

PERTUSSIS REPORT

July–September 2015

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service staff as at 5 October 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 third quarter (July–September) of 2015, 462 cases of pertussis were notified, including 195 confirmed, 226 probable, 31 suspect, and 10 cases still under investigation. The number of cases reported in the third quarter was higher than the previous quarter (April–June 2015, 236 cases). Twenty-four (5.2%) of the notified cases were aged less than 1 year. Thirty-five cases were hospitalised and no deaths were reported. Weekly notifications during the third quarter were considerably lower than for the third quarter of 2012 and higher than 2014 (Figure 1).

The highest number of cases (excluding cases still under investigation) was reported by Sothern DHB (125 cases), followed by Canterbury (105 cases) and Waitemata (40 cases) DHBs. The overall rate was 10.0 per 100,000 (452 cases). The DHB with the highest rate was Southern DHB (40.3 per 100,000, 125 cases), followed by Whanganui (27.3 per 100,000, 17 cases) and Nelson Marlborough (23.8 per 100,000, 34 cases) DHBs.

Since 1 January 2015, 907 cases of pertussis have been notified, including 434 confirmed, 417 probable, 46 suspect, and 10 cases still under investigation. Sixty-three (6.9%) of the notified cases were aged less than 1 year. Sixty-nine cases were hospitalised and no deaths were reported.

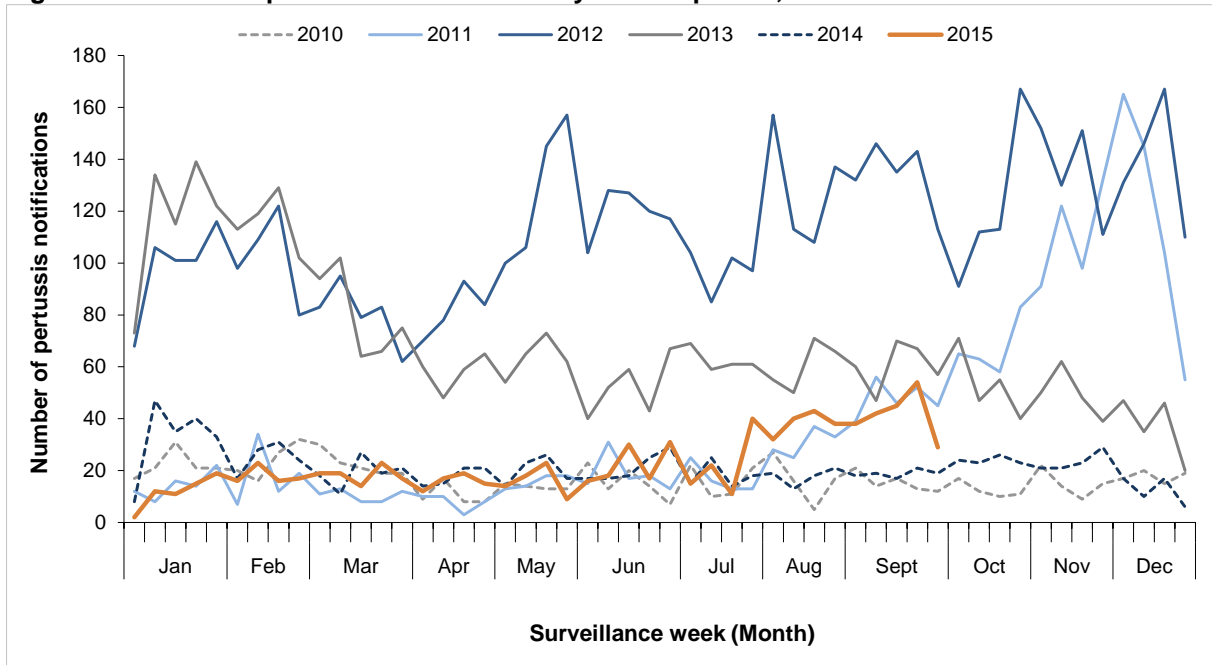
The highest number of cumulative cases (excluding cases still under investigation) was reported by Southern DHB (158 cases), followed by Waitemata (108 cases) and Counties Manukau (104 cases) DHBs. The overall cumulative rate was 19.9 per 100,000 (897 cases). The DHB with the highest cumulative rate was Southern DHB (51.0 per 100,000, 158 cases), followed by Nelson Marlborough (34.9 per 100,000, 50 cases) and Canterbury (29.9 per 100,000, 154 cases) DHBs.

