

PERTUSSIS REPORT

This report includes cases of pertussis reported in EpiSurv up to midnight 17 August 2012. Data were extracted from EpiSurv at 10.00 am 21 August 2012.

Summary

In the past two surveillance weeks (4 August – 17 August 2012), 295 new cases of pertussis (173 and 122 cases, respectively) were notified, including 81 confirmed cases, 129 probable cases, 14 suspect cases, and 71 cases still under investigation. These numbers have increased compared to the numbers reported over the previous two weeks (210 cases). Twenty (6.8%) of the notified cases were aged less than 1 year. Thirteen cases were hospitalised and one death was reported.

There has been a total of 3435 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 504 over the same period in 2011), including 1272 confirmed cases, 1876 probable cases, 132 suspect cases, and 155 cases still under investigation. 239 (7.0%) of the notified cases were in the less than 1 year age group. During this period, 165 hospitalisations and one death have been reported.

In the last two weeks, the highest number of cases (excluding cases under investigation) was reported in Canterbury (51 cases), Capital and Coast (47 cases), and Hutt Valley (19 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (323.8 per 100 000, 453 cases), followed by West Coast (318.6 per 100 000, 105 cases) and Tairāwhiti (173.8 per 100 000, 81 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (725 cases), followed by Nelson Marlborough (453 cases), Capital and Coast (415), Counties Manukau (208) and Hutt Valley (201) DHBs. Monthly pertussis rates and cases (excluding cases under investigation) by DHB can be seen in Figures 8 and 9 (appendix).

This report summarises pertussis notifications for 2012 (first surveillance week starts on 31 December 2011) and new cases in the last two weeks, and 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 in the appendix. 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 cases

Figure 1 shows weekly total pertussis notifications for 2010, 2011 and 2012 (to week ending 17 August). Notifications for the past two weeks of 2012 remain well above 2011 and 2010 levels, although in 2011 they have been running above 2010 levels since week 34 (ending 26 August 2011) and have been increasing more or less consistently. There was an increasing trend in notifications through April and May 2012, followed by a general decrease since the beginning of June. However, weekly notifications had the highest spike (during week 32) this year and since 2010. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition. One death has been reported since the beginning of this year. Figure 5 (appendix) shows weekly pertussis notifications for confirmed, suspect and probable cases only for 2010, 2011 and 2012.

