ISSN 2381-9669

PERTUSSIS REPORT

January–March 2015

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service staff as at 7 April 2015. 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–March) of 2015, 213 cases of pertussis have been notified, including 128 confirmed, 77 probable, 3 suspect, and 5 cases still under investigation. The number of cases reported in the first quarter was lower than the previous quarter (October–December 2014, 259 cases). Twenty-one (9.9%) of the notified cases were aged less than 1 year. Seventeen 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).

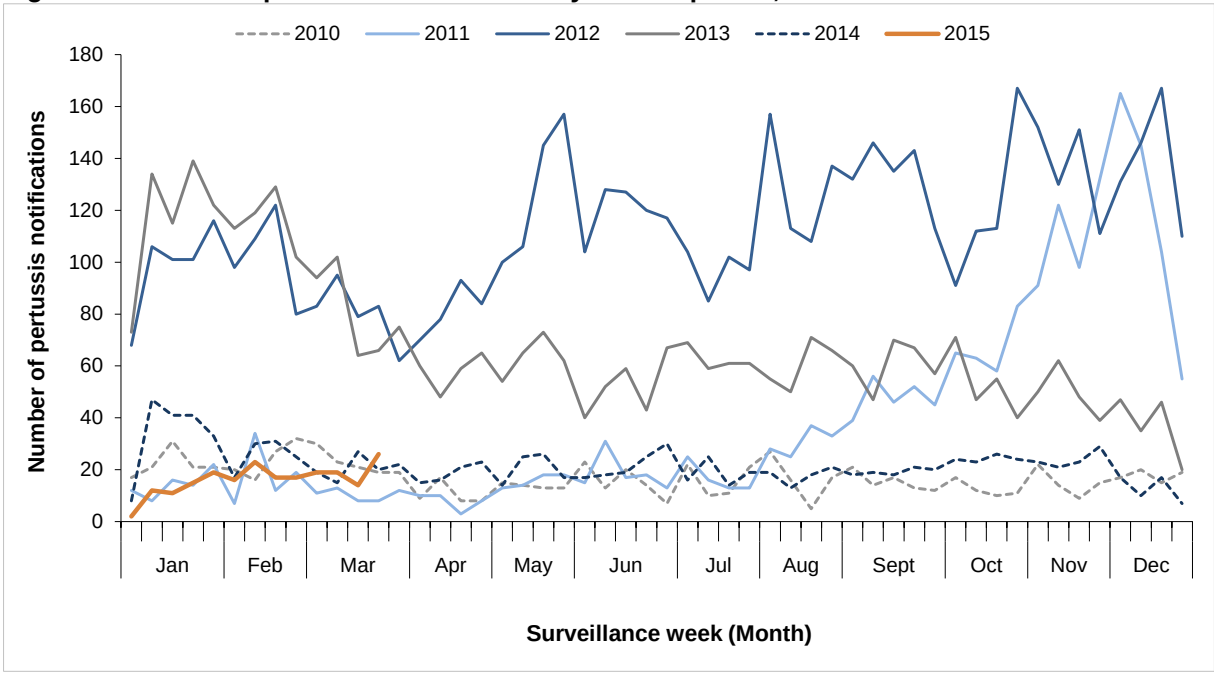
The highest number of cases (excluding cases still under investigation) was reported by Capital & Coast DHB (37 cases), followed by Waitemata (34 cases) and Counties Manukau (30 cases) DHBs. The overall rate was 4.6 per 100,000 (208 cases). The DHB with the highest rate was Capital & Coast (12.5 per 100,000, 37 cases), followed by Northland (10.8 per 100,000, 18 cases) DHB.

This report summarises pertussis notifications for the first quarter of 2015. 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 2010–2015 (to week ending 27 March). In 2015, notifications in the first 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 until week 12 in 2013, since then notifications have decreased. 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 2010–2015. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition.