This report summarises pertussis notifications for the third quarter of 2015 (quarterly and a cumulative 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 2010–2015 (to week ending 2 October). In 2015, notifications in the third quarter were considerably lower than for the third quarter of 2012 and higher than 2014. 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 weeks 44 (in October) and 51 (in December) 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.

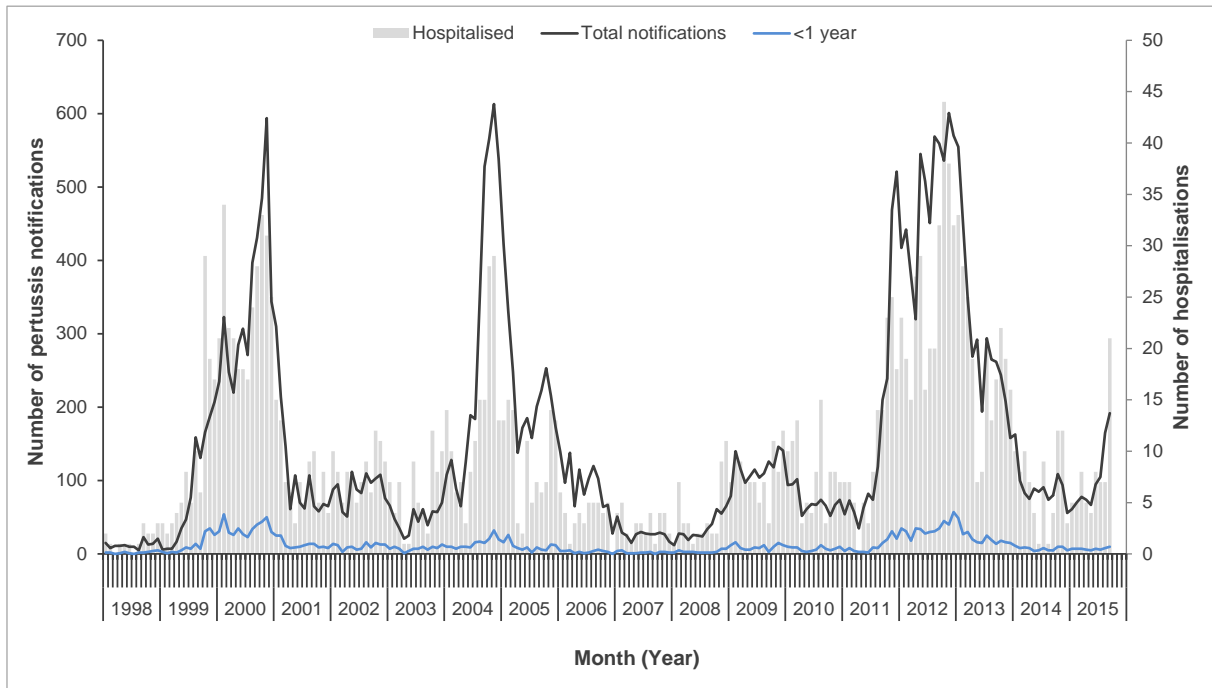
Figure 1: Number of pertussis notifications by week reported, 2010–2015



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 September 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. There has been an increasing trend in notifications since July 2015 primarily related to an outbreak in Southern DHB. 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, including new cases for the third quarter. Pertussis rates varied across age groups. Infants aged less than 1 year had the highest cumulative rate (107.0 per 100,000 population, 63 cases), followed by the 1–4 years (43.2 per 100,000 population, 108 cases) age group.

Of the 897 cases notified since January 2015, eight (0.9%) 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) and hospitalisations by age group, 2015

Age group (years)	2015 ¹				Jul–Sep 2015	
	All cases ²	Rate ³	Hosp ⁴	% ⁵	New cases ²	Hosp ⁴
<1	63	107.0	27	42.9	24	8
1–4	108	43.2	3	2.8	58	2
5–9	115	37.5	0	0.0	68	0
10–14	99	33.5	1	1.0	60	0
15–19	47	15.0	1	2.1	24	1
20–29	77	12.5	3	3.9	24	3
30–39	76	13.8	7	9.2	42	3
40–49	112	17.9	7	6.3	58	3
50–59	103	17.3	6	5.8	41	4
60–69	59	12.8	6	10.2	34	5
70+	37	8.5	8	21.6	18	5
Unknown	1	-	0	-	1	0
Overall	897	19.9	69	7.7	452	34

¹ Cumulative notifications January–September 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 third quarter of 2015 (339 cases).