Figure 1: Number of pertussis notifications by week reported 2010 - 2012

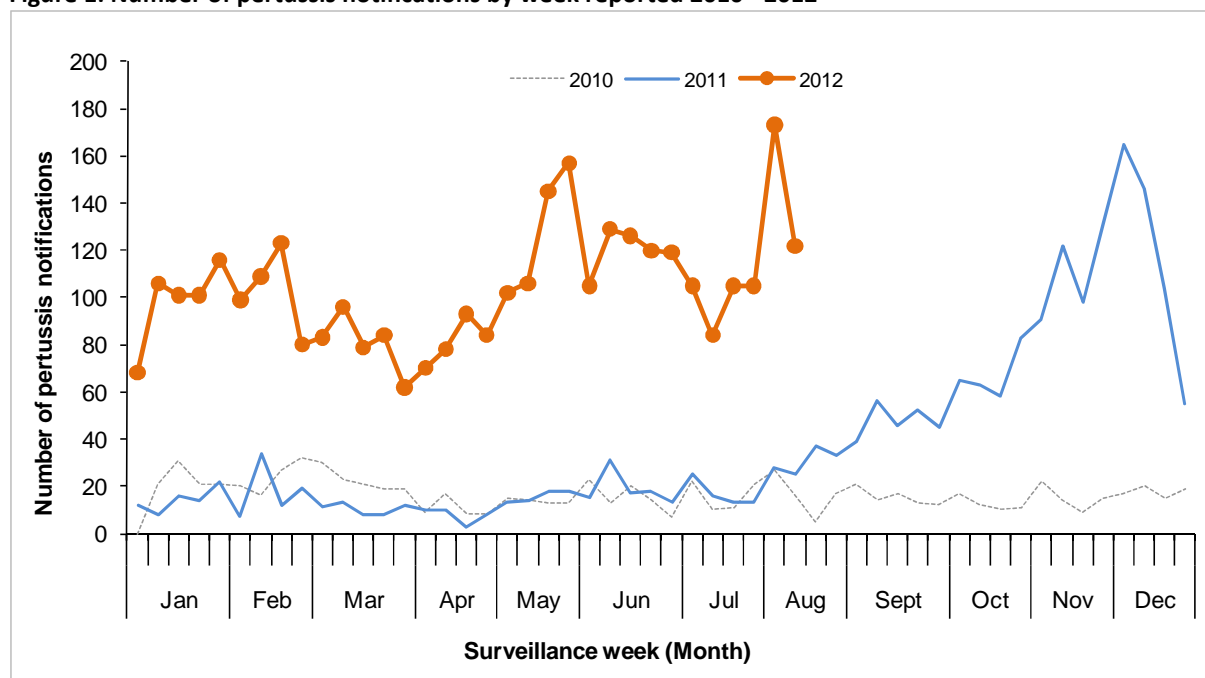
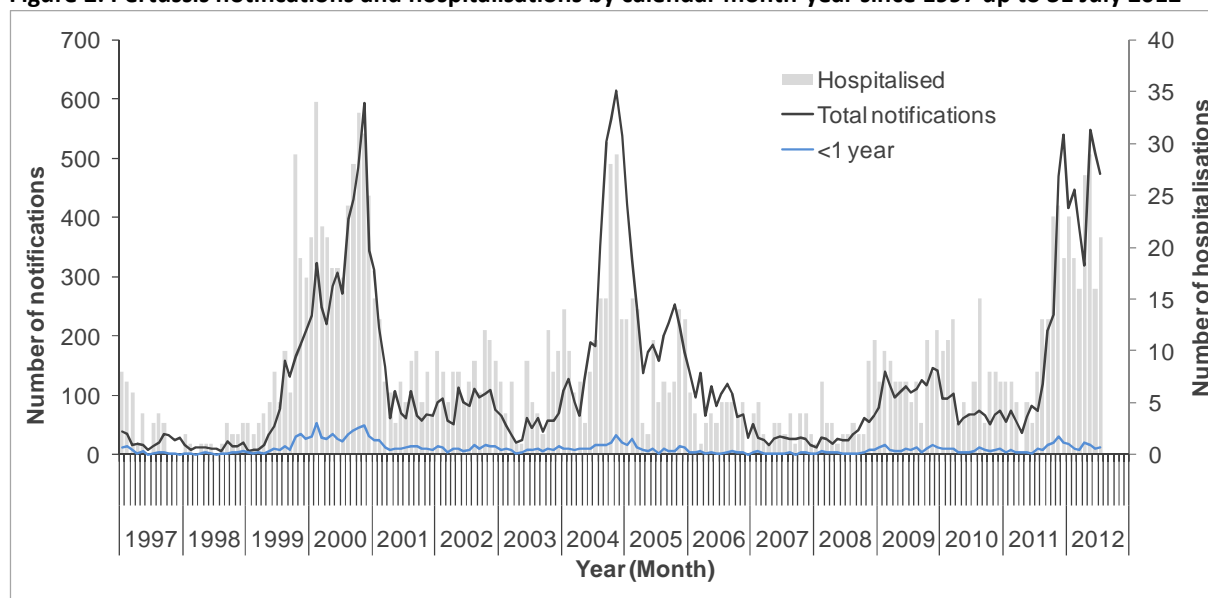


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 July 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, notifications have been rising again since May 2011. 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 over 1997-2011.

Figure 2: Pertussis notifications and hospitalisations by calendar month-year since 1997 up to 31 July 2012

In the following sections all analyses exclude cases still under investigation. Therefore, “cases” refer to those classified as confirmed, probable, or suspect.

Age distribution of cases

Table 1 shows notifications and associated rates by age, including new cases for the last two weeks. Pertussis rates varied across age groups. Of the cases reported in 2012, infants aged less than one year had the highest cumulative incidence (362.4 per 100 000 population, 226 cases), followed by the 1 to 4 years (220.3 per 100 000, 555 cases), and 5 to 9 years (143.1 per 100 000, 411 cases) age groups.

Of the 3280 cumulative cases with known age, 26 (0.8%) were infants under 6 weeks of age. Figure 3 shows the cumulative incidence of pertussis cases by age group and ethnicity in 2012.