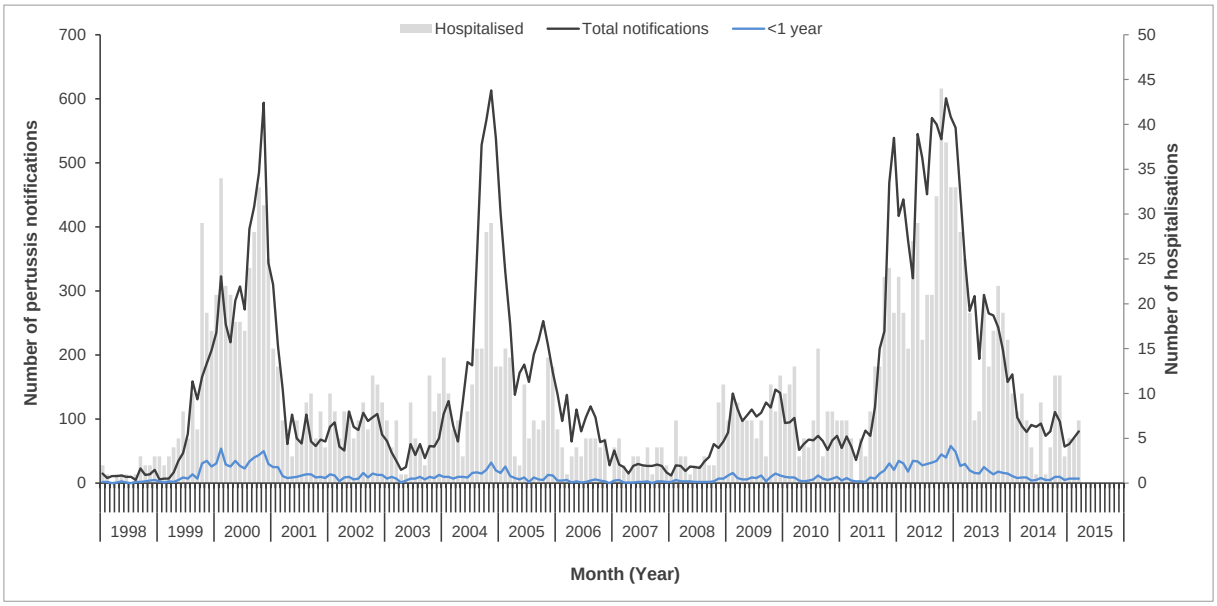
Figure 1: Number of pertussis notifications by week reported, 2010–2015



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 2015. 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 and persisted through 2012 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 1997–2014.

Figure 2: Number of pertussis notifications and hospitalisations by calendar month-year, 1998–2015



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 pertussis notifications and rates by age for the first quarter. Pertussis rates varied across age groups. Infants aged less than 1 year had the highest rate (35.7 per 100,000 population, 21 cases), followed by the 1–4 years (8.8 per 100,000 population, 22 cases) age group.

Of the 208 cases notified since January 2015, 5 (2.4%) were infants aged less than 6 weeks. Figure 3 shows the cumulative notification rate of pertussis cases by age group and ethnicity in 2015.

Table 1: Number of pertussis notifications and rate (cases per 100,000 population) by age group, January–March 2015

Age group (years)	2015[1] All cases[2]	Rate[3]	Hosp[4]	%[5]
<1	21	35.7	9	42.9
1–4	22	8.8	0	0.0
5–9	22	7.2	0	0.0
10–14	13	4.4	1	7.7
15–19	9	2.9	0	0.0
20–29	29	4.7	0	0.0
30–39	18	3.3	3	16.7
40–49	27	4.3	2	7.4
50–59	34	5.7	1	2.9
60–69	9	2.0	0	0.0
70+	4	-	1	25.0
Overall	208	4.6	17	8.2

[1] Cumulative notifications January–March 2015.
[2] Includes confirmed, probable and suspect cases only.
[3] Rate of pertussis cases per 100,000 population calculated using 2014 mid-year population estimates. Where fewer than five cases have been notified a rate has not been calculated.
[4] Number of notifications that were hospitalised.
[5] Percentage of notifications that were hospitalised.