The ethnic group with the highest cumulative notification rate was Pacific peoples (23.0 per 100,000, 64 cases), followed by the Māori (20.9 per 100,000, 141 cases) and European or Other (20.0 per 100,000, 598 cases) ethnic groups.

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

Ethnicity	2015 ¹						Jul–Sep 2015		
	All cases ²	Rate ³	Hosp ⁴	% ⁵	<1 year ⁶	Rate ³	New cases ²	Hosp ⁴	<1 year ⁶
Māori	141	20.9	21	14.9	26	170.8	41	7	7
Pacific peoples	64	23.0	16	25.0	11	200.6	16	6	2
Asian	34	6.6	6	17.6	3	-	17	4	1
MELAA	5	10.0	1	20.0	1	-	3	1	1
European or Other	598	20.0	20	3.3	20	69.1	339	12	12
Unknown	55	-	5	-	2	-	36	4	1
Overall	897	19.9	69	7.7	63	107.0	452	34	24

¹ Cumulative notifications January–September 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.

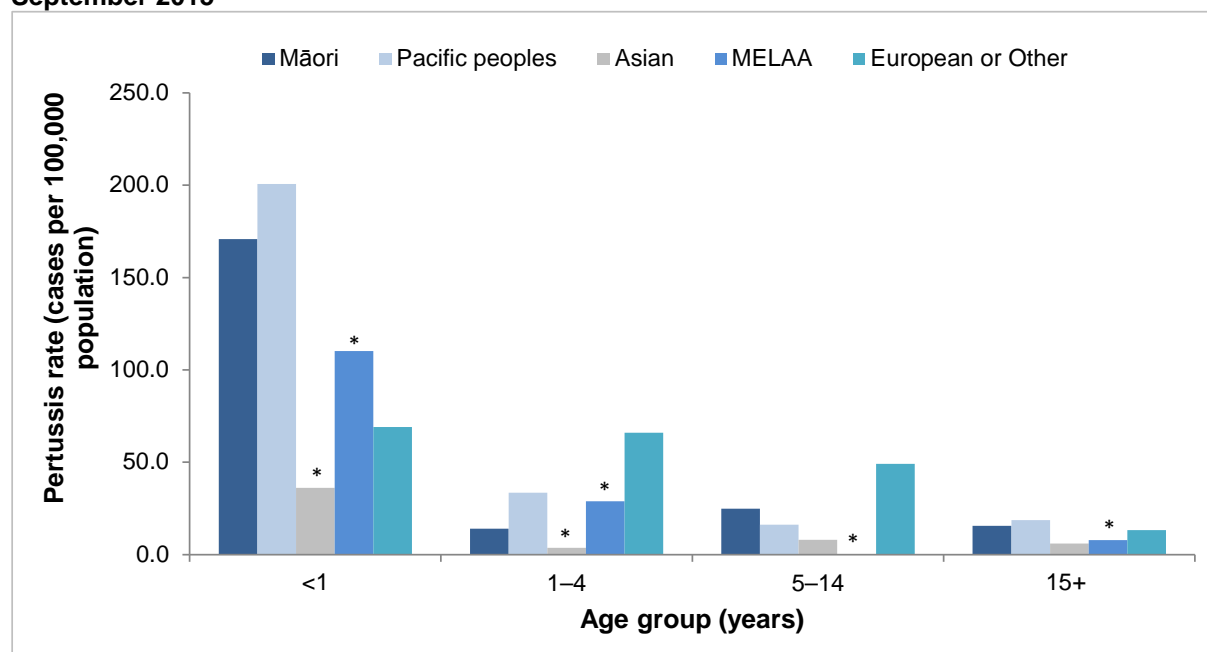
⁴ Number of notifications that were hospitalised.

⁵ Percentage of notifications that were hospitalised.

⁶ Number of notifications in the <1 year age group.

MELAA: Middle Eastern/Latin American/African.

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



Note: Notifications January–September 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.

MELAA: Middle Eastern/Latin American/African.

