

PERTUSSIS REPORT

October–December 2014

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service staff as at 21 January 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 fourth quarter (October–December) of 2014, 264 cases of pertussis have been notified, including 122 confirmed, 128 probable, 5 suspect, and 9 cases still under investigation. The number of cases reported in the fourth quarter was slightly higher than the previous quarter (July–September 2014). Twenty-five (9.5%) of the notified cases were aged less than 1 year. Twenty-seven cases were hospitalised and no deaths were reported. Weekly notifications during the fourth quarter were considerably lower than for the fourth quarter of 2012 and 2013 (Figure 1).

The highest number of cases (excluding cases still under investigation) was reported by Waitemata DHB (54 cases), followed by Counties Manukau (45 cases) and Auckland (29 cases) DHBs. The overall rate was 5.7 per 100 000 (255 cases). The DHB with the highest rate was Waitemata (9.6 per 100 000, 54 cases), followed by Counties Manukau (8.7 per 100 000, 45 cases) and Nelson Marlborough (8.5 per 100 000, 12 cases) DHBs.

Since 1 January 2014, 1133 cases of pertussis have been notified, including 471 confirmed, 604 probable, 48 suspect, and 10 cases still under investigation. Eighty-nine (7.9%) of the notified cases were aged less than 1 year. Eighty-one cases were hospitalised and no deaths were reported.

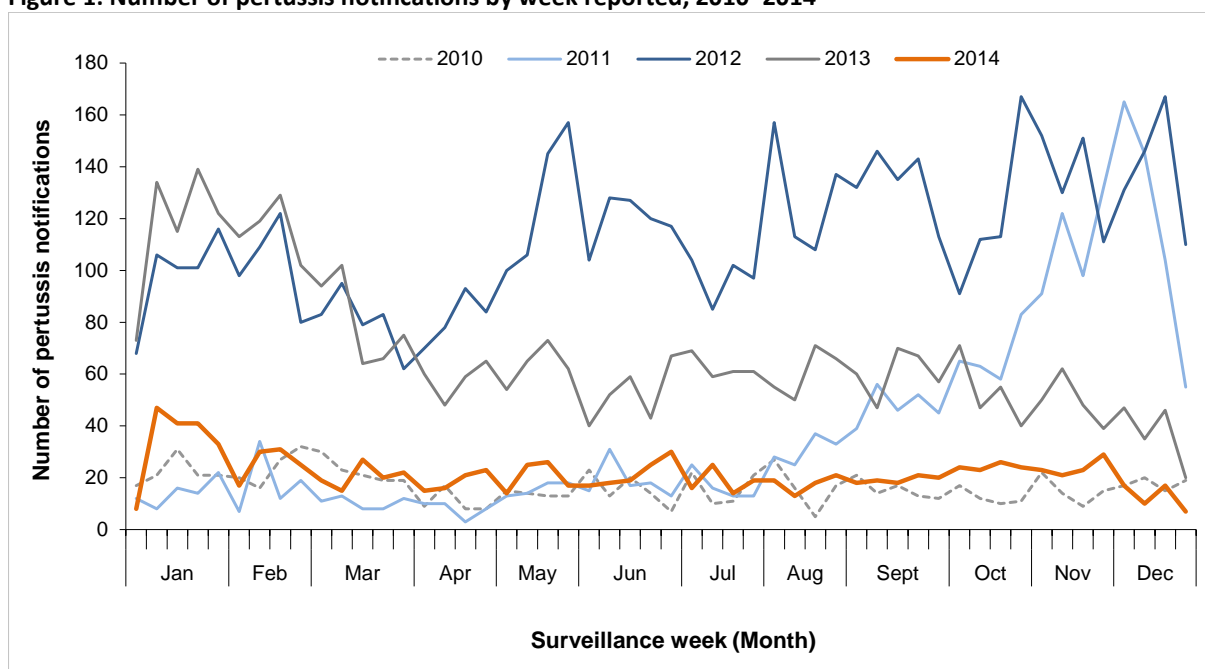
The highest number of cumulative cases (excluding cases still under investigation) was reported by Waitemata DHB (201 cases), followed by Counties Manukau (160 cases) and Waikato (123 cases) DHBs. The overall cumulative rate was 25.1 per 100 000 (1123 cases). The DHB with the highest cumulative rate was Nelson Marlborough (43.9 per 100 000, 62 cases), followed by Waitemata (35.8 per 100 000, 201 cases) and Waikato (33.0 per 100 000, 123 cases) DHBs.