Ethnicity

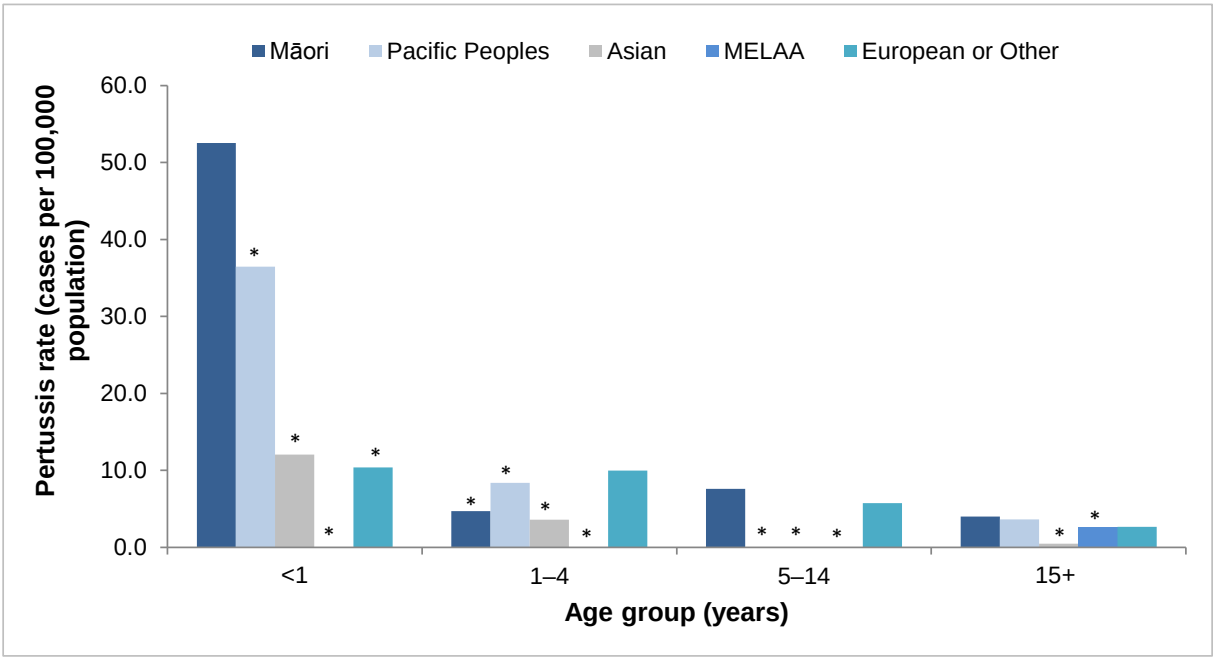
Pertussis notifications and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European or Other ethnic group had the highest numbers reported in the first quarter of 2015 (98 cases). The ethnic group with the highest notification rate was Māori (5.9 per 100,000, 40 cases), followed by the Pacific Peoples (4.0 per 100,000, 11 cases) and European or Other (3.3 per 100,000, 98 cases) ethnic groups.

Table 2: Number of pertussis notifications and rate (cases per 100,000 population) by ethnicity (prioritised), January–March 2015

			2015[1]			
Ethnicity	**All cases[2]**	**Rate[3]**	**Hosp[4]**	**%[5]**	**<1 year[6]**	**Rate[3]**
Māori	40	5.9	8	20.0	8	52.5
Pacific Peoples	11	4.0	4	36.4	2	-
Asian	4	-	0	0.0	1	-
MELAA	1	-	0	0.0	0	-
European or Other	98	3.3	3	3.1	3	-
Unknown	54	-	2	-	7	-
Overall	208	4.6	17	8.2	21	35.7

[1] Cumulative notifications January–March 2015.
[2] Includes confirmed, probable and suspect cases only.
[3] 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 2014 mid-year population estimates from Statistics New Zealand. Where fewer than five cases have been notified a rate has not been calculated.
[4] Number of notifications that were hospitalised.
[5] Percentage of notifications that were hospitalised.
[6] Number of notifications in the <1 year age group.

Figure 3: Pertussis rate (cases per 100,000 population) by age group and ethnicity, January–March 2015



Note: Notifications January–March 2015, 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 2014 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 2003–2014. 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.