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

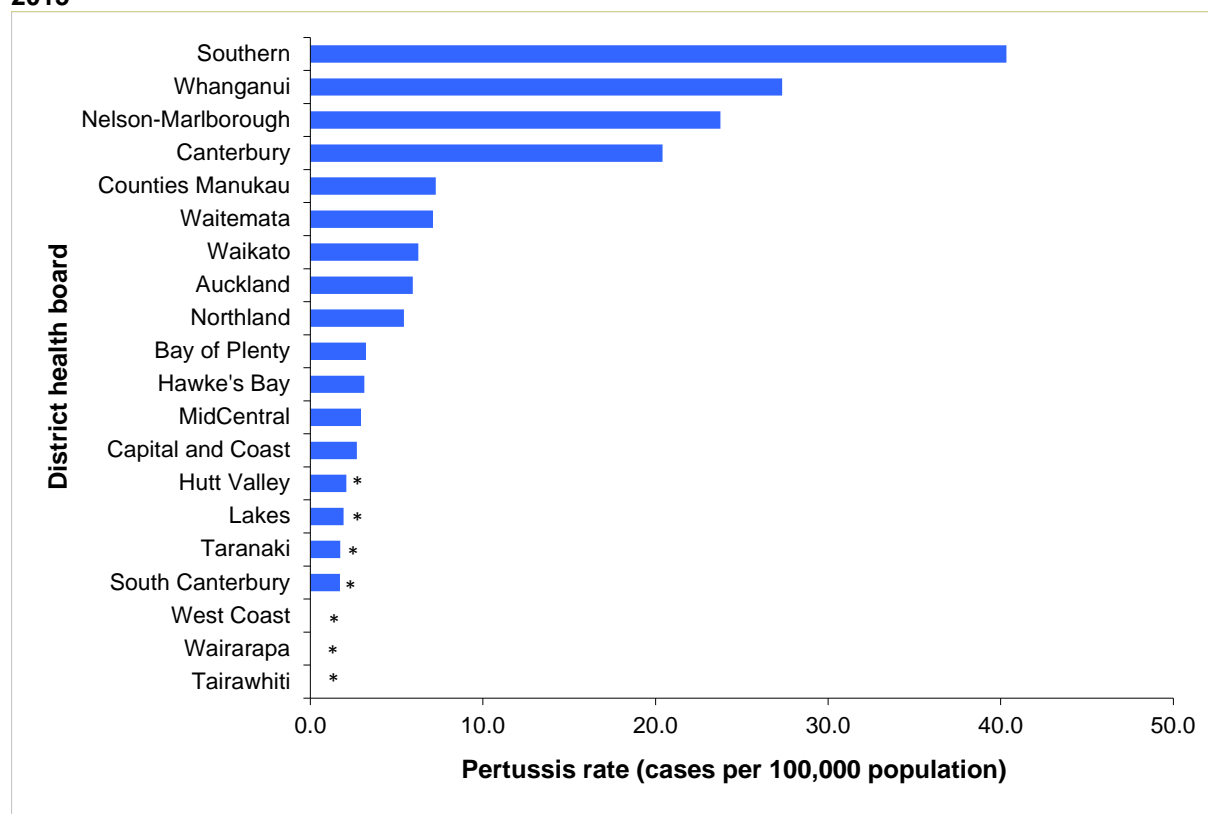
The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5. During the third quarter of 2015 there were 34 hospitalisations recorded in EpiSurv. Of these, eight (23.5%) were infants aged less than one year including one case aged less than 6 weeks. Of the 388 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific peoples (54.5%, 6/11), MELAA (50.0%, 1/2), Asian (26.7%, 4/15), Māori (18.9%, 7/37), European or Other (3.7%, 12/323).

No deaths were reported in the third quarter of 2015.

District health board

The rates of pertussis notifications by DHB are shown in Figure 4 (and Table 5 in Appendix). In the third quarter, the highest number of cases was reported in Southern DHB (125 cases), followed by Canterbury (105 cases) and Waitemata (40 cases) DHBs. The highest notification rate was recorded in Southern DHB (40.3 per 100,000, 125 cases), followed by Whanganui (27.3 per 100,000, 17 cases) and Nelson Marlborough (23.8 per 100,000, 34 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, July–September 2015



Note: Notifications for July–September 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 and 4 for the third quarter and 2015, respectively. Of the 195 confirmed cases reported during the third quarter of 2015, 129 (66.2%) had a known vaccination status (Table 3). Of these, 48 were not vaccinated, including two cases aged less than 6 weeks and thus not eligible for vaccination. Twelve cases had received one dose of vaccine, three cases had received two doses, 15 cases had received three doses, 28 cases had received four doses, and nine cases reported having completed pertussis vaccination. A further 14 cases reported being vaccinated but no dose information was recorded.