This report summarises pertussis notifications for the fourth quarter of 2014 (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 2010–2014 (to week ending 26 December). In 2014, notifications in the fourth 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.

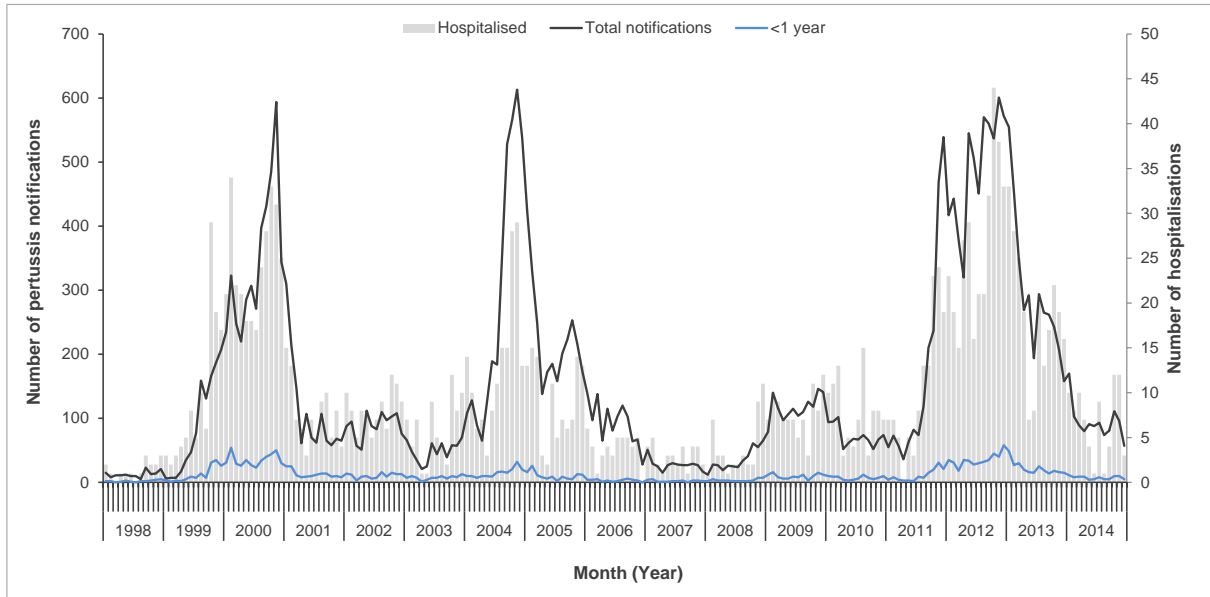
Figure 1: Number of pertussis notifications by week reported, 2010–2014



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 December 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 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 1997–2013.

Figure 2: Number of pertussis notifications and hospitalisations by calendar month-year, January 1998 to December 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 the fourth quarter. Pertussis rates varied across age groups. For cumulative notifications since January 2014, infants aged less than 1 year have the highest rate (145.3 per 100 000 population, 87 cases), followed by the 1–4 years (53.7 per 100 000 population, 133 cases) age group.

Of the 1123 cases notified since January 2014, 11 (1.0%) 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, 2014

Age group (years)	All cases ²	2014 ¹			Oct–Dec 2014	
		Rate ³	Hosp ⁴	% ⁵	New cases ²	Hosp ⁴
<1	87	145.3	35	40.2	23	14
1–4	133	53.7	10	7.5	28	2
5–9	76	25.5	4	5.3	19	1
10–14	57	20.0	1	1.8	8	0
15–19	43	14.1	0	0.0	11	0
20–29	118	18.5	3	2.5	35	1
30–39	132	23.6	8	6.1	25	1
40–49	167	27.0	4	2.4	37	1
50–59	127	21.8	3	2.4	24	0
60–69	107	24.1	5	4.7	23	1
70+	76	17.7	8	10.5	22	6
Overall	1123	25.1	81	7.2	255	27

¹ Cumulative notifications January to December 2014.

² Includes confirmed, probable and suspect cases only.

³ Rate of pertussis cases per 100 000 population calculated using 2013 mid-year population estimates. Where fewer than five cases have been notified a rate has not been calculated.

⁴ Number of hospitalised notifications.

⁵ Percentage of hospitalised notifications.

