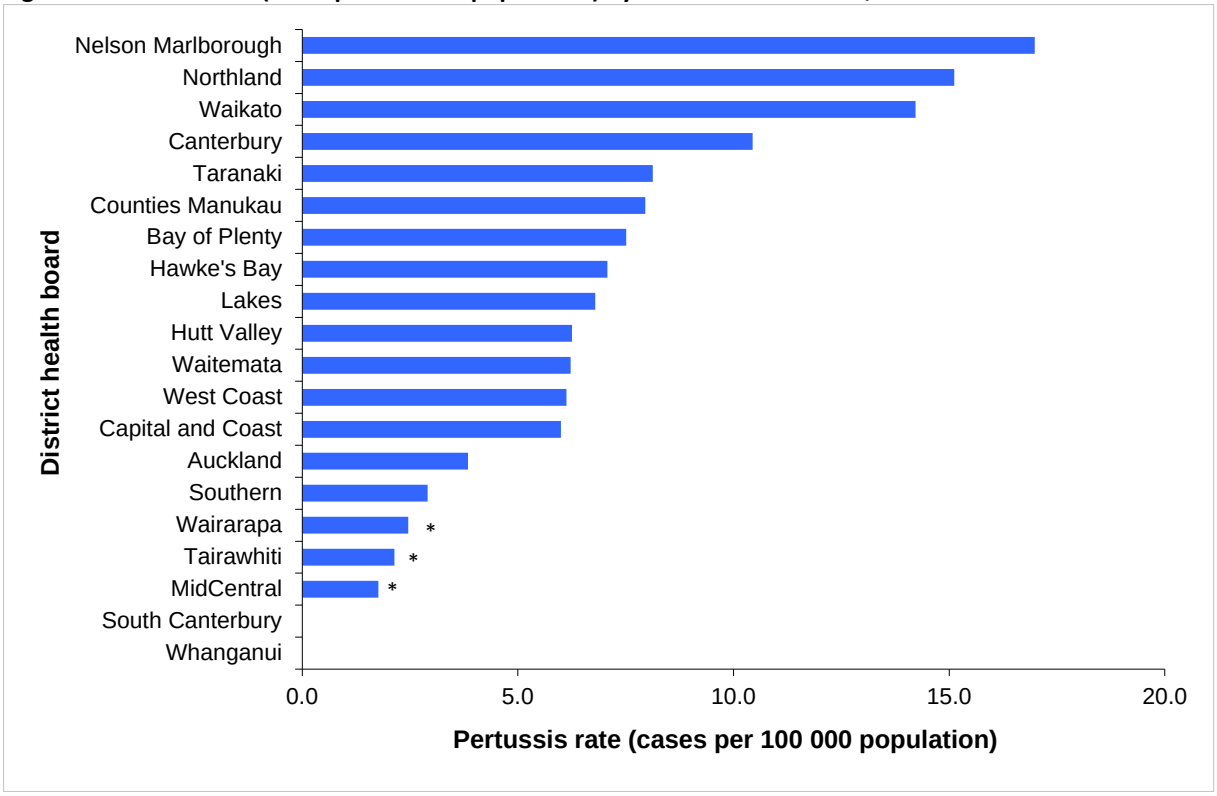
The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5. In March, 10 hospitalisations were recorded. There have been 28 hospitalisations recorded in EpiSurv during the first quarter. Eleven (39.3%) of these were infants aged less than 1 year including two cases aged less than six weeks. Of the 309 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (31.6%, 6/19), Māori (14.9%, 7/47), and European or Other (6.7%, 13/195). No hospitalisations were reported for the Asian and MELAA ethnic groups. No deaths were reported in the first quarter.

District health board

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

In March, the highest number of cases was reported in Waikato DHB (14 cases), followed by Counties Manukau (11 cases) DHB. The highest rate in the first quarter was recorded in Nelson Marlborough DHB (17.0 per 100 000, 24 cases), followed by Northland (15.1 per 100 000, 24 cases) and Waikato (14.2 per 100 000, 53 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, Jan–Mar 2014



Note: Cumulative notifications since 1 January 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 March and the first quarter of 2014, respectively. Of the 28 confirmed cases reported in March, 11 (39.3%) had a known vaccination status. Of these, three were not vaccinated. Four cases had received one dose of vaccine, two cases had received four doses, and one case was recorded as having completed pertussis vaccination (five doses). One further case reported being vaccinated but no dose information was recorded.