Table 3: Vaccination status and age group of confirmed pertussis notifications, July–September 2015

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks ²	2	0	0	0	0	0	0	2	0
6wks–2mths	7	5	0	0	0	0	0	1	1
3–4mths	4	1	2	1	0	0	0	0	0
5mths–3yrs	23	1	0	12	1	0	1	7	1
4–10yrs	55	1	1	2	26	0	7	11	7
11+yrs	104	4	0	0	1	9	6	27	57
Total	195	12	3	15	28	9	14	48	66

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

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.

Of the 434 confirmed cases reported during January to September of 2015, 285 (65.7%) had a known vaccination status (Table 4). Of these, 115 were not vaccinated, including eight cases aged less than 6 weeks and thus not eligible for vaccination. Twenty-four cases had received one dose of vaccine, 12 cases had received two doses, 42 cases had received three doses, 46 cases had received four doses, and 17 cases reported having completed pertussis vaccination. A further 29 cases reported being vaccinated but no dose information was recorded.

Table 4: Vaccination status and age group of confirmed pertussis notifications, 2015¹

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks ²	8	0	0	0	0	0	0	8	0
6wks–2mths	21	10	0	0	0	0	1	9	1
3–4mths	14	4	7	1	0	0	0	2	0
5mths–3yrs	54	3	0	30	1	0	1	17	2
4–10yrs	100	2	4	9	41	1	9	23	11
11+yrs	237	5	1	2	4	16	18	56	135
Total	434	24	12	42	46	17	29	115	149

¹ Cumulative notifications January–September 2015.

² Children aged <6 weeks are not eligible for immunisation.

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.

Appendix

Table 5: Number of pertussis notifications and rate (cases per 100,000 population) and hospitalisations by district health board, 2015

District health board	2015 ¹					Jul–Sep 2015		
	All cases ²	Rate ³	Hosp ⁴	% ⁵	<1 year ⁶	New cases ²	Hosp ⁴	<1 year ⁶
Northland	33	19.9	5	15.2	7	9	2	2
Waitemata	108	19.2	10	9.3	8	40	6	3
Auckland	58	12.3	6	10.3	3	28	3	0
Counties Manukau	104	20.4	23	22.1	12	37	11	2
Waikato	50	13.0	8	16.0	2	24	5	1
Lakes	11	10.6	1	9.1	1	2	0	0
Bay of Plenty	15	6.9	1	6.7	1	7	0	0
Tairāwhiti	5	10.6	0	0.0	0	0	0	0
Taranaki	6	5.2	0	0.0	0	2	0	0
Hawke's Bay	15	9.4	3	20.0	5	5	1	2
Whanganui	17	27.3	0	0.0	2	17	0	2
MidCentral	20	11.7	2	10.0	1	5	2	1
Hutt Valley	10	7.0	2	20.0	1	3	1	0
Capital & Coast	74	24.9	4	5.4	6	8	1	1
Wairarapa	5	11.7	0	0.0	1	0	0	0
Nelson Marlborough	50	34.9	0	0.0	5	34	0	4
West Coast	1	-	0	0.0	0	0	0	0
Canterbury	154	29.9	4	2.6	3	105	2	3
South Canterbury	3	-	0	0.0	4	1	0	0
Southern	158	51.0	0	0.0	0	125	0	3
Overall	897	19.9	69	7.7	62	452	34	24

¹ Cumulative notifications January–September 2015.

² Includes confirmed, probable and suspect cases only.