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 fourth quarter of 2014 (113 cases). Of the cumulative notifications, the ethnic-specific cumulative rates were highest for European or Other (23.6 per 100 000, 700 cases), followed by Pacific Peoples (23.5 per 100 000, 65 cases) and Māori (22.3 per 100 000, 149 cases).

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

Ethnicity	2014 ¹						Oct–Dec 2014		
	All cases ²	Rate ³	Hosp ⁴	% ⁵	<1 year ⁶	Rate ³	New cases ²	Hosp ⁴	<1 year ⁶
Māori	149	22.3	20	13.4	23	109.8	26	5	6
Pacific Peoples	65	23.5	16	24.6	13	179.4	14	5	3
Asian	28	5.4	2	7.1	2	-	7	0	1
MELAA	6	12.0	2	33.3	2	-	1	0	0
European or Other	700	23.6	34	4.9	36	101.9	113	12	5
Unknown	175	-	7	-	11	-	94	5	8
Overall	1123	25.1	81	7.2	87	105.2	255	27	23

¹ Cumulative notifications January to December 2014.

² Includes confirmed, probable and suspect cases only.

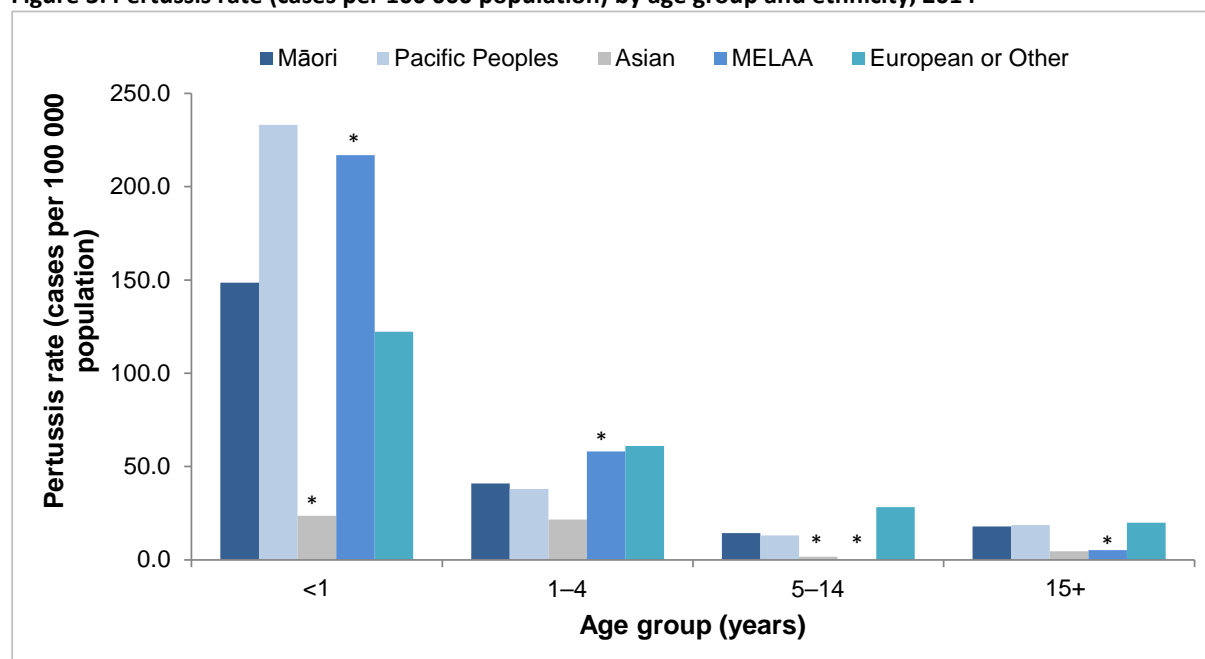
³ Rate of pertussis cases per 100 000 population. Denominator data used to determine disease rates for ethnic groups are based on the proportion of people in each ethnic group from the estimated resident 2013 Census population applied to the 2013 mid-year population estimates from Statistics New Zealand. Where fewer than five cases have been notified a rate has not been calculated.

⁴ Number of hospitalised notifications.

⁵ Percentage of hospitalised notifications.

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

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



Note: Notifications for January to December 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.
* Rates not calculated where case numbers were fewer than five.