Table 1: Pertussis cases and rates by age group in 2012, and new cases in the last two weeks

Age group (Years)	Cumulative ² notifications			Last two weeks ³	
	All cases ¹	Rates ¹	Hosp	New Cases	Hosp
<1	226	362.4	96	13	4
1 to 4	555	220.3	11	43	1
5 to 9	411	143.1	6	32	0
10 to 14	291	99.3	2	25	0
15 to 19	162	51.1	4	7	0
20 to 29	291	47.0	3	20	1
30 to 39	388	68.9	7	19	0
40 to 49	397	62.9	7	27	0
50 to 59	251	45.1	12	11	0
60 to 69	183	43.9	6	16	1
70+	125	30.7	4	11	1
Unknown	0		0	0	0
Overall	3280	74.5	158	224	8

¹Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

²Cumulative notifications (excluding cases under investigation) since 31 December 2011

³Notifications between 4 August and 17 August 2012 inclusive

Hosp: hospitalisation counts

Ethnicity

Pertussis cases and rates by ethnicity are shown in Table 2. Of the pertussis cases with known ethnicity, the European ethnic group had the highest numbers reported in the last two weeks (162 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (92.8 per 100 000, 2500 cases), followed by Māori (75.0 per 100 000, 424 cases) and Pacific Peoples (53.0 per 100 000, 120 cases). Figure 3 shows the European ethnic group having the highest rates across all age groups except the under 1 year age group. The ethnic distribution of cases in the under 1 year age group is also shown below. The Pacific Peoples ethnic group had the highest rates in this age group, followed by Māori.

Table 2: Pertussis cases and rates by ethnicity (prioritised) in 2012, and new cases in the last two weeks

Ethnicity	Cumulative ² notifications					Last two weeks ³		
	All cases (Rate ¹)		<1 year (Rate ¹)		Hosp (% ⁴)	New Cases	<1 year	Hosp
Māori	424	(75.0)	65	(463.3)	50 (11.8)	26	6	3
Pacific Peoples	120	(53.0)	26	(507.7)	28 (23.3)	7	0	0
Other	124	(33.1)	8	(152.3)	6 (4.8)	11	1	1
European	2500	(92.8)	125	(420.8)	74 (3.0)	162	5	4
Unknown	112		2		0	18	1	0
Overall	3168	(78.7)	224	(399.1)	158 (5.0)	224	13	8

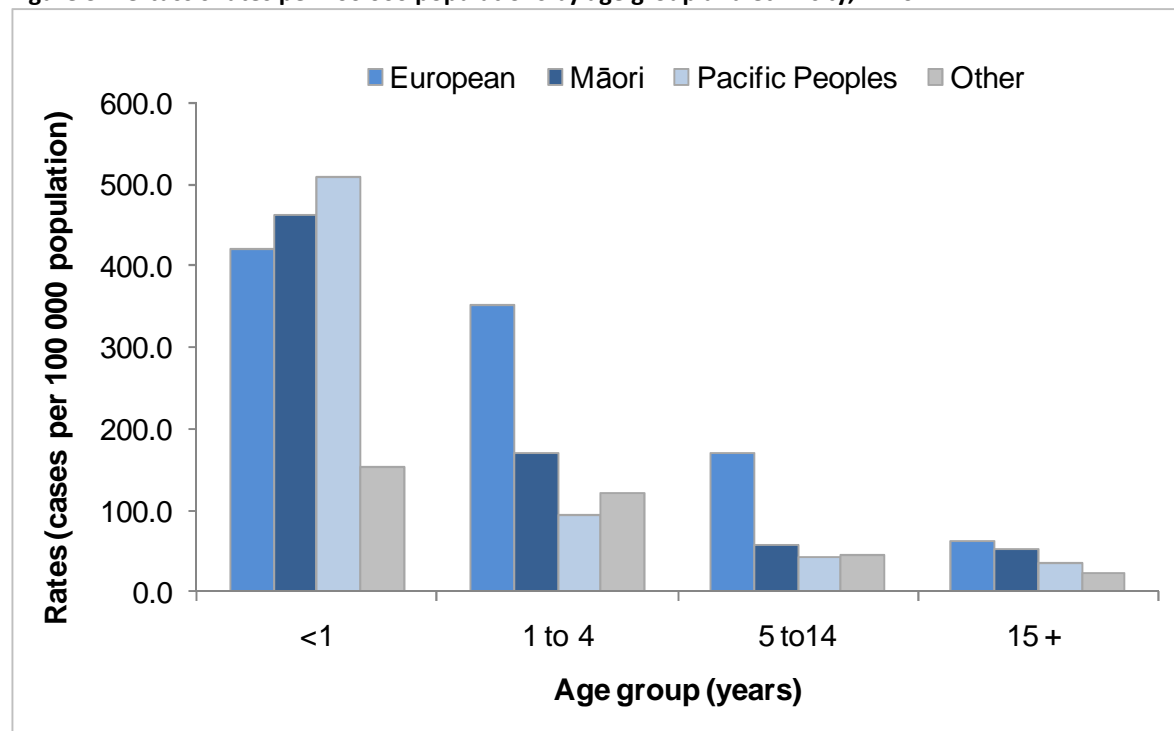
¹Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