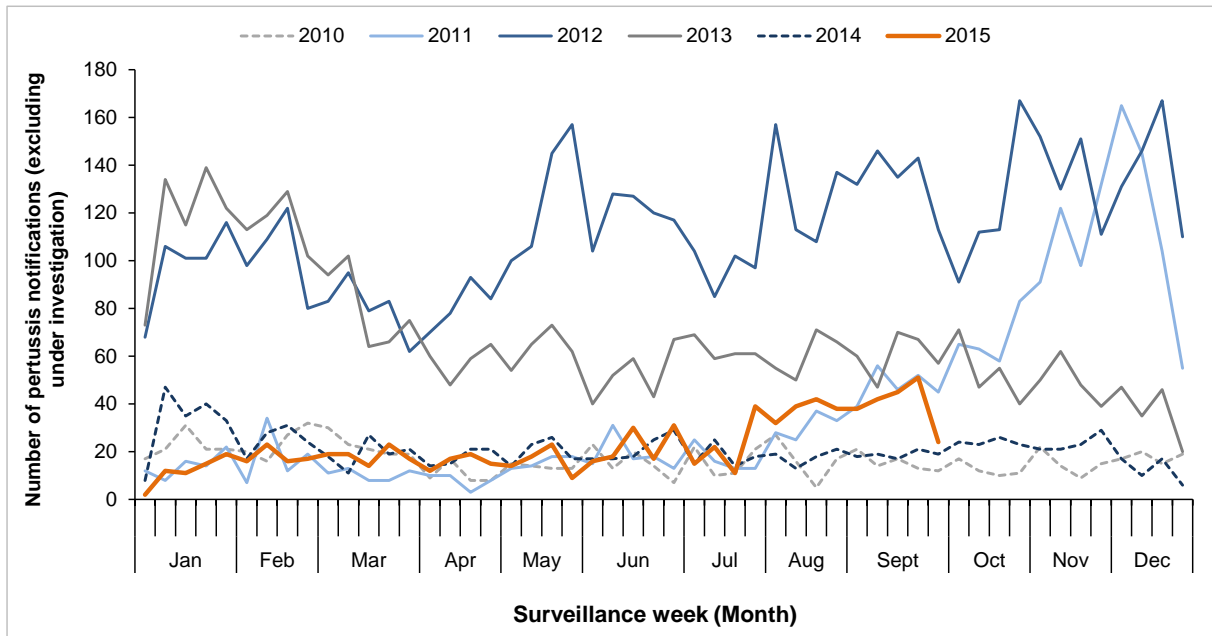
³ Rate of pertussis cases per 100,000 population calculated using 2014 mid-year population estimates, rates have not been calculated where fewer than five cases were notified.

⁴ Number of notifications that were hospitalised.

⁵ Percentage of notifications that were hospitalised.

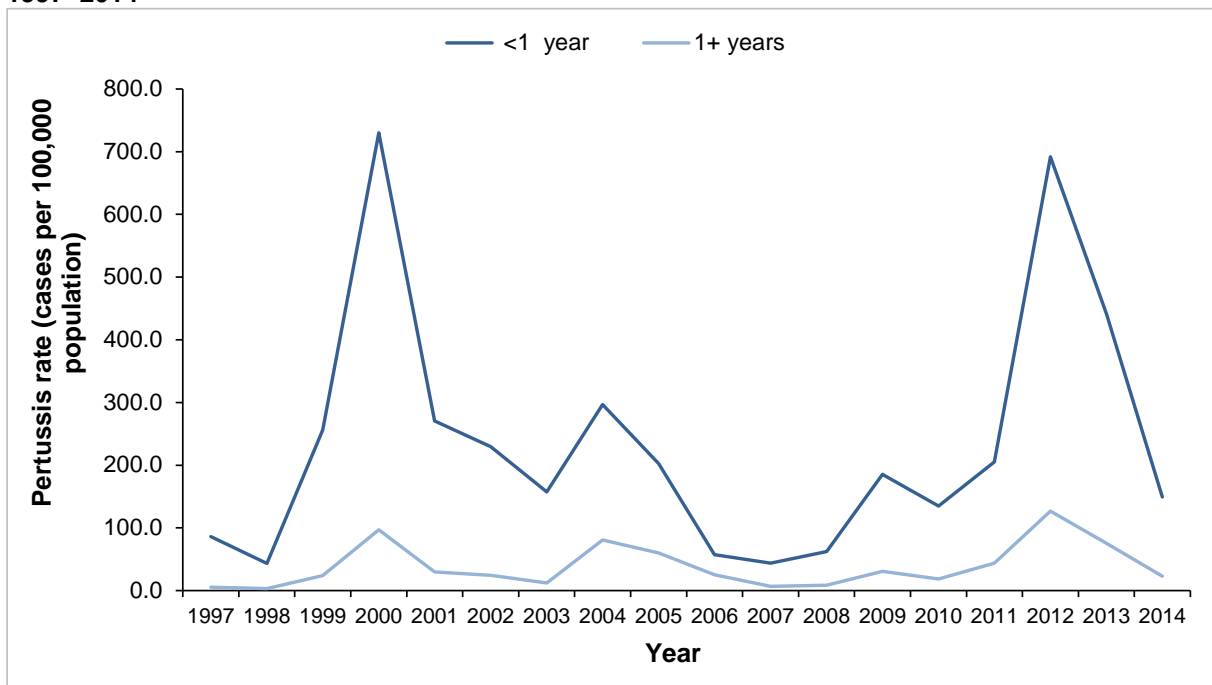
⁶ Number of cases in the <1 year age group.