Table 3: Immunisation status of confirmed pertussis notifications, March 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								
6wks–2mths	3	2						1	
3–4mths	1	1							
5mths–3yrs	3				2			1	
4–10yrs	1					1			
11+ yrs	20	1					1	1	17
Total	28	4	0	0	2	1	1	3	17

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 147 confirmed cases reported during the first quarter of 2014, 85 (57.8%) had a known vaccination status (Table 4). Of these, 31 were not vaccinated, including one case aged less than 6 weeks and thus not eligible for vaccination. Eleven cases had received one dose of vaccine, three cases had received two doses, 21 cases had received three doses, seven cases had received four doses, and three cases were reported as having completed pertussis vaccination (five doses). A further nine cases reported being vaccinated but no dose information was recorded.

Table 4: Immunisation status of confirmed pertussis notifications, Jan–Mar 2014

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks[1]	1							1	
6wks–2mths	11	7					1	3	
3–4mths	3	1	2						
5mths–3yrs	30	1	1	19			2	7	
4–10yrs	20			2	7	2	2	2	5
11+ yrs	82	2				1	4	18	57
Total	147	11	3	21	7	3	9	31	62

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.

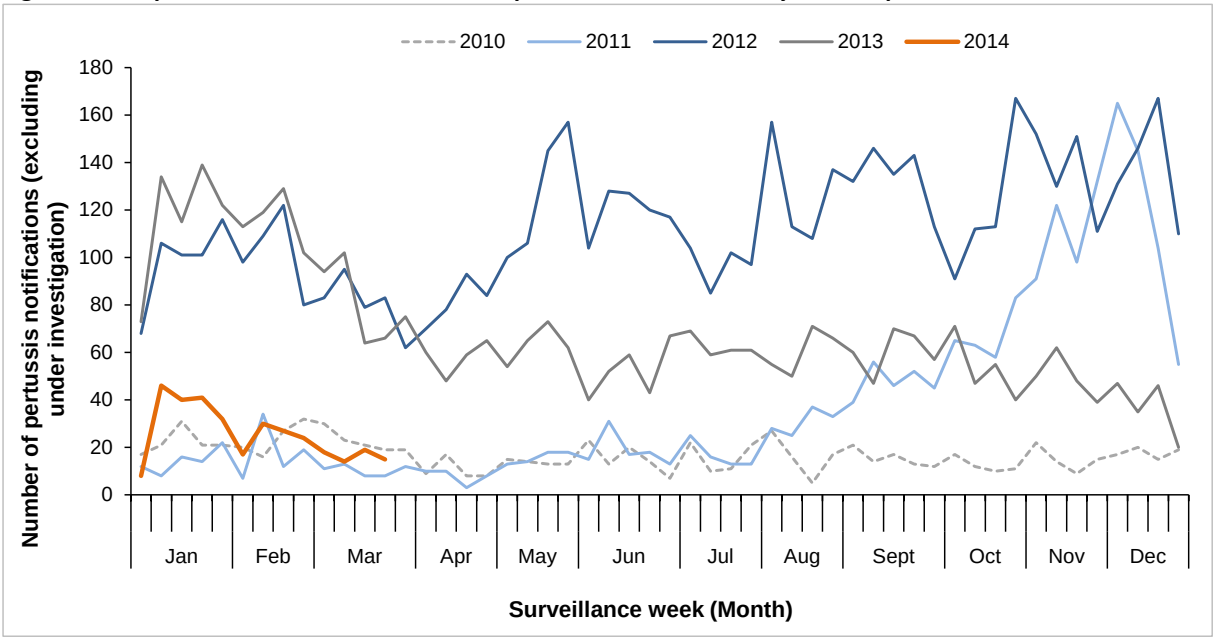
Appendix

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

District health board	Jan–Mar 2014 All cases[1]	Rate[2]	Hosp[3]	<1 year[4]	March 2014 New cases[1]	Hosp[3]	<1 year[4]
Northland	24	15.1	0	2	7	0	1
Waitemata	35	6.2	5	6	4	2	0
Auckland	18	3.8	3	1	2	1	0
Counties Manukau	41	8.0	8	4	11	3	1
Waikato	53	14.2	6	3	14	1	1
Lakes	7	6.8	0	0	1	0	0
Bay of Plenty	16	7.5	1	0	4	0	0
Tairawhiti	1	2.1	0	1	0	0	0
Taranaki	9	8.1	2	3	5	2	3
Hawke's Bay	11	7.1	1	1	4	1	1
Whanganui	0	0.0	0	0	0	0	0
MidCentral	3	1.8	0	2	0	0	0
Hutt Valley	9	6.3	1	0	2	0	0
Capital & Coast	18	6.0	0	2	7	0	0
Wairarapa	1	2.5	0	0	0	0	0
Nelson Marlborough	24	17.0	0	2	3	0	1
West Coast	2	6.1	0	0	1	0	0
Canterbury	53	10.4	1	0	4	0	0
South Canterbury	0	0.0	0	0	0	0	0
Southern	9	2.9	0	0	0	0	0
Total	334	7.5	28	27	69	10	8

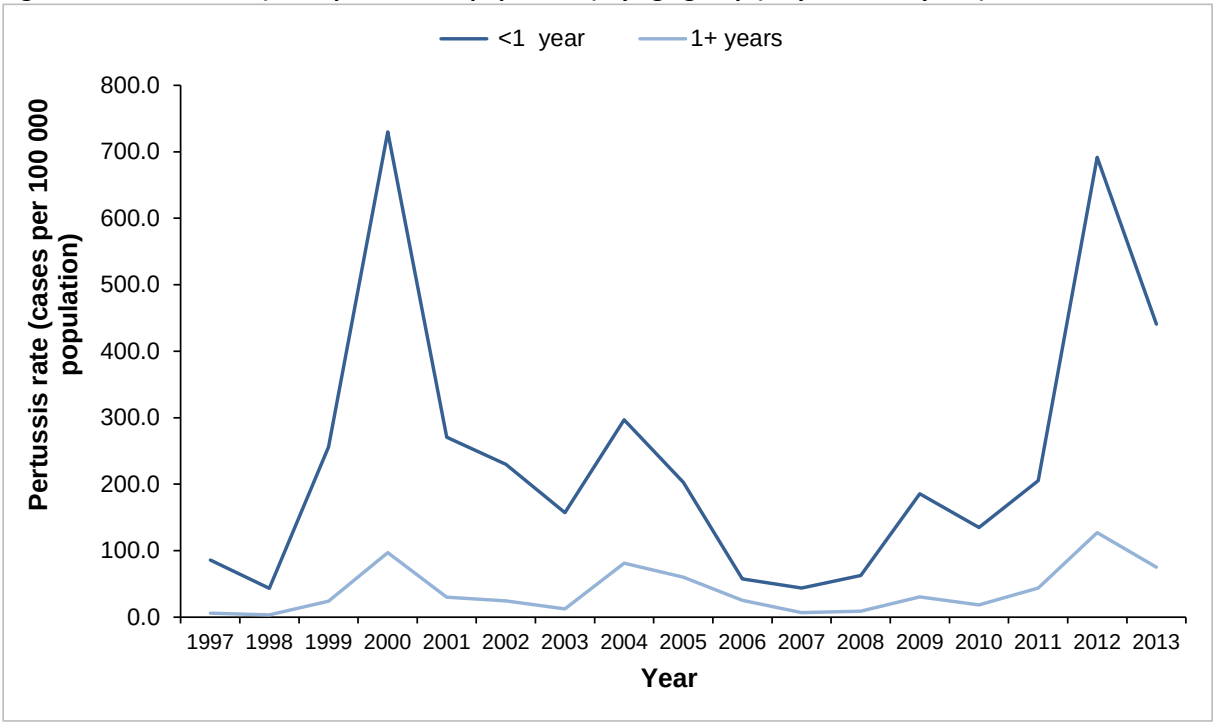
[1] Includes confirmed, probable and suspect cases only.
[2] Rate of pertussis cases per 100 000 population calculated using 2013 mid-year population estimates, rates have not been calculated where fewer than five cases were notified.
[3] Number of hospitalised notifications.
[4] Number of cases in the <1 year age group.