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

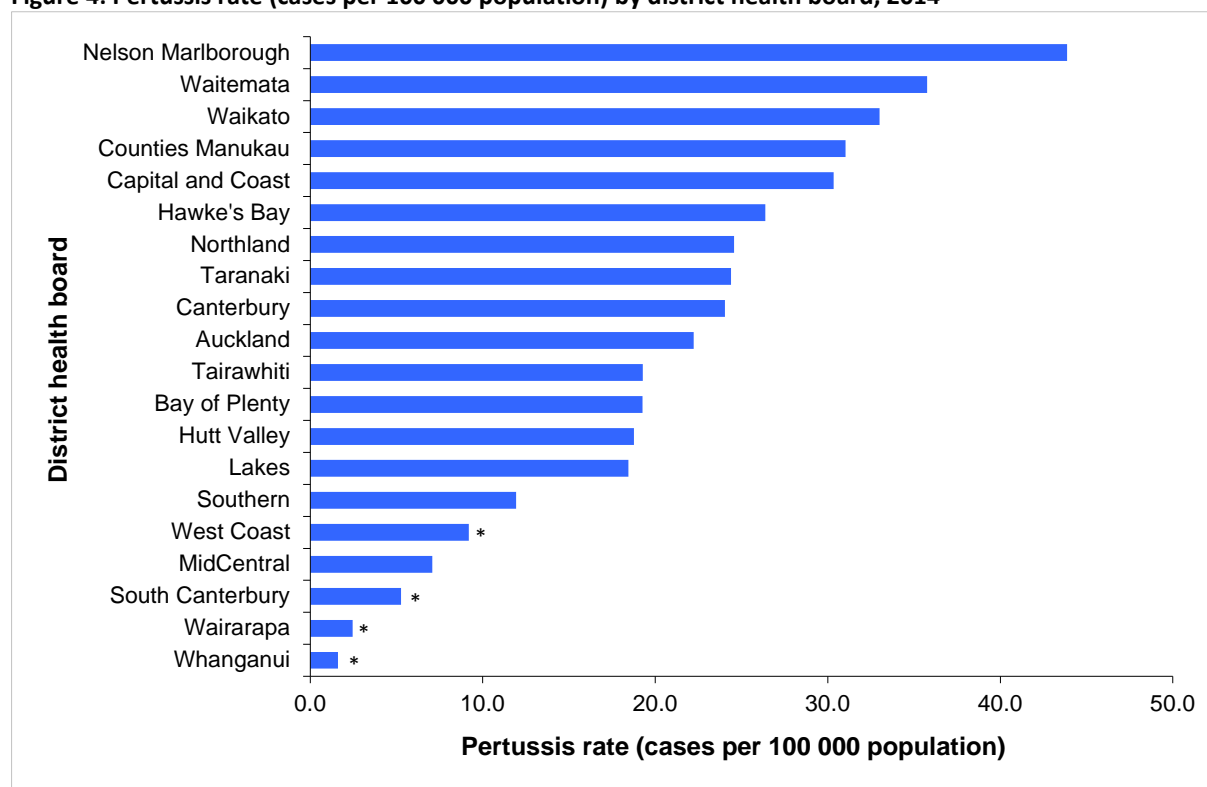
The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5. There have been 27 hospitalisations recorded in EpiSurv during the fourth quarter and 81 hospitalisations since 1 January 2014. In 2014, 35 (43.2%) of these were infants aged less than one year including nine cases aged less than six weeks. Of the 828 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: MELAA (50.0%, 2/4), Pacific Peoples (31.4%, 16/51), Māori (14.4%, 20/139), Asian (8.7%, 2/23), and European or Other (5.6%, 34/611). No deaths were reported.

District health board

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

In the fourth quarter, the highest number of cases was reported in Waitemata DHB (54 cases), followed by Counties Manukau (45 cases) DHB. The highest cumulative rate for 2014 was recorded in Nelson Marlborough DHB (43.9 per 100 000, 62 cases), followed by Waitemata (35.8 per 100 000, 201 cases) and Waikato (33.0 per 100 000, 123 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, 2014



Note: Notifications for January to December 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 the fourth quarter and 2014, respectively. Of the 122 confirmed cases reported in the fourth quarter, 60 (49.2%) had a known vaccination status. Of these, 31 were not vaccinated, including four cases aged less than 6 weeks and thus not eligible for vaccination. Six cases had received one dose of vaccine, one case had received two doses, nine cases had received three doses, five cases had received four doses, and one case reported having completed pertussis vaccination. Seven further cases reported being vaccinated but no dose information was recorded.