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



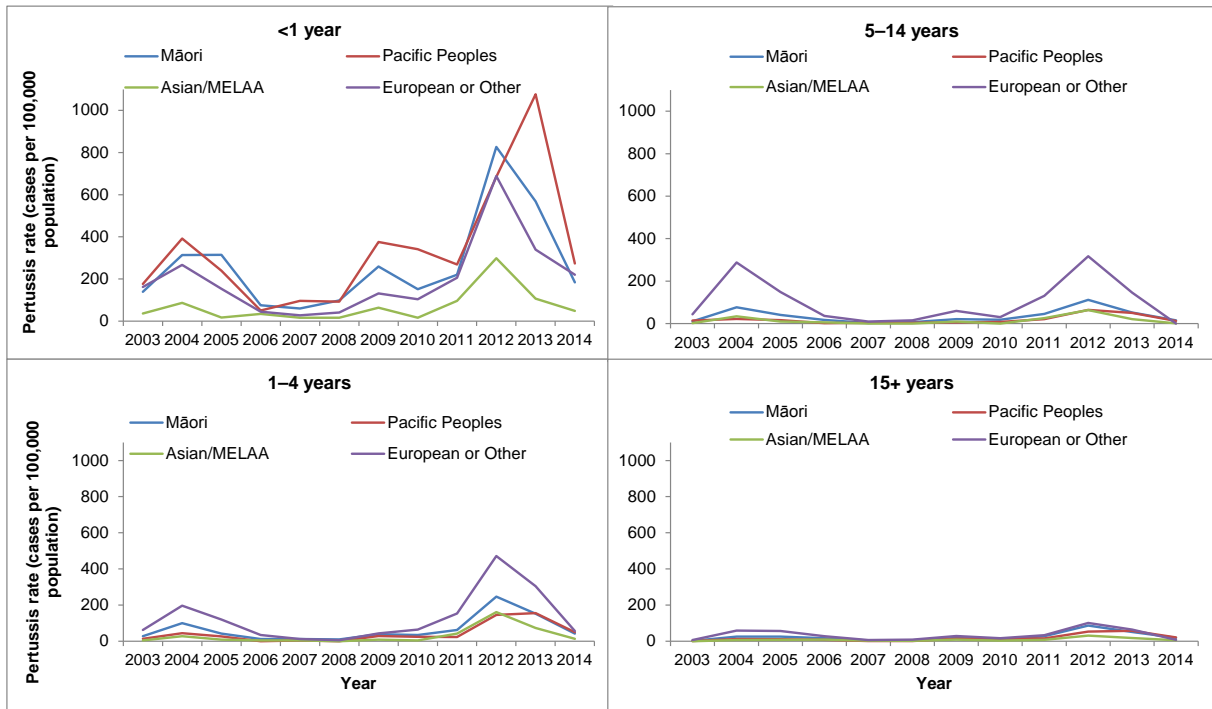
Note: Includes confirmed, probable and suspect cases only.

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



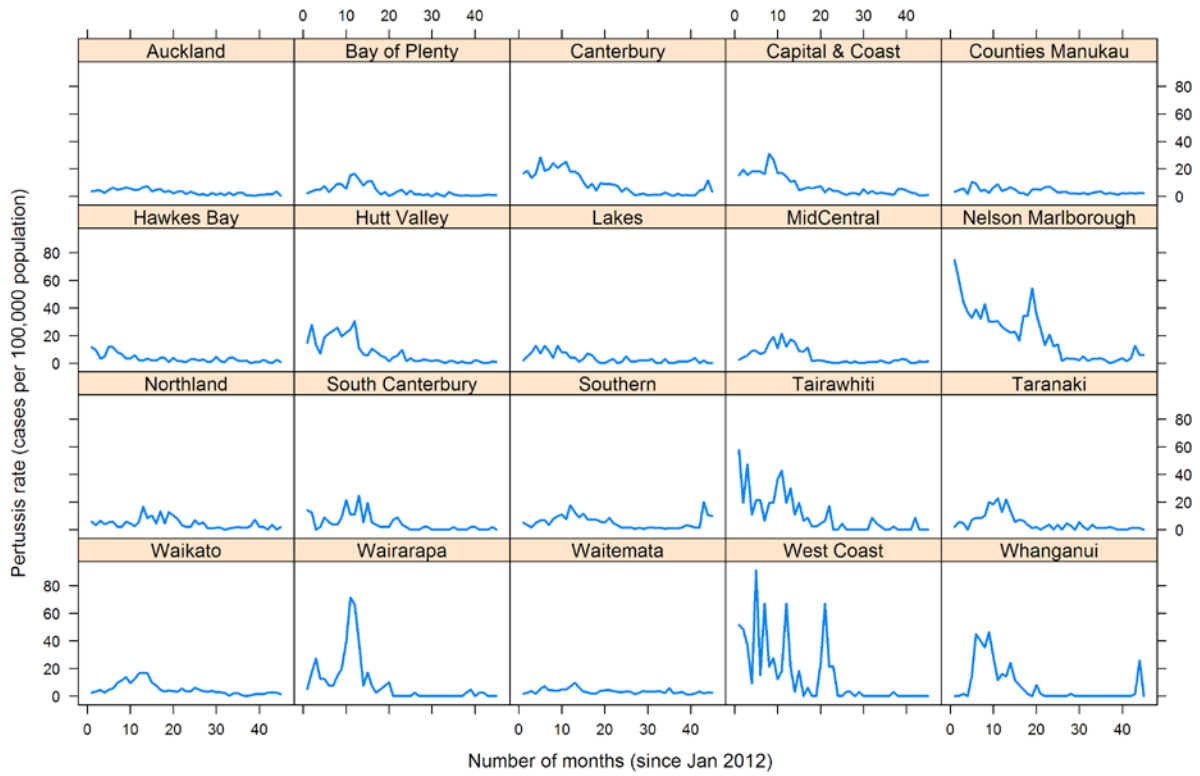
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100,000 population calculated using mid-year population estimates.