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



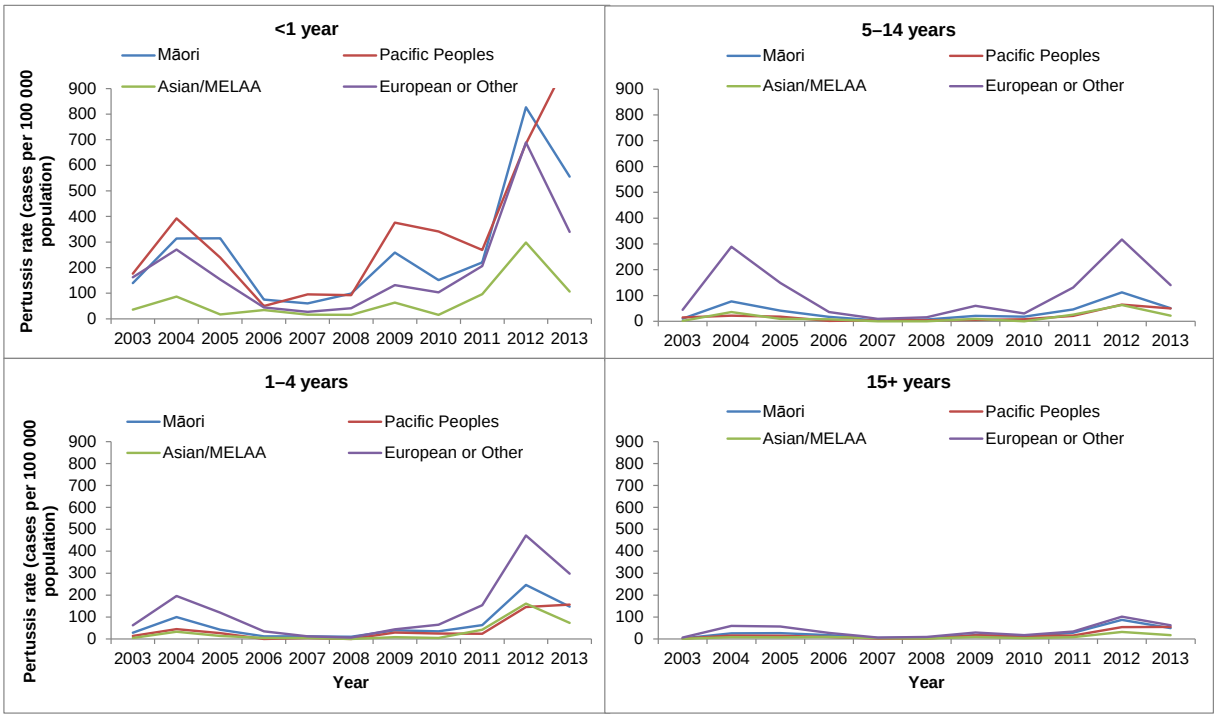
Note: Includes confirmed, probable and suspect cases only.

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



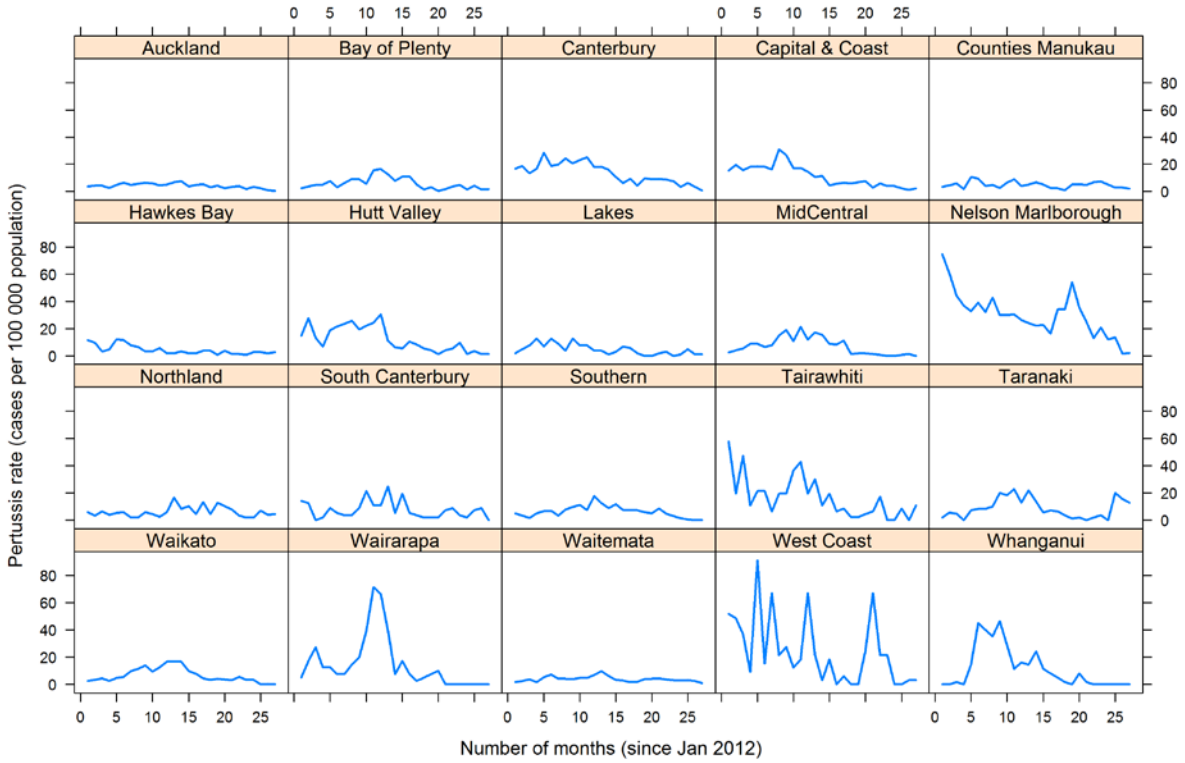
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