Table 3: Immunisation status of confirmed pertussis notifications, October–December 2014

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks ¹	4							4	
6wks–2mths	11	3					2	4	2
3–4mths	3	1							2
5mths–3yrs	17			9			1	5	2
4–10yrs	16				5		1	4	6
11+ yrs	71	2	1			1	3	14	50
Total	122	6	1	9	5	1	7	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.

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

Of the 471 confirmed cases reported during January to December of 2014, 242 (51.4%) had a known vaccination status (Table 4). Of these, 112 were not vaccinated, including nine cases aged less than 6 weeks and thus not eligible for vaccination. Twenty-seven cases had received one dose of vaccine, eight cases had received two doses, 48 cases had received three doses, 18 cases had received four doses, and six cases reported having completed pertussis vaccination. A further 23 cases reported being vaccinated but no dose information was recorded.

Table 4: Immunisation status of confirmed pertussis notifications, 2014¹

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks ²	9							9	
6wks–2mths	29	15					3	8	3
3–4mths	12	4	4					1	3
5mths–3yrs	82	1	2	44			4	27	4
4–10yrs	62			4	18	2	4	21	13
11+ yrs	277	7	2			4	12	46	206
Total	471	27	8	48	18	6	23	112	229

¹Cumulative notifications January to December 2014.

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.

²Children 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	All cases ²	Rate ³	2014 ¹			Oct-Dec 2014		
			Hosp ⁴	% ⁵	<1 year ⁶	New cases ²	Hosp ⁴	<1 year ⁶
Northland	39	24.6	1	2.6	3	7	0	0
Waitemata	201	35.8	12	6.0	16	54	2	4
Auckland	104	22.2	9	8.7	9	29	2	4
Counties Manukau	160	31.0	28	17.5	15	45	12	5
Waikato	123	33.0	10	8.1	10	17	3	2
Lakes	19	18.4	2	10.5	1	3	1	0
Bay of Plenty	41	19.3	4	9.8	4	12	1	2
Tairāwhiti	9	19.3	0	0.0	2	1	0	1
Taranaki	27	24.4	3	11.1	4	3	1	0
Hawke's Bay	41	26.4	3	7.3	3	11	1	1
Whanganui	1	-	0	0.0	0	0	0	0
MidCentral	12	7.1	2	16.7	4	4	2	2
Hutt Valley	27	18.8	1	3.7	1	4	0	0
Capital & Coast	91	30.3	2	2.2	8	21	1	2
Wairarapa	1	-	0	0.0	0	0	0	0
Nelson Marlborough	62	43.9	1	1.6	4	12	0	0
West Coast	3	-	0	0.0	0	0	0	0
Canterbury	122	24.0	2	1.6	2	25	0	0
South Canterbury	3	-	1	33.3	0	1	1	0
Southern	37	11.9	0	0.0	1	6	0	0
Overall	1123	25.1	81	7.2	87	255	27	23

¹ Cumulative notifications January to December 2014.

² Includes confirmed, probable and suspect cases only.

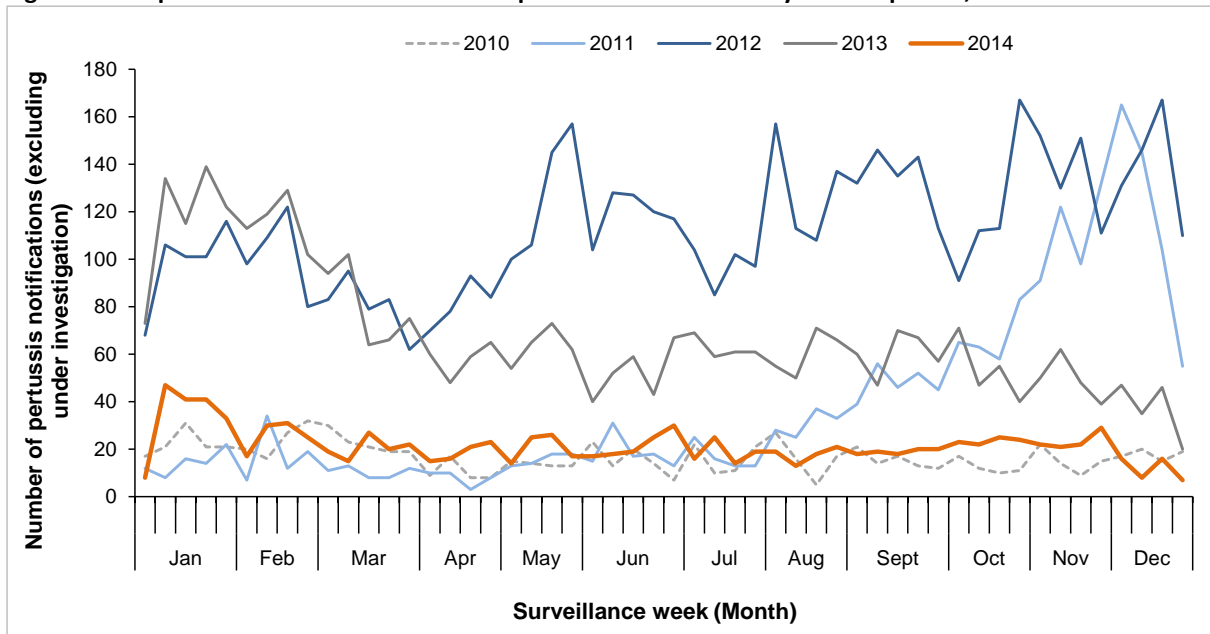
³ Rate of pertussis cases per 100 000 population calculated using 2013 mid-year population estimates, rates have not been calculated where fewer than five cases were notified.

