PERTUSSIS REPORT

Oct–Dec 2013

Data contained within this quarterly report is based on information recorded on EpiSurv by public health service staff as at 13 January 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 fourth quarter of 2013 (October to December), 614 cases of pertussis were notified, including 273 confirmed, 285 probable, 15 suspect, and 41 cases still under investigation. The number of cases reported in the fourth quarter has decreased compared to the previous quarter (Jul–Sep) (822 cases). Fifty (8.1%) of the notified cases were aged less than 1 year. Fifty-seven cases were hospitalised and no deaths were reported.

In the fourth quarter of 2013, the highest number of cases (excluding cases under investigation) were reported by Canterbury (100 cases), Counties Manukau (99 cases), and Nelson Marlborough (64 cases) DHBs. The overall quarterly rate was 12.9 per 100 000 population (573 cases). The DHB with the highest rate was Nelson Marlborough (45.5 per 100 000, 64 cases), followed by West Coast (42.6 per 100 000, 14 cases), and Canterbury (20.0 per 100 000, 100 cases) DHBs.

In December, 159 cases of pertussis were notified, including 66 confirmed, 66 probable, 2 suspect, and 25 cases still under investigation. The number of cases reported in December has decreased compared to the previous month (211 cases). Fifteen (9.4%) of the notified cases were aged less than 1 year. Sixteen cases were hospitalised and no deaths were reported.

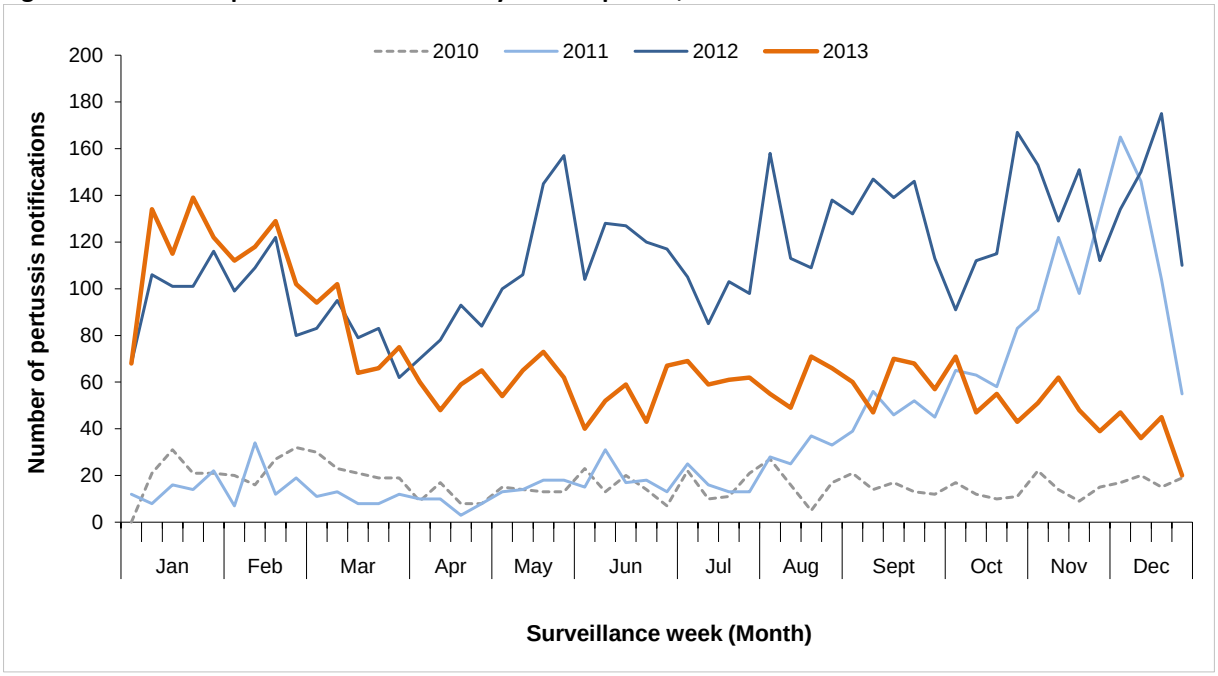
In December, highest number of cases (excluding cases still under investigation) was reported by Counties Manukau DHB (26 cases), followed by Canterbury (18 cases), and Nelson Marlborough (17 cases) DHBs. The DHB with the highest monthly rate was Nelson Marlborough (12.1 per 100 000, 17 cases), followed by Counties Manukau (5.1 per 100 000, 26 cases), and Canterbury (3.6 per 100 000, 18 cases) DHBs.