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



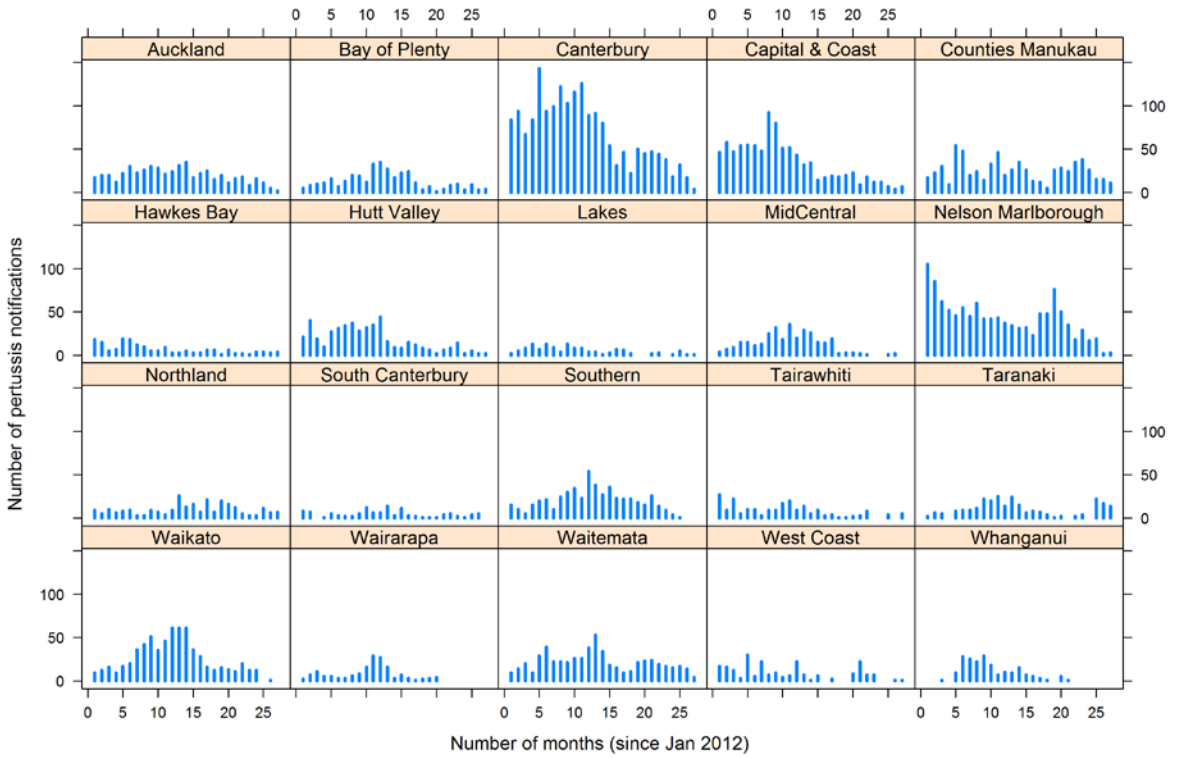
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

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 *Bordetella pertussis* 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: • 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 *under investigation* 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 *B. pertussis* or detection of *B. pertussis* nucleic acid, preferably from a nasopharyngeal swab, or is epidemiologically linked to a confirmed case.
Probable	A clinically compatible illness with a high *B. pertussis* 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: • 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