⁴ Number of hospitalised notifications.

⁵ Percentage of hospitalised notifications.

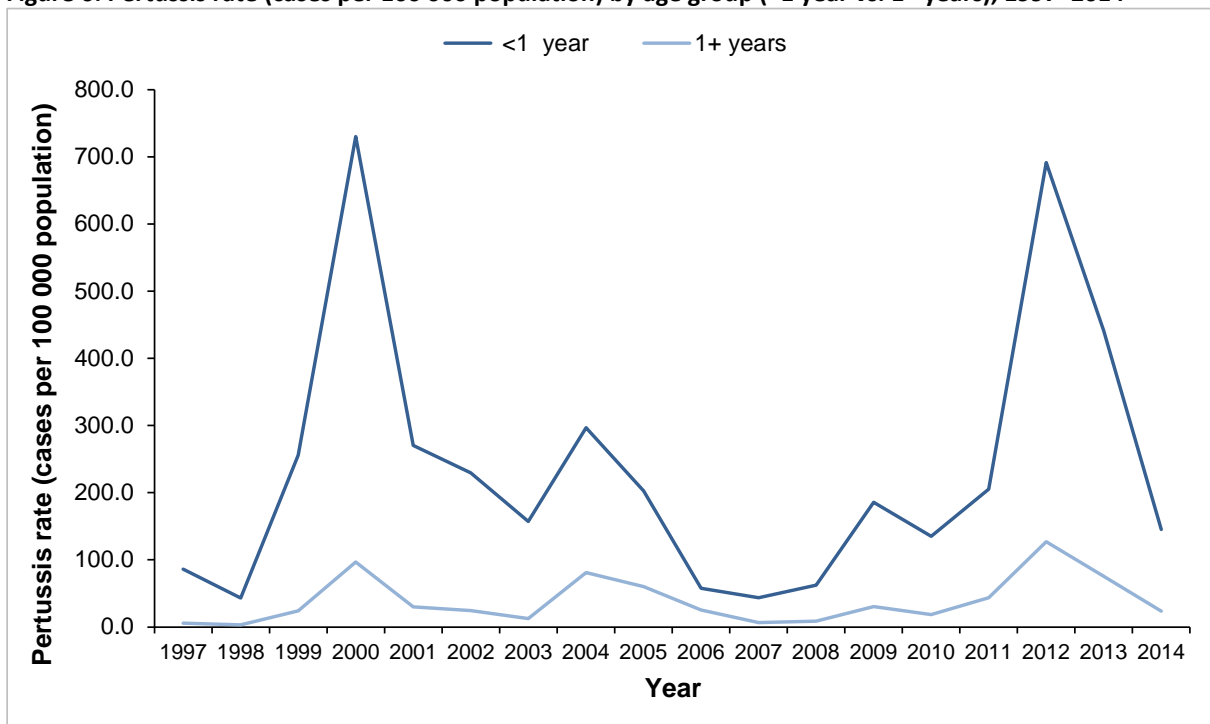
⁶ Number of cases in the <1 year age group.