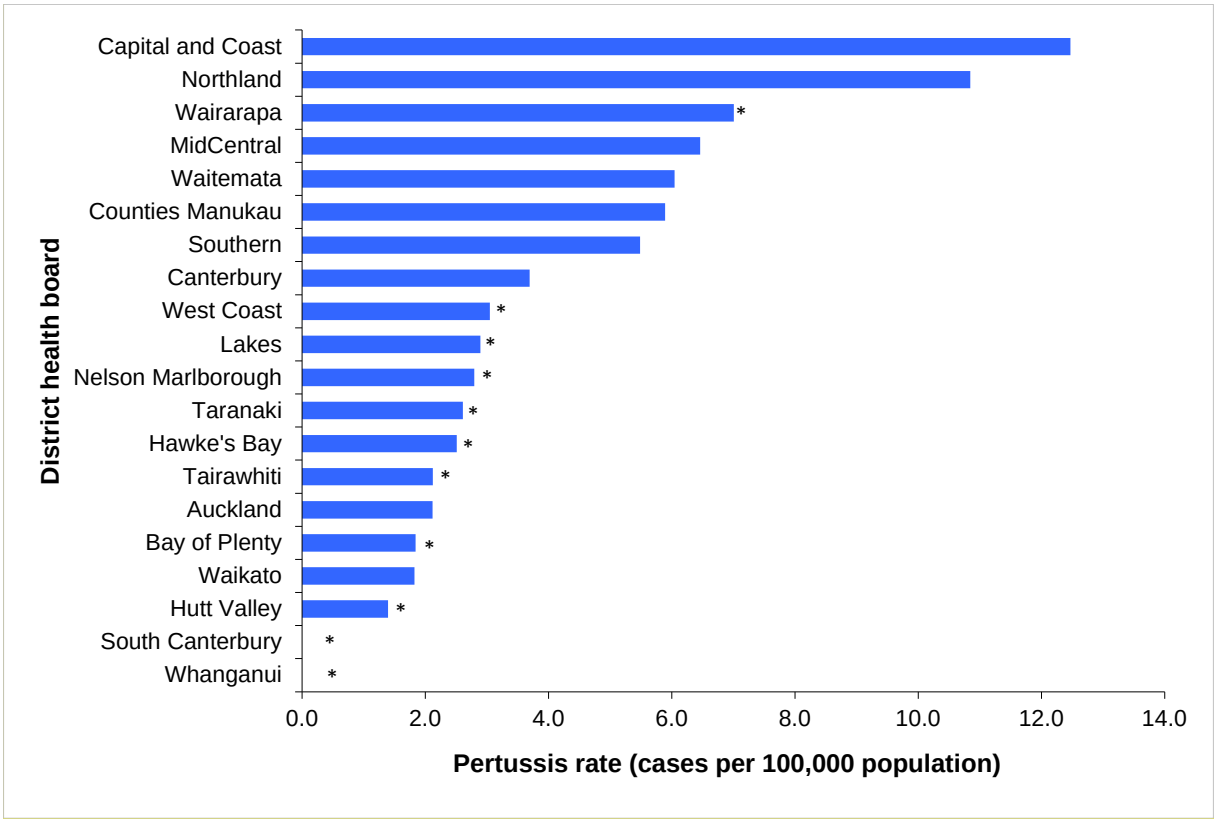
Hospitalisations and deaths

The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 4. There have been 17 hospitalisations recorded in EpiSurv during the first quarter of 2015. Of these, 9 (52.9%) of these were infants aged less than one year including three cases aged less than 6 weeks. Of the 134 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (36.4%, 4/11), Māori (20.0%, 8/40) and European or Other (3.1%, 3/98). No deaths were reported.

District health board

The rates of pertussis notifications by DHB are shown in Figure 4 (and Table 4 in Appendix). In the first quarter, the highest number of cases was reported in Capital & Coast DHB (37 cases), followed by Waitemata (34 cases) and Counties Manukau (30 cases) DHBs. The highest notification rate was recorded in Capital & Coast DHB (12.5 per 100,000, 37 cases), followed by Northland (10.8 per 100,000, 18 cases) DHB. Cases in the less than 1 year age group by DHB are shown in Table 4 (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, January–March 2015



Note: Notifications for January–March 2015, includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100,000 population calculated using 2014 mid-year population estimates.
* Rate based on fewer than five cases.

Vaccination status of confirmed notifications

The vaccination status for confirmed pertussis cases is shown in Table 3 for the first quarter of 2015. Of the 128 confirmed cases reported during in the first quarter of 2015, 80 (62.5%) had a known vaccination status (Table 3). Of these, 35 were not vaccinated, including five cases aged less than 6 weeks and thus not eligible for vaccination. Two cases had received one dose of vaccine, six cases had received two doses, 16 cases had received three doses, 10 cases had received four doses, and three cases reported having completed pertussis vaccination. A further eight cases reported being vaccinated but no dose information was recorded.