²Cumulative notifications (excluding cases under investigation) since 31 December 2011

³Notifications between 4 August and 17 August 2012 inclusive

⁴Percentage of hospitalised notifications by ethnic group

Figure 3: Pertussis rates per 100 000 populations by age group and ethnicity, in 2012



Note: Rate of pertussis cases per 100 000 population calculated using Census 2006 usually resident populations.

Figure 7 (appendix) shows the trend of cumulative pertussis notification rates (per 100 000 population) by age group and ethnicity for years 2003 to 2011. 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 highest in the European ethnic group. Note that these rates are for all notifications.

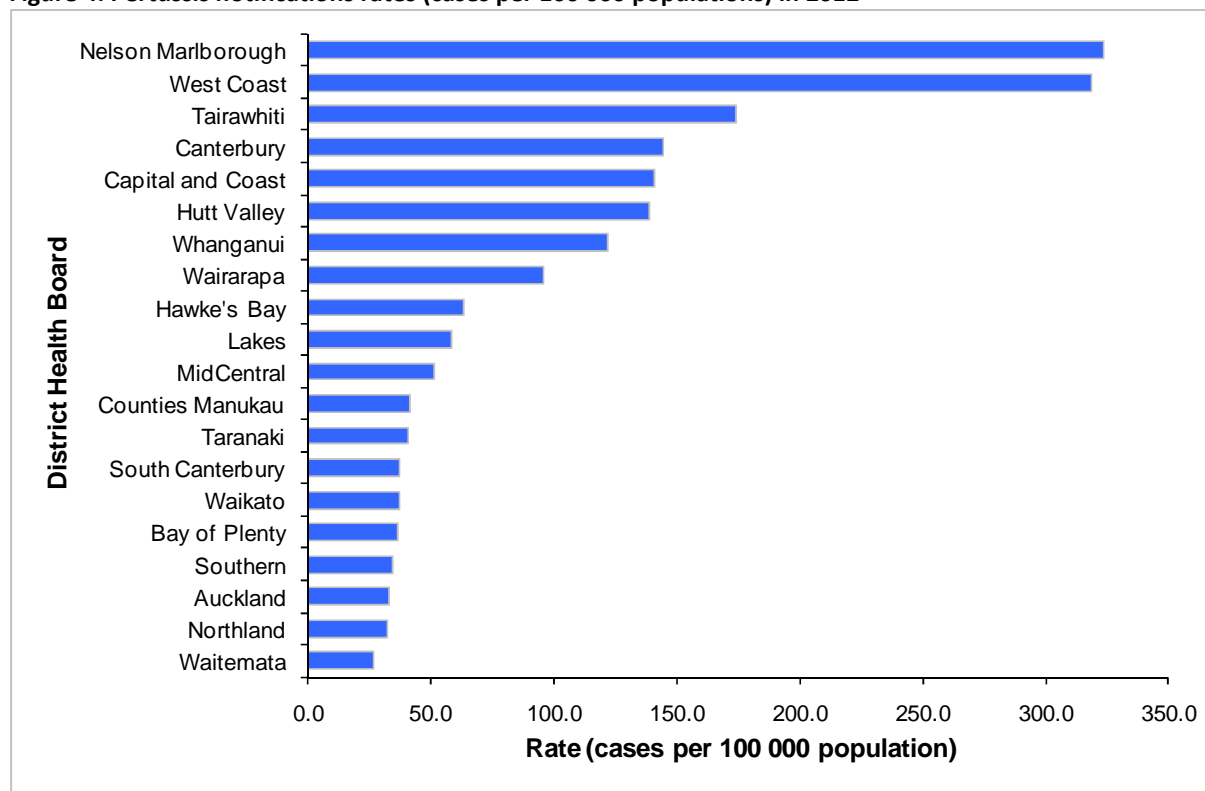
Hospitalisations

The distribution of hospitalisations by age group, ethnicity, and DHB is described in Table 1, Table 2 and Table 5, respectively. In the last two weeks, eight hospitalisations were recorded. There have been 158 hospitalisations reported in EpiSurv in 2012. Ninety-six (60.8%) of these were infants aged less than one year including 25 cases aged less than six weeks. Of the 2879 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (25.0%, 28/112), Māori (13.0%, 50/386), Other (5.0%, 6/110), and European (3.3%, 74/2271).