This report summarises pertussis notifications for 2013 (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.

Temporal distribution of pertussis notifications

Figure 1 shows total pertussis notifications by week for 2010–2013 (to week ending 27 December). In 2013, notifications since the second quarter have fallen below those seen in 2012; however they still remain above 2010 levels. 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. Two deaths were reported in 2013. Figure 5 (Appendix) shows pertussis notifications for confirmed, suspect and probable cases only by week for 2010–2013. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition.

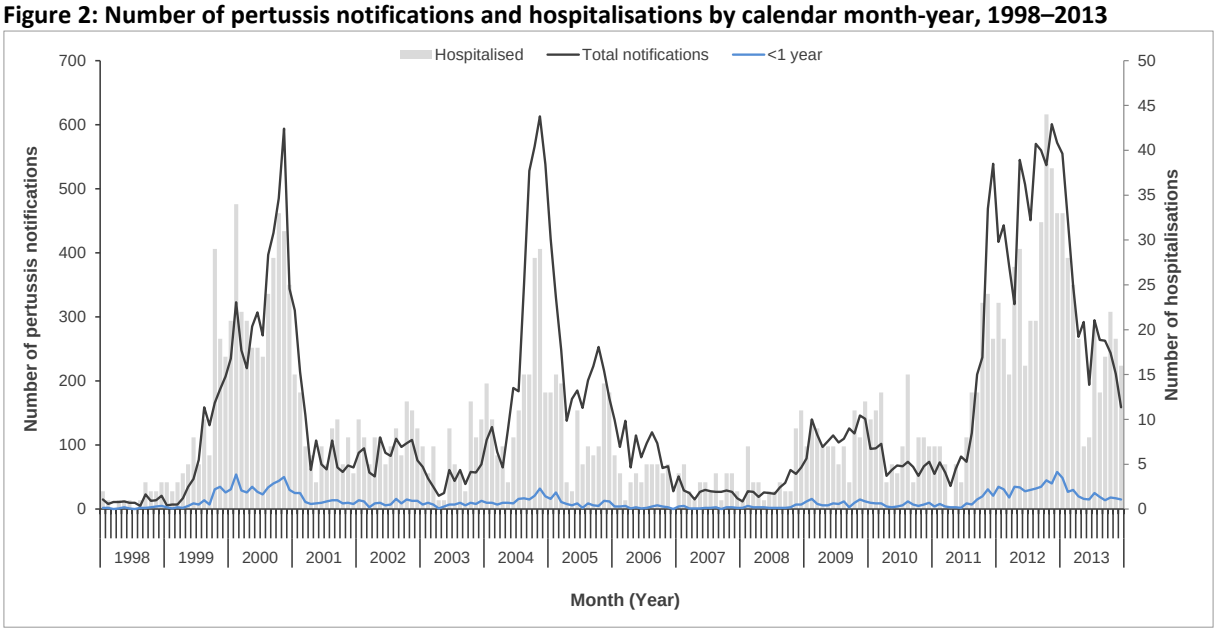
Figure 1: Number of pertussis notifications by week reported, 2010–2013



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 1 January 1998 and 31 December 2013. 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. However, notifications had been rising again since 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, 1998–2013



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 December. Pertussis rates varied across age groups. Of the notifications in the fourth quarter of 2013, infants aged less than one year had the highest rate (75.9 per 100 000 population, 46 cases), followed by the 1–4 years (27.1 per 100 000 population, 68 cases) age group.

Of the 573 notifications in the fourth quarter, 10 (1.7%) were infants under 6 weeks of age. Figure 3 shows the cumulative notification rate of pertussis cases by age group and ethnicity in 2013.

Table 1: Number of pertussis notifications and rate (cases per 100 000 population) by age group, Oct–Dec 2013

	Oct–Dec 2013			December 2013	
Age group (Years)	**All cases[1]**	**Rate[2]**	**Hospitalisations**	**New cases[1]**	**Hospitalisations**
<1	46	75.9	31	12	8
1–4	68	27.1	4	16	2
5–9	53	18.2	3	11	1
10–14	53	18.3	1	6	0
15–19	18	5.8	0	1	0
20–29	53	8.4	2	17	1
30–39	64	11.5	2	18	0
40–49	90	14.4	5	17	2
50–59	62	10.9	2	21	0
60–69	35	8.2	3	8	1
70+	31	7.4	2	7	0
Overall	573	12.9	55	134	15

[1] Includes confirmed, probable and suspect cases only.
[2] Rate of pertussis cases per 100 000 population calculated using 2012 mid-year population estimates.