Table 3: Vaccination status and age group of confirmed pertussis notifications, 2015[1]

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks[2]	5	0	0	0	0	0	0	5	0
6wks–2mths	7	0	0	0	0	0	1	5	1
3–4mths	4	0	3	0	0	0	0	1	0
5mths–3yrs	18	1	0	11	0	0	0	5	1
4–10yrs	26	0	3	3	8	1	1	7	3
11+ yrs	68	1	0	2	2	2	6	12	43
Total	128	2	6	16	10	3	8	35	48

[1] Cumulative notifications January–March 2015.
Note: Vaccination status has been extracted from EpiSurv. Health professionals may use a range of sources to update vaccination status including the National Immunisation Register, parental recall and Well Child book records.
[2] Children aged <6 weeks are not eligible for immunisation.

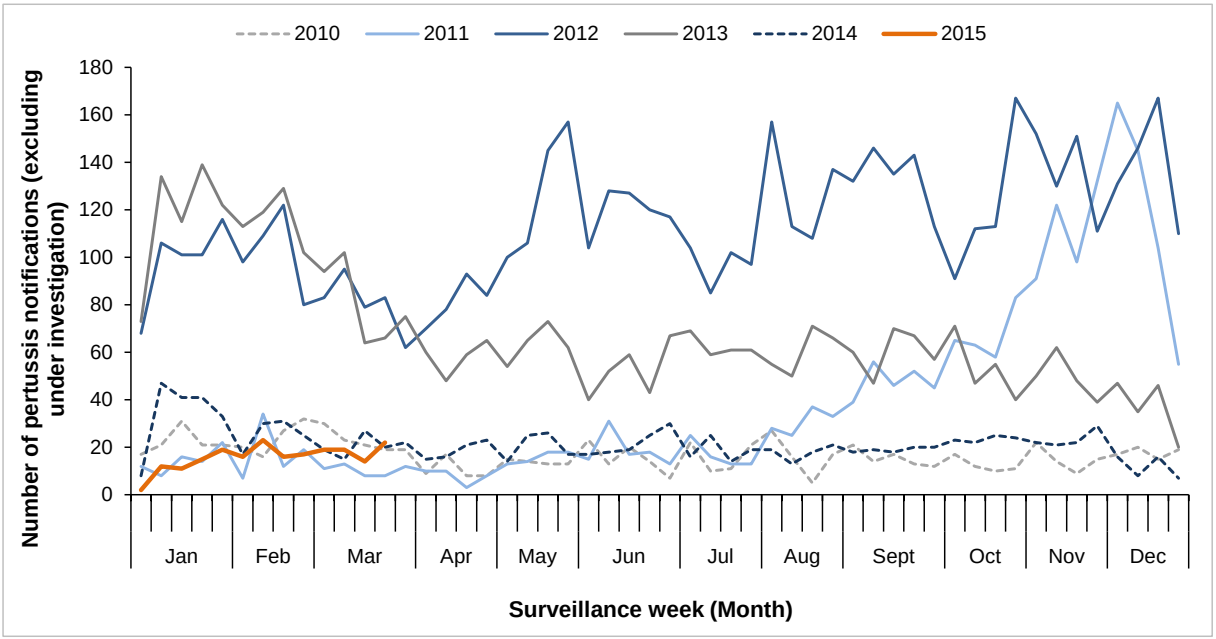
Appendix

Table 4: Number of pertussis notifications and rate (cases per 100,000 population) by district health board, January–March 2015

	2015[1]				
District health board	All cases[2]	Rate[3]	Hosp[4]	%[5]	<1 year[6]
Northland	18	10.8	2	11.1	3
Waitemata	34	6.0	1	2.9	4
Auckland	10	2.1	0	0.0	3
Counties Manukau	30	5.9	7	23.3	3
Waikato	7	1.8	1	14.3	0
Lakes	3	-	1	33.3	1
Bay of Plenty	4	-	1	25.0	1
Tairawhiti	1	-	0	0.0	1
Taranaki	3	-	0	0.0	0
Hawke's Bay	4	-	1	25.0	1
Whanganui	0	-	0	0.0	0
MidCentral	11	6.5	0	0.0	0
Hutt Valley	2	-	1	50.0	1
Capital & Coast	37	12.5	1	2.7	2
Wairarapa	3	-	0	0.0	1
Nelson Marlborough	4	-	0	0.0	0
West Coast	1	-	0	0.0	0
Canterbury	19	3.7	1	5.3	0
South Canterbury	0	-	0	0.0	0
Southern	17	5.5	0	0.0	0
Overall	208	4.6	17	8.2	21