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



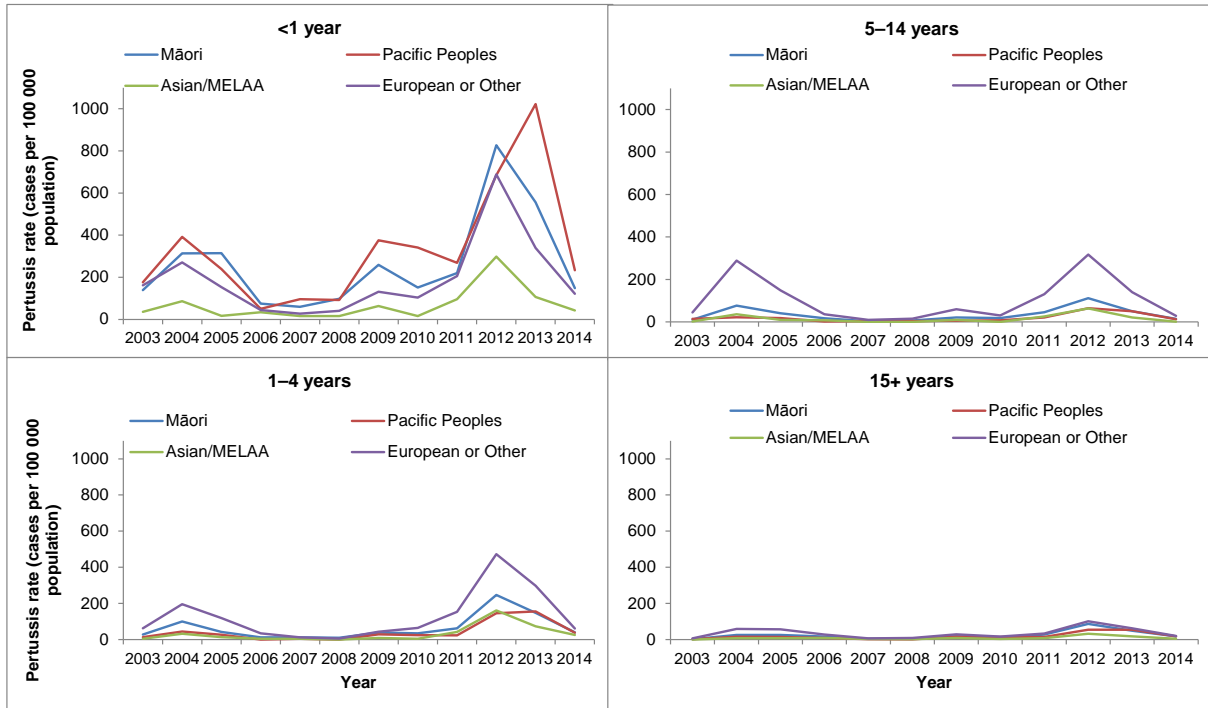
Note: Includes confirmed, probable and suspect cases only.

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



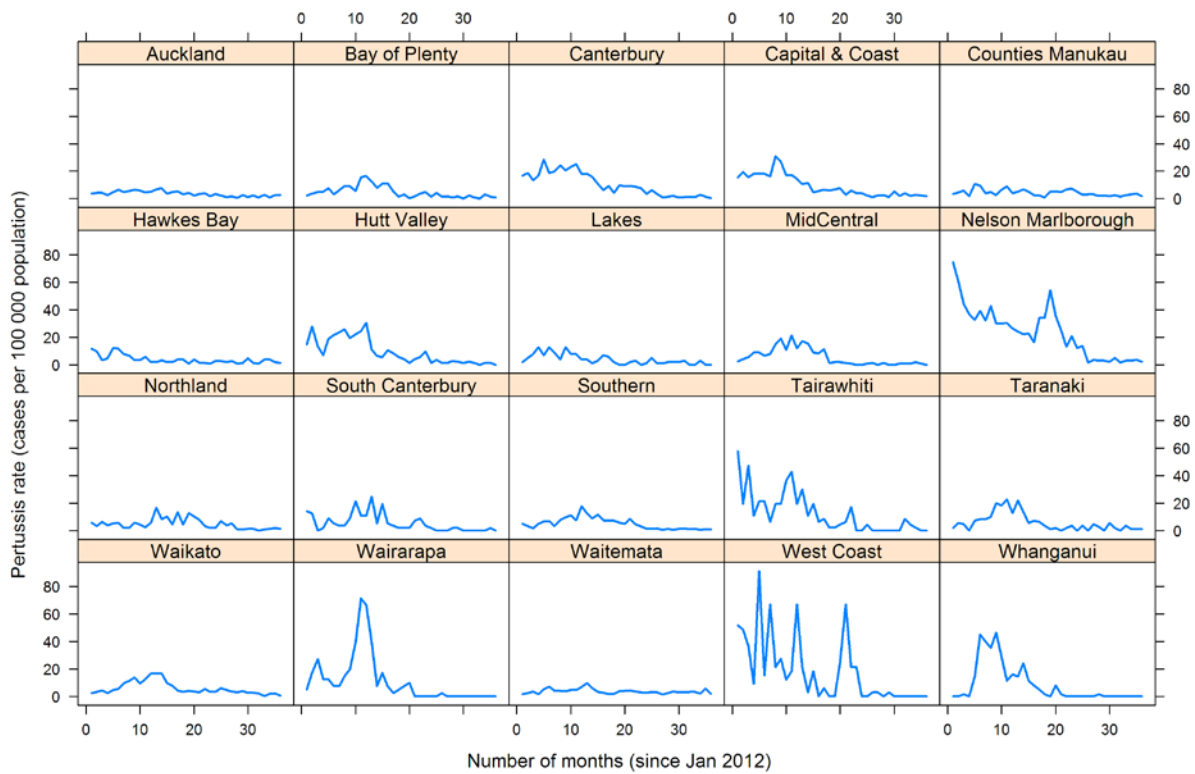
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