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



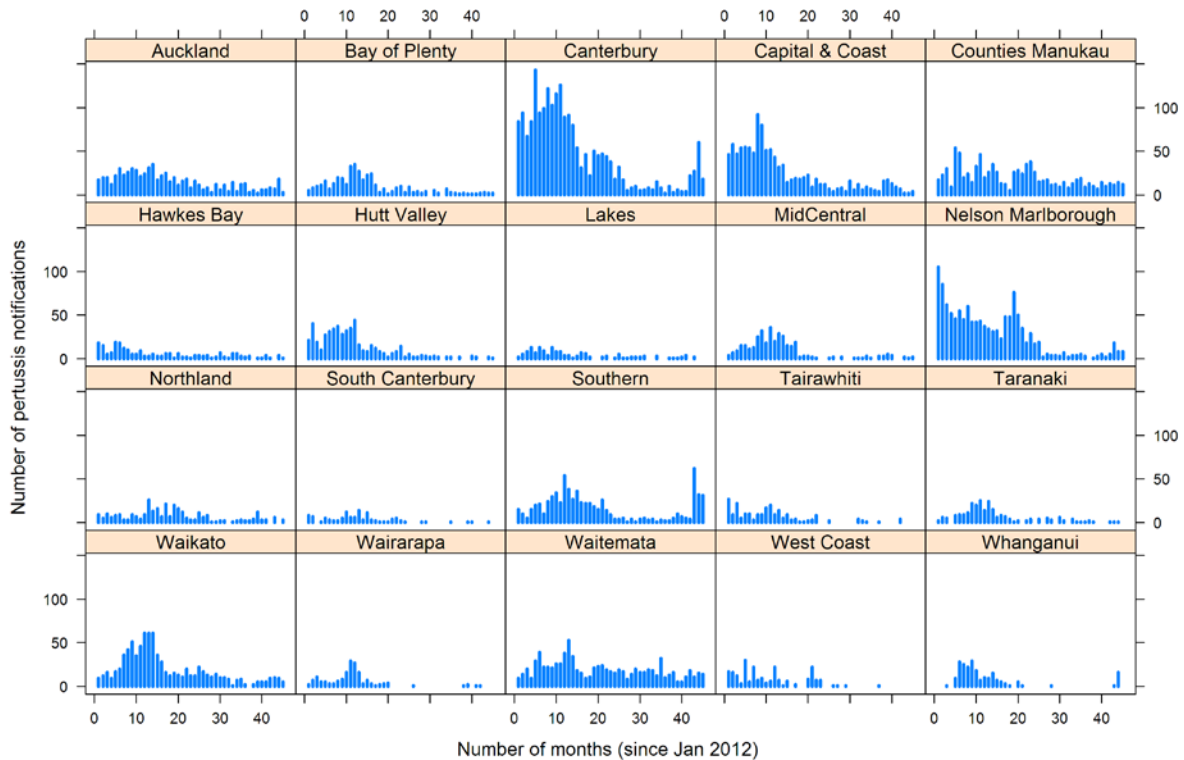
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100,000 population calculated using mid-year population estimates.

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 <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 5 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 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>