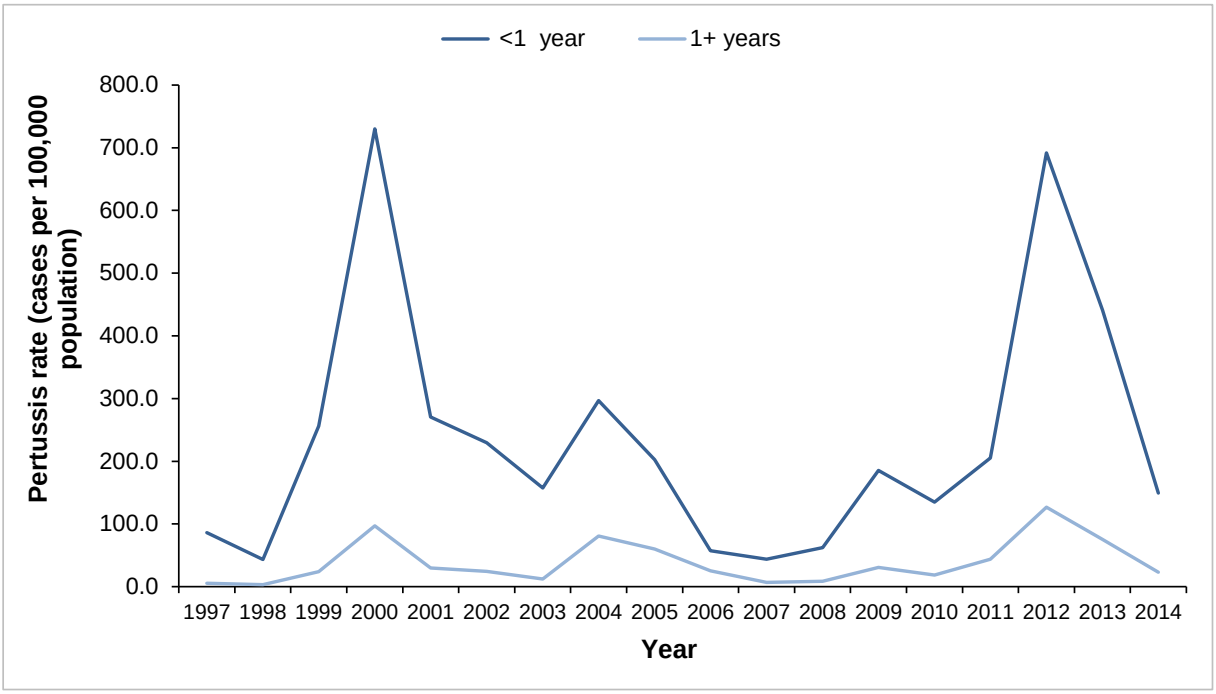
[1] Cumulative notifications January–March 2015.
[2] Includes confirmed, probable and suspect cases only.
[3] Rate of pertussis cases per 100,000 population calculated using 2014 mid-year population estimates, rates have not been calculated where fewer than five cases were notified.
[4] Number of notifications that were hospitalised.
[5] Percentage of notifications that were hospitalised.
[6] Number of cases in the <1 year age group.

Figure 5: Comparative trend of the number of pertussis notifications by week reported, 2010–2015