Ethnicity

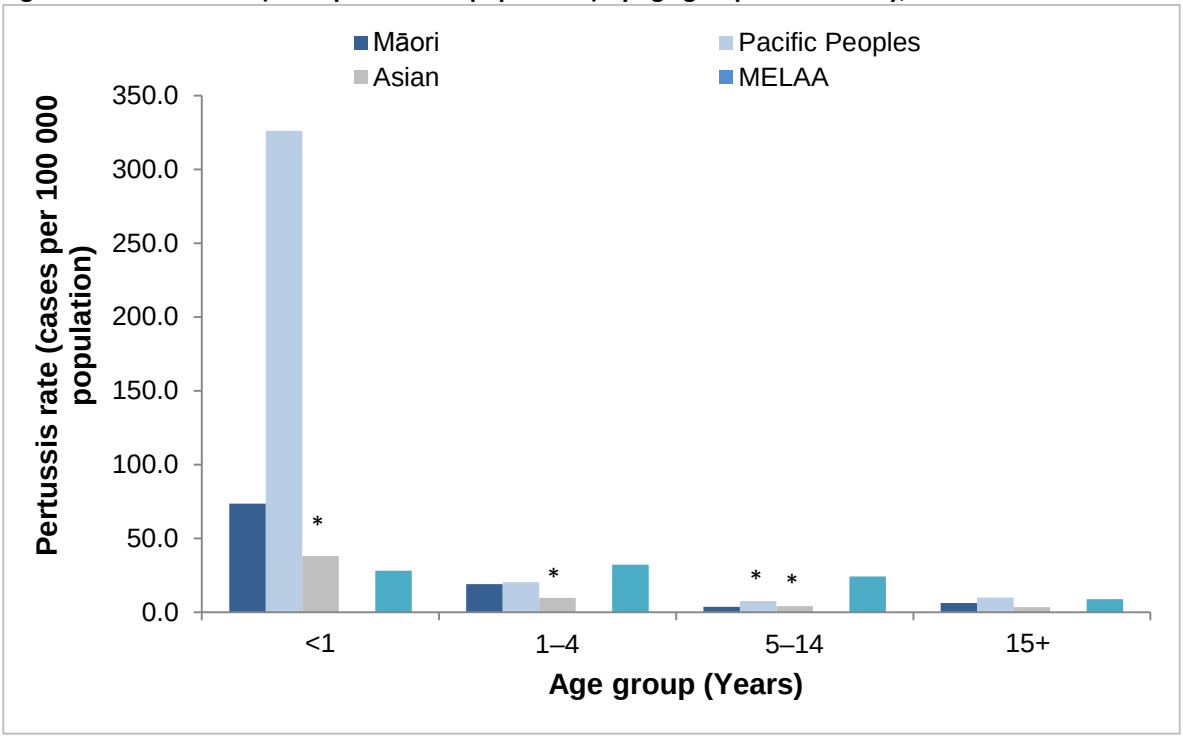
Pertussis notifications and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European or Other group had the highest numbers reported in December 2013 (74 cases). Of the cases in the fourth quarter of 2013, the ethnic-specific cumulative rates were highest for Pacific Peoples (17.6 per 100 000, 47 cases), followed by the European or Other ethnic group (11.7 per 100 000, 359 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), Oct–Dec 2013

	Oct–Dec 2013[1]						December 2013		
Ethnicity	All cases	(Rate[2])	Hosp[3]	(%[4])	<1 year[5]	(Rate[2])	New cases	Hosp[3]	<1 year[5]
Māori	56	(8.6)	12	(21.4)	12	(73.5)	15	3	5
Pacific Peoples	47	(17.6)	19	(40.4)	20	(326.1)	16	6	5
Asian	17	(4.2)	5	(29.4)	2	-	4	1	0
MELAA	0	-	0	-	0	-	0	0	0
European or Other	359	(11.7)	15	(4.2)	9	(28.1)	74	3	1
Unknown	94	-	4	-	3	-	25	2	1
Overall	573	(12.9)	55	(9.6)	46	(71.0)	134	15	12

[1] Cumulative notifications for Oct–Dec 2013, includes confirmed, probable and suspect cases only.
[2] Rate of pertussis cases per 100 000 population. Denominator data used to determine rates are based on the proportion of people in each ethnic group from the estimated resident 2006 census population applied to the 2012 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, Oct–Dec 2013



Note: Cumulative notifications for Oct–Dec 2013, includes confirmed, probable and suspect cases only. Denominator data used to determine rates are based on the proportion of people in each ethnic group from the estimated resident 2006 census population applied to the 2012 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