Geographic distribution

The rates of pertussis notifications by DHB can be seen in Figure 4 and Table 5 (appendix). In the last two weeks, the highest number of cases was reported in Canterbury (51 cases), Capital and Coast (47 cases) and Hutt Valley (19 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (323.8 per 100 000, 453 cases), followed by West Coast (318.6 per 100 000, 105 cases) and Tairāwhiti (173.8 per 100 000, 81 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (725 cases), followed by Nelson Marlborough (453 cases), Capital and Coast (415), Counties Manukau (208) and Hutt Valley (201) DHBs. Cases in the under 1 year age group by DHB are shown in Table 5 (appendix). Also, monthly pertussis rates and cases (excluding cases under investigation) by DHB can be seen in Figures 8 and 9 (appendix).

Figure 4: Pertussis notifications rates (cases per 100 000 populations) in 2012



Note: Rates were calculated using 2011 mid-year population estimates.

Immunisation status

The immunisation status for confirmed pertussis cases with known age is shown in Table 3 and Table 4 for the last two weeks and for 2012, respectively. Of the 81 confirmed cases reported in the last two weeks, 54 (66.7%) had a known vaccination status. Of these 54 cases, 19 were not vaccinated. Five cases had received one dose of vaccine, two cases had received two doses, six cases had received three doses, eight cases had received four doses, and seven cases reported having completed pertussis vaccination. A further seven cases reported being vaccinated but no dose information was available.

Table 3: Immunisation status of pertussis cases (confirmed) notified in the last two weeks (ending 17 August)

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		
							(no dose info)	Not vaccinated	Unknown
<6wks	0	0	0	0	0	0	0	0	0
6wks - 2mths	5	3	0	0	0	0	0	2	0
3-4 mths	1	1	0	0	0	0	0	0	0
5mths - 3yrs	22	0	2	5	2	0	0	10	3
4 - 10yrs	23	1	0	1	6	6	3	3	3
11+ yrs	30	0	0	0	0	1	4	4	21
Unknown	0	0	0	0	0	0	0	0	0
Total	81	5	2	6	8	7	7	19	27

Note: Immunisation status has been extracted from Episurv notifications. Health professionals use a range of sources to update immunisation status including the NIR, parental recall or Well Child book records.

Of the 1272 confirmed cases with known age reported during 2012, 846 (66.5%) had a known vaccination status (Table 4). Of these 846 cases, 278 were not vaccinated, including 12 cases aged less than 6 weeks and thus not eligible for vaccination. Seventy-five cases had received one dose of vaccine, 19 cases had received two doses, 119 cases had received three doses, 121 cases had received four doses, and 75 cases reported having completed pertussis vaccination. A further 159 cases reported being vaccinated but no dose information was available.

Table 4: Immunisation status of pertussis cases (confirmed) notified in 2012 (since 31 December 2011)

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		
							(no dose info)	Not vaccinated	Unknown
<6wks	14	0	0	0	0	0	0	12	2
6wks - 2mths	42	24	1	0	0	0	0	13	4
3-4 mths	22	5	8	0	0	0	0	8	1
5mths - 3yrs	227	3	7	92	29	1	13	59	23
4 - 10yrs	311	7	1	17	77	48	41	87	33
11+ yrs	656	36	2	10	15	26	105	99	363
Unknown	0	0	0	0	0	0	0	0	0
Total	1272	75	19	119	121	75	159	278	426

Note: Immunisation status has been extracted from Episurv notifications. Health professionals use a range of sources to update immunisation status including the NIR, parental recall or Well Child book records.