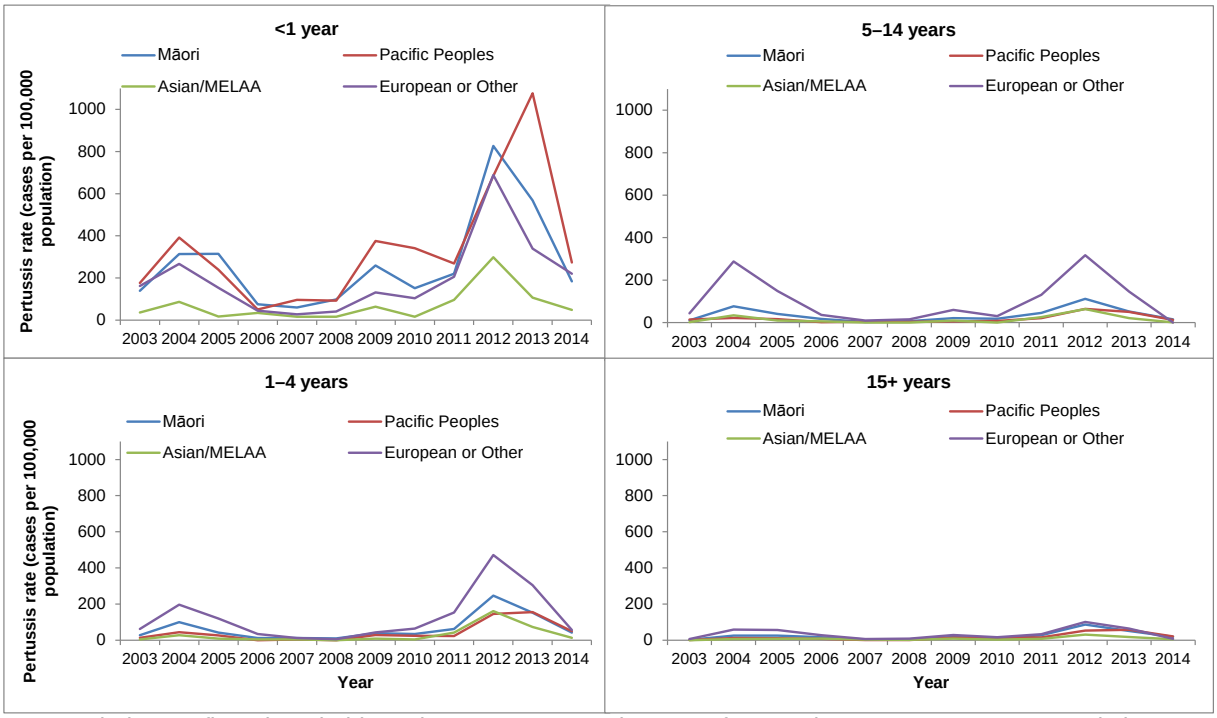
Note: Includes confirmed, probable and suspect cases only.

Figure 6: Pertussis rate (cases per 100,000 population) by age group (<1 year vs. 1+ years), 1997–2014



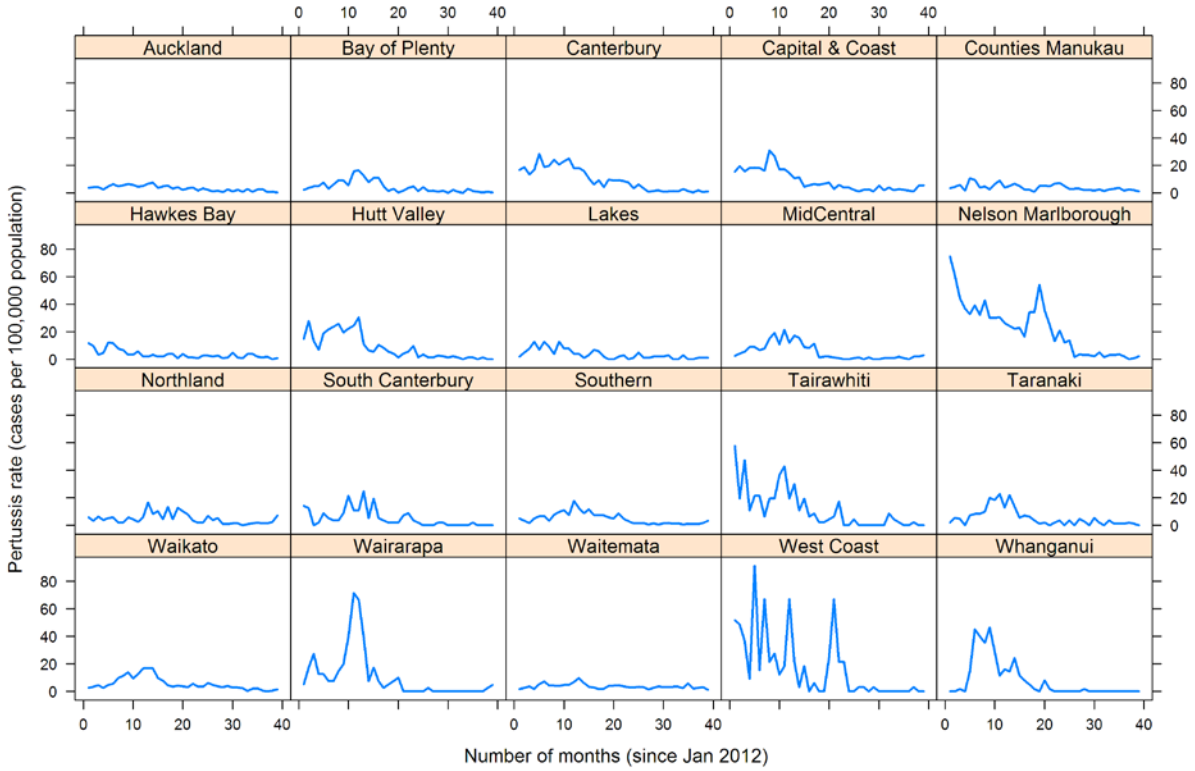
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100,000 population calculated using mid-year population estimates.