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



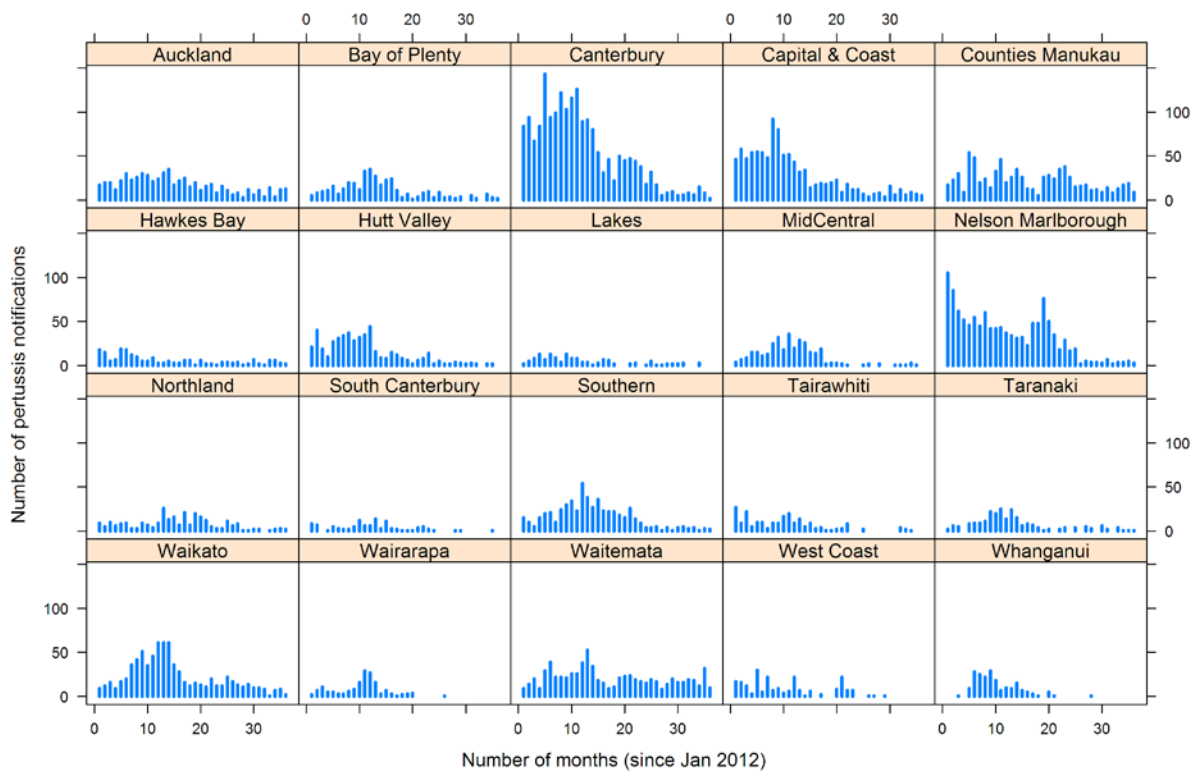
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

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 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>