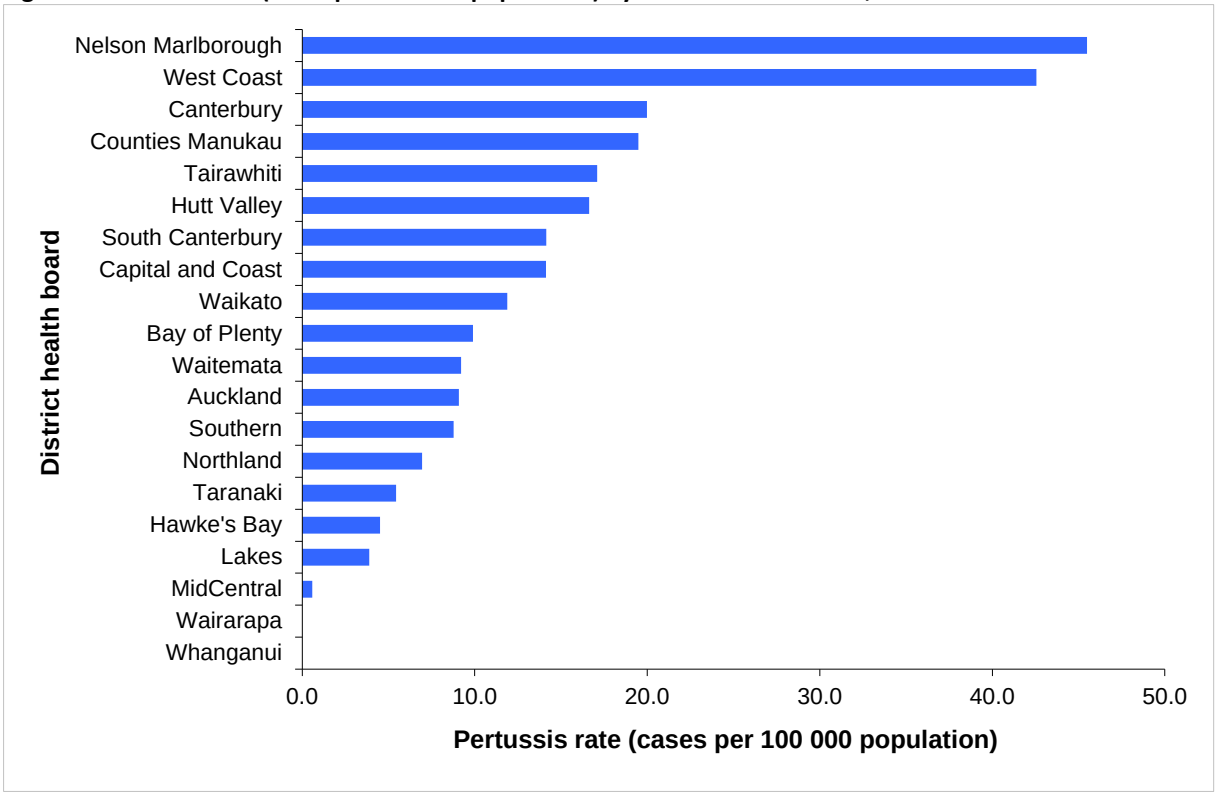
The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5, respectively. In December, 15 hospitalisations were recorded. There have been 55 hospitalisations recorded in EpiSurv during the fourth quarter of 2013. Thirty-one (56.4%) of these were infants aged less than one year including nine cases aged less than six weeks. Of the 426 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (57.6%, 19/33), Asian (33.3%, 5/15), Māori (22.6%, 12/53), and European or Other (4.6%, 15/325). No hospitalisations were reported for the MELAA ethnic group. No deaths were reported in the fourth quarter of 2013.

Geographic distribution

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

In December, the high number of cases was reported in Counties Manukau DHB (26 cases), followed by Canterbury (18 cases), and Nelson Marlborough (17 cases) DHBs. Highest rate in the fourth quarter of 2013 was recorded in Nelson Marlborough DHB (45.5 per 100 000, 64 cases), followed by West Coast (42.6 per 100 000, 14 cases), and Canterbury (20.0 per 100 000, 100 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, Oct–Dec 2013



Note: Cumulative notifications for Oct–Dec 2013, includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using 2012 mid-year population estimates.

Immunisation status of confirmed notifications

The immunisation status for confirmed pertussis cases is shown in Tables 3 and 4 for December and the fourth quarter of 2013, respectively. Of the 66 confirmed cases reported in December, 33 (50.0%) had a known vaccination status. Of these 8 were not vaccinated. Six cases had received one dose of vaccine, 11 cases had received three doses, four cases had received four doses, and one case was recorded as having completed pertussis vaccination (five doses). A further three cases reported being vaccinated but no dose information was available.

Table 3: Immunisation status of confirmed pertussis notifications, December 2013

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	3	2							1
3–4mths	3	2							1
5mths–3yrs	8			8					
4–10yrs	12	2		2	4		1	2	1
11+ yrs	39			1		1	2	5	30
Total	66	6	0	11	4	1	3	8	33

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 273 confirmed cases reported during the fourth quarter of 2013, 152 (55.7%) had a known vaccination status (Table 4). Of these 152 cases, 70 were not vaccinated, including nine cases aged less than 6 weeks and thus not eligible for vaccination. Fifteen cases had received one dose of vaccine, three cases had received two doses, 28 cases had received three doses, 12 cases had received four doses, and six cases reported having completed pertussis vaccination (five doses). A further 18 cases reported being vaccinated but no dose information was recorded.

Table 4: Immunisation status of confirmed pertussis notifications, Oct–Dec 2013

Age group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated (no dose info)	Not vaccinated	Unknown
<6wks[1]	9	0						9	
6wks–2mths	14	5	1				1	5	2
3–4mths	7	3	2					1	1
5mths–3yrs	38	1		23				13	1
4–10yrs	42	3		4	11		4	12	8
11+ yrs	163	3		1	1	6	13	30	109
Total	273	15	3	28	12	6	18	70	121

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.

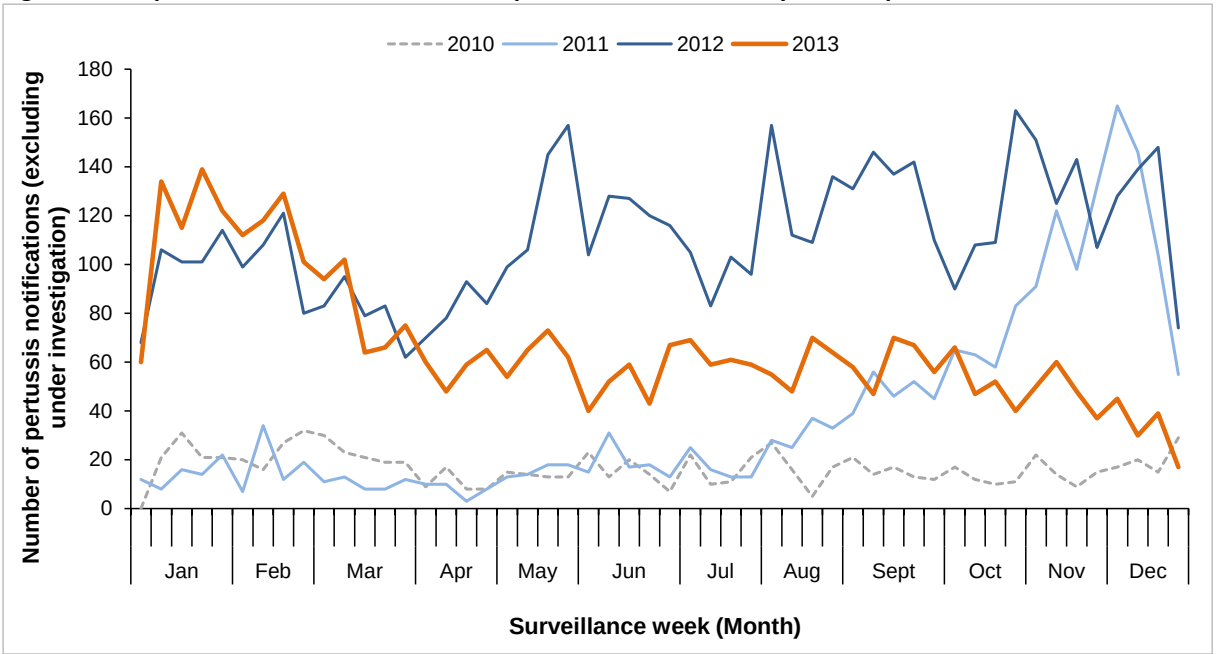
Appendix

Table 5: Number of pertussis notifications and rate (cases per 100 000 population) by district health board, Oct–Dec 2013

	Oct–Dec 2013[1]				December 2013		
District health board	All cases	Rate[2]	Hosp[3]	<1 year[4]	New cases	Hosp[3]	<1 year[4]
Northland	11	6.9	2	1	3	0	0
Waitemata	51	9.2	6	2	15	2	0
Auckland	42	9.1	6	4	16	3	1
Counties Manukau	99	19.5	28	21	26	7	6
Waikato	44	11.9	3	1	12	0	0
Lakes	4	-	0	0	1	0	0
Bay of Plenty	21	9.9	1	2	3	0	0
Tairawhiti	8	17.1	0	0	0	0	0
Taranaki	6	5.4	0	0	0	0	0
Hawke's Bay	7	4.5	0	1	4	0	1
Whanganui	0	-	0	0	0	0	0
MidCentral	1	-	0	0	0	0	0
Hutt Valley	24	16.6	2	3	2	0	0
Capital and Coast	42	14.1	2	8	12	0	3
Wairarapa	0	-	0	0	0	0	0
Nelson Marlborough	64	45.5	1	1	17	1	0
West Coast	14	42.6	1	0	0	0	0
Canterbury	100	20.0	2	2	18	1	1
South Canterbury	8	14.1	0	0	1	0	0
Southern	27	8.8	1	0	4	1	0
Total	573	12.9	55	46	134	15	12

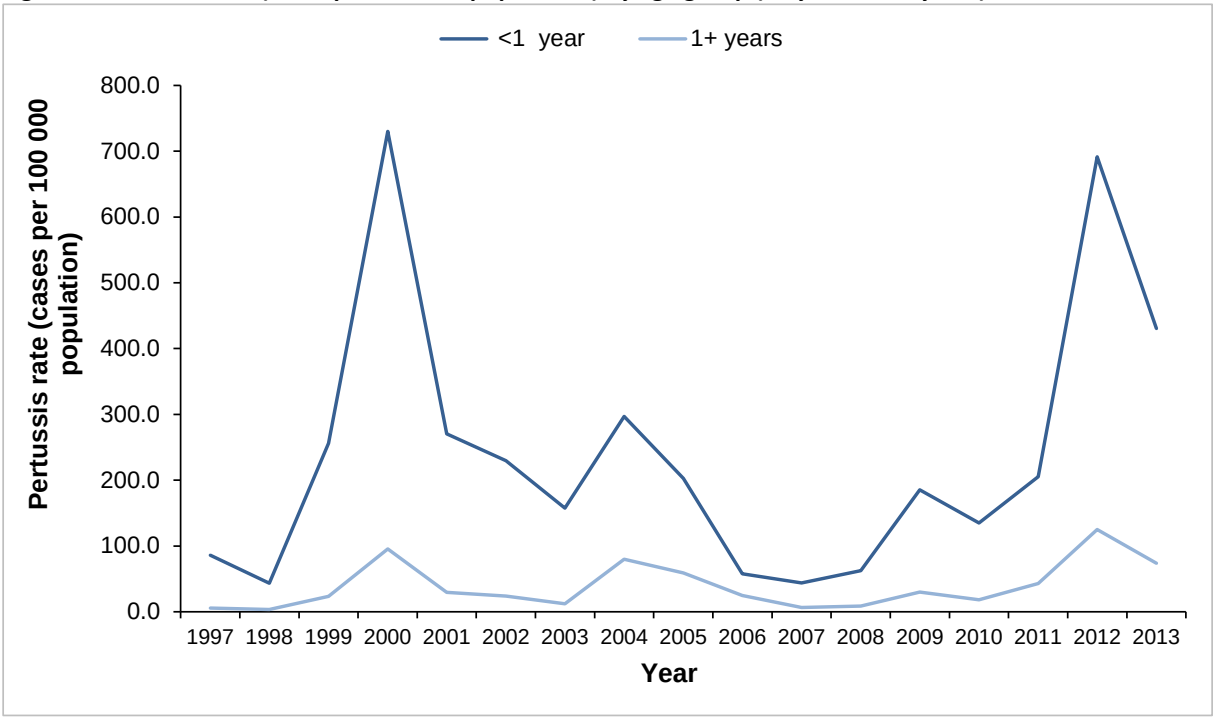
[1] Cumulative notifications for Oct–Dec 2013, includes confirmed, probable and suspect cases only.
[2] Rate of pertussis cases per 100 000 population calculated using 2012 mid-year population estimates, rates have not been calculated where fewer than five cases were notified.
[3] Number of hospitalised notifications.
[4] Number of cases in the <1 year age group.

Figure 5: Comparative trend of the number of pertussis notifications by week reported, 2010–2013



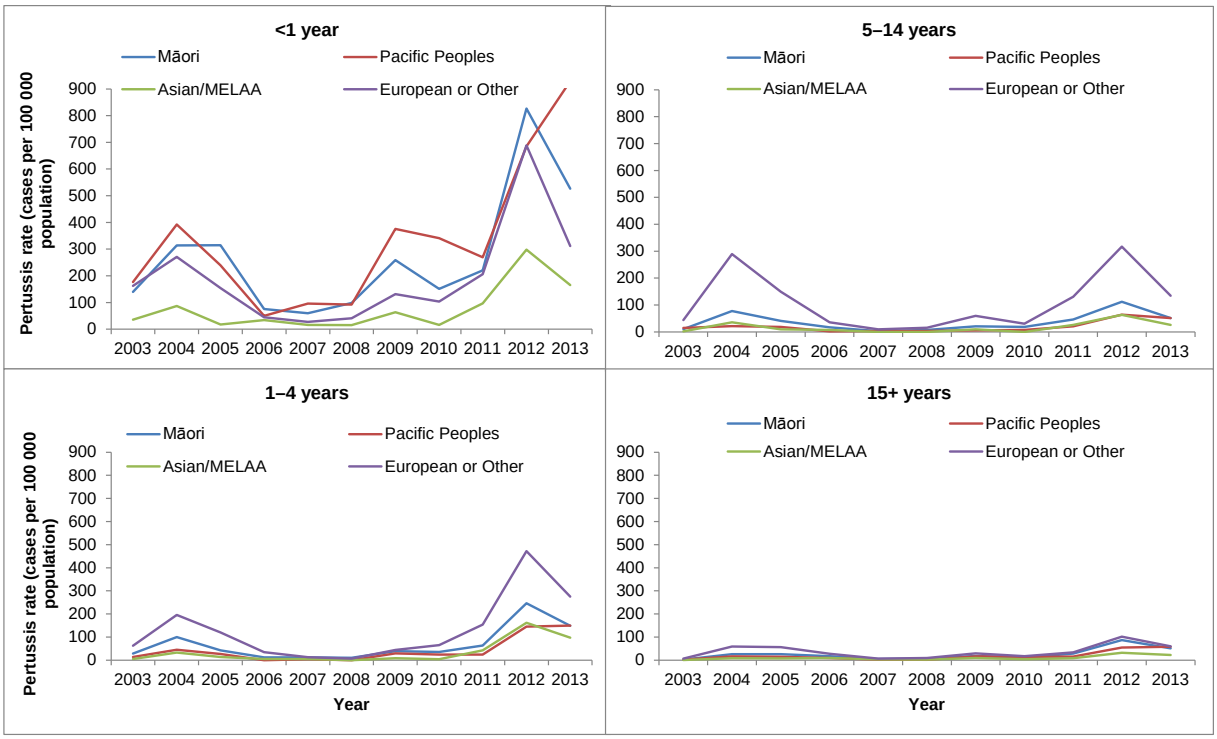
Note: Includes confirmed, probable and suspect cases only.

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



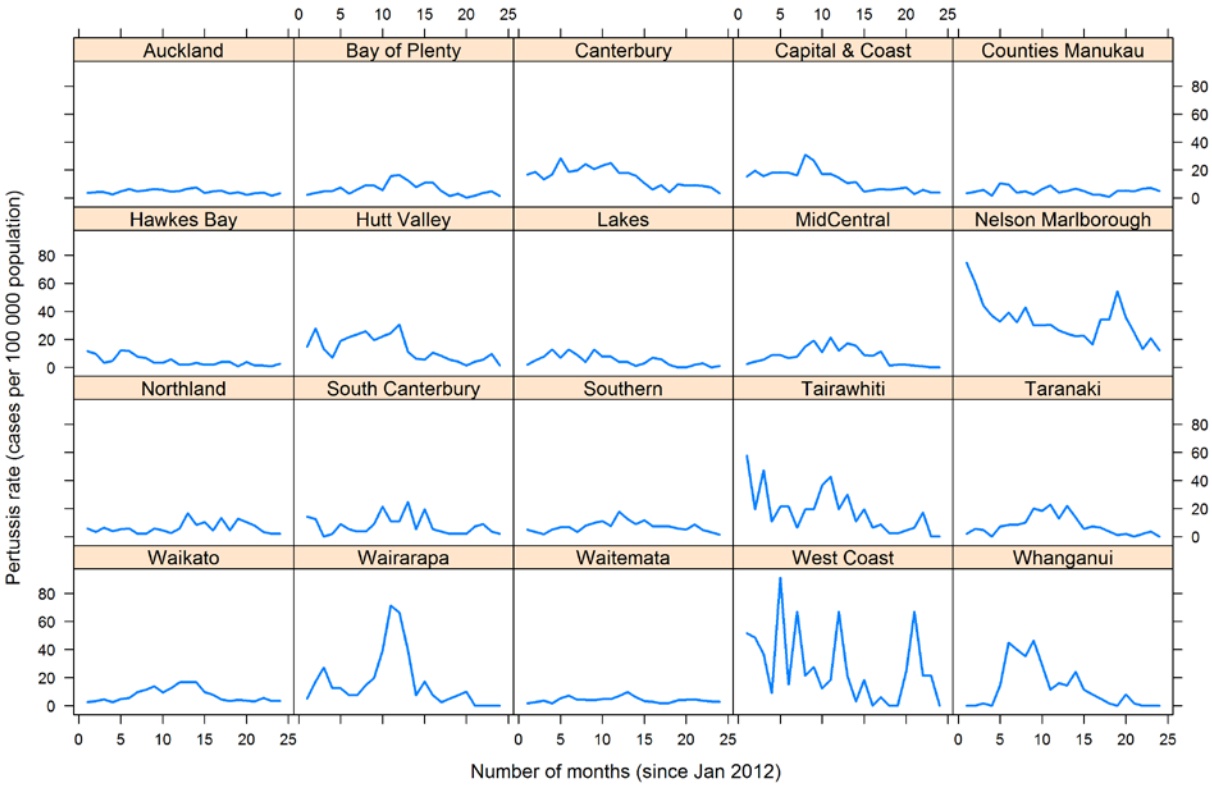
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

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



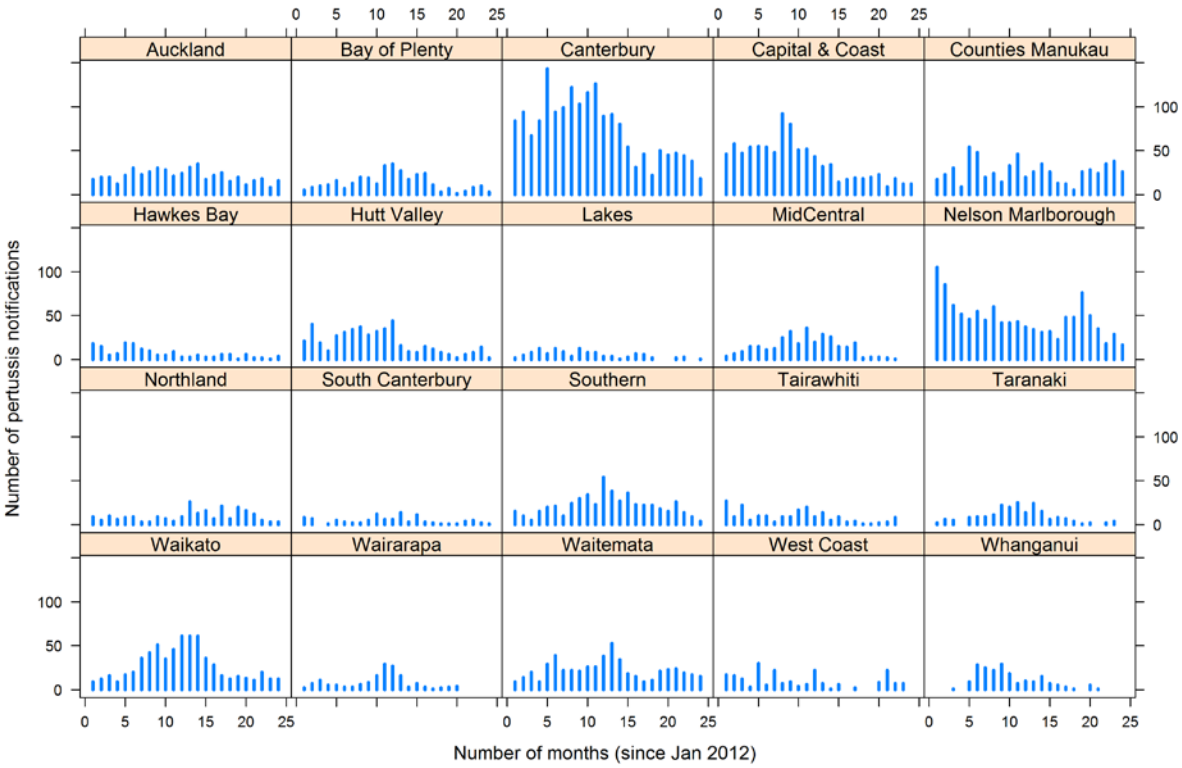
Note: Includes confirmed, probable and suspect cases only. Rate of pertussis cases per 100 000 population calculated using mid-year population estimates.

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