Appendix

Table 5: Pertussis cases and rates by DHB in 2012, and new cases in the last two weeks

DHB	Cumulative ² notifications				Last two weeks ³		
	All cases	Rates ¹	<1 year*	Hosp	New Cases	<1 year*	Hosp
Northland	51	32.2	5	3	1	0	0
Waitemata	145	26.6	14	15	4	0	0
Auckland	150	32.9	11	13	6	0	0
Counties Manukau	208	41.6	33	33	8	2	2
Waikato	136	37.0	8	8	16	0	0
Lakes	60	58.3	10	6	3	2	2
Bay of Plenty	77	36.3	4	3	8	1	1
Tairāwhiti	81	173.8	9	1	0	0	0
Taranaki	45	41.0	3	4	6	2	0
Hawke's Bay	99	63.5	8	5	5	0	0
Whanganui	77	122.1	10	9	8	1	0
MidCentral	86	51.1	7	6	6	0	0
Hutt Valley	201	139.1	9	3	19	1	0
Capital and Coast	415	140.8	20	4	47	1	0
Wairarapa	39	96.1	3	7	4	0	1
Nelson Marlborough	453	323.8	24	4	14	0	0
West Coast	105	318.6	3	1	7	1	0
Canterbury	725	144.2	29	20	51	0	1
South Canterbury	21	37.2	0	2	0	0	0
Southern	106	34.6	16	11	11	2	1
Total	3280	74.5	226	158	224	13	8

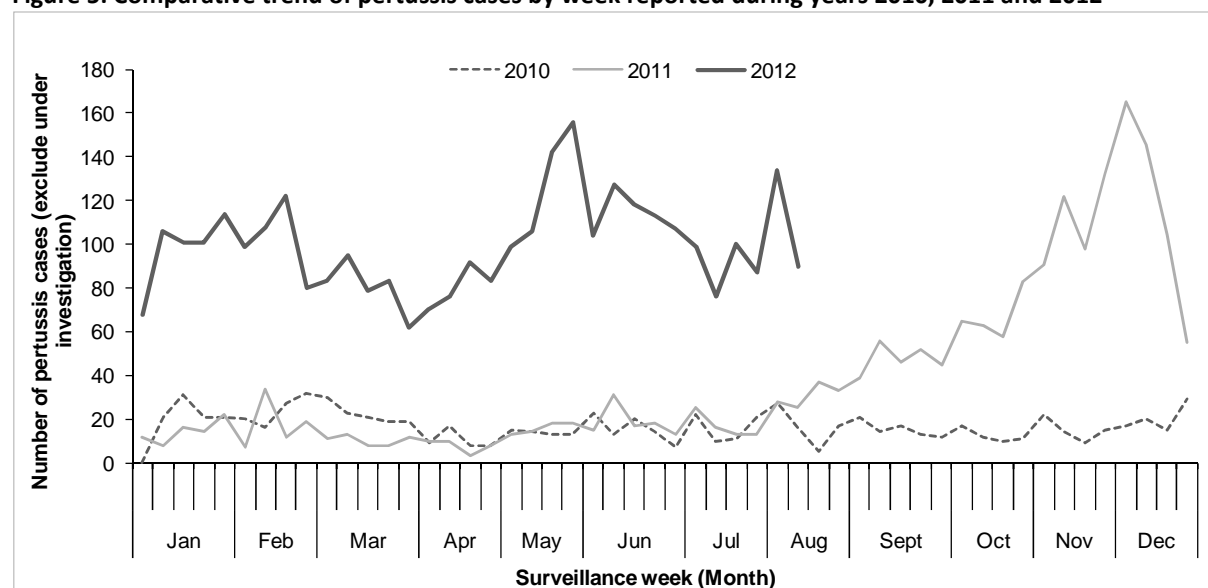
¹Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

²Cumulative notifications (excluding cases under investigation) since 31 December 2011

³Notifications between 4 August and 17 August 2012 inclusive

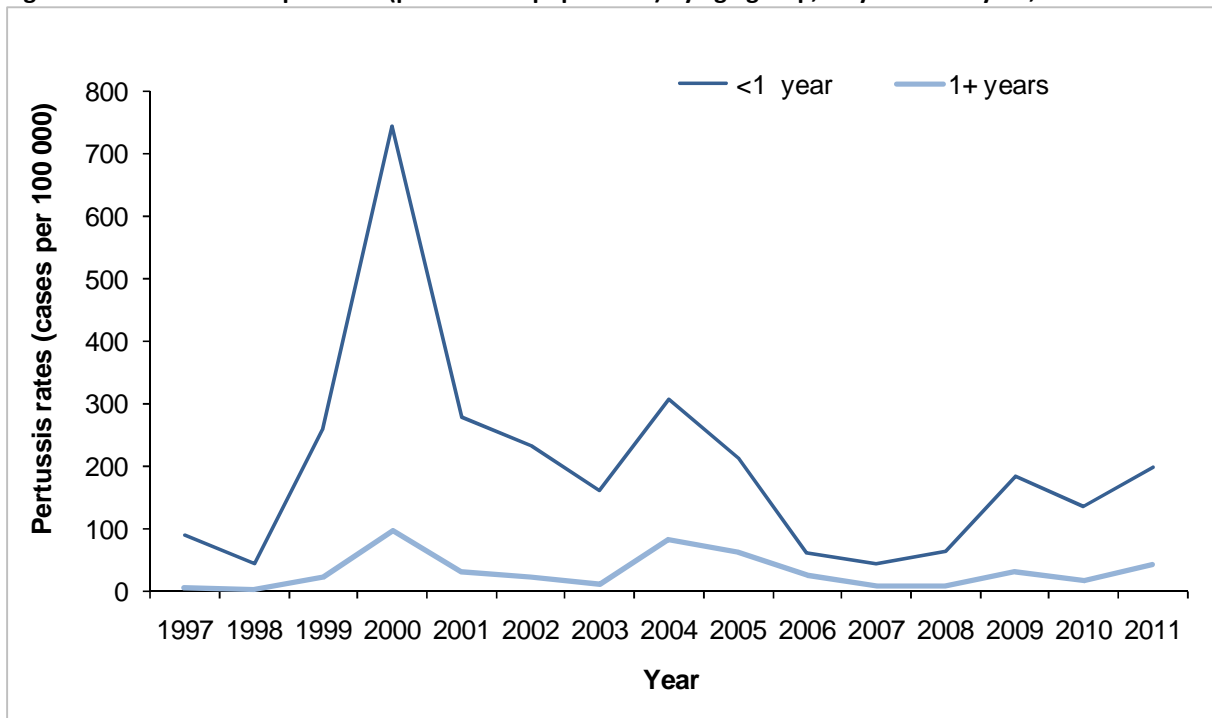
*Cases in the less than 1 year age group

Figure 5: Comparative trend of pertussis cases by week reported during years 2010, 2011 and 2012



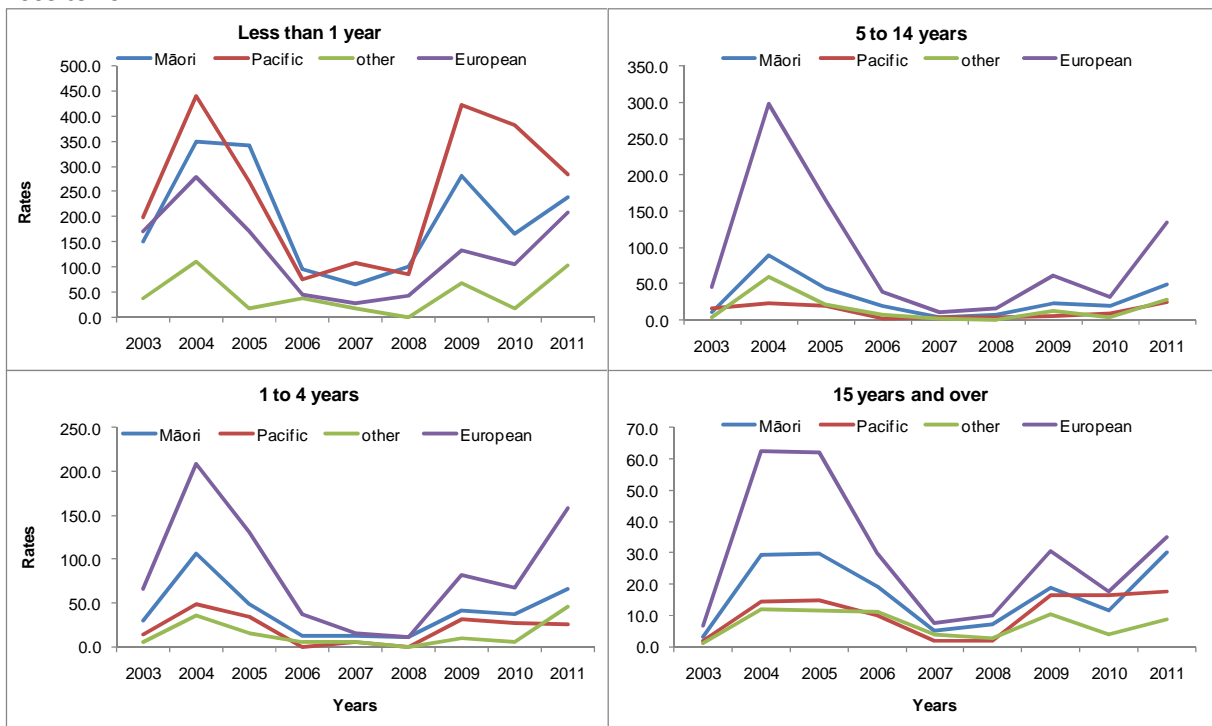
Note: Includes confirmed, probable and suspect cases only.

Figure 6: Annual rates of pertussis (per 100 000 population) by age group, <1 year vs. 1+ year, 1997-2011



Note: Rate of pertussis notified cases per 100 000 population calculated using mid-year population estimates.

Figure 7: Trends in cumulative pertussis rates (per 100 000 population) by age group and ethnicity, 2003 to 2011



Note: Rate of pertussis notified cases per 100 000 population (includes cases under investigation) calculated using mid-year population estimates

Figure 8: Monthly pertussis rates (cases per 100 000 population) by DHB, since January 2011

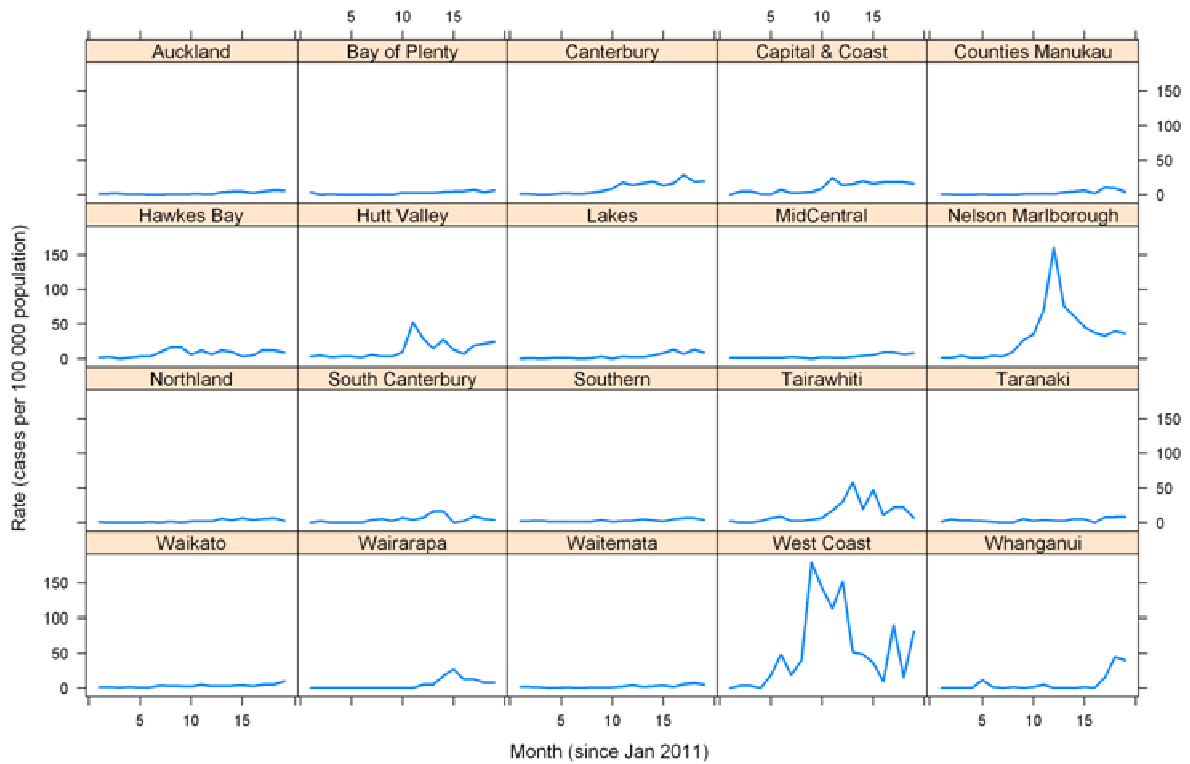