Figure 7: Trends in pertussis rates (cases per 100,000 population) by age group and ethnicity, 2003–2014



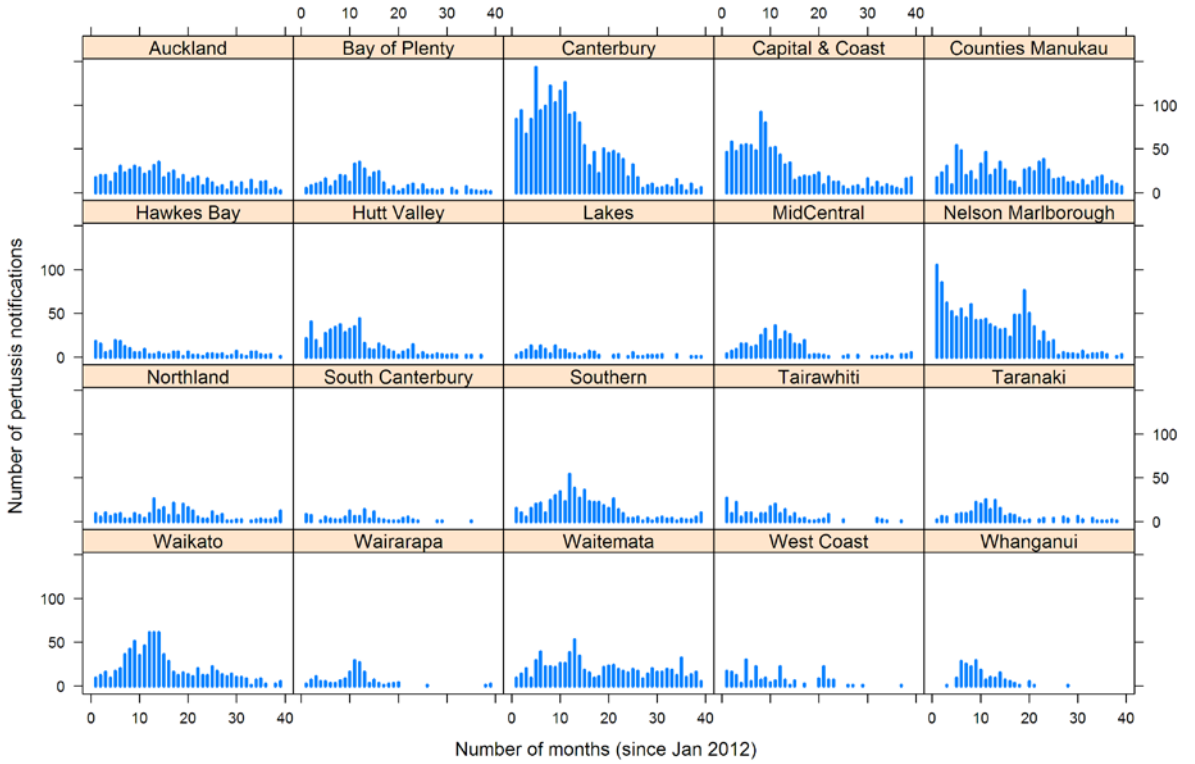
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100,000 population calculated using mid-year population estimates.

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 5 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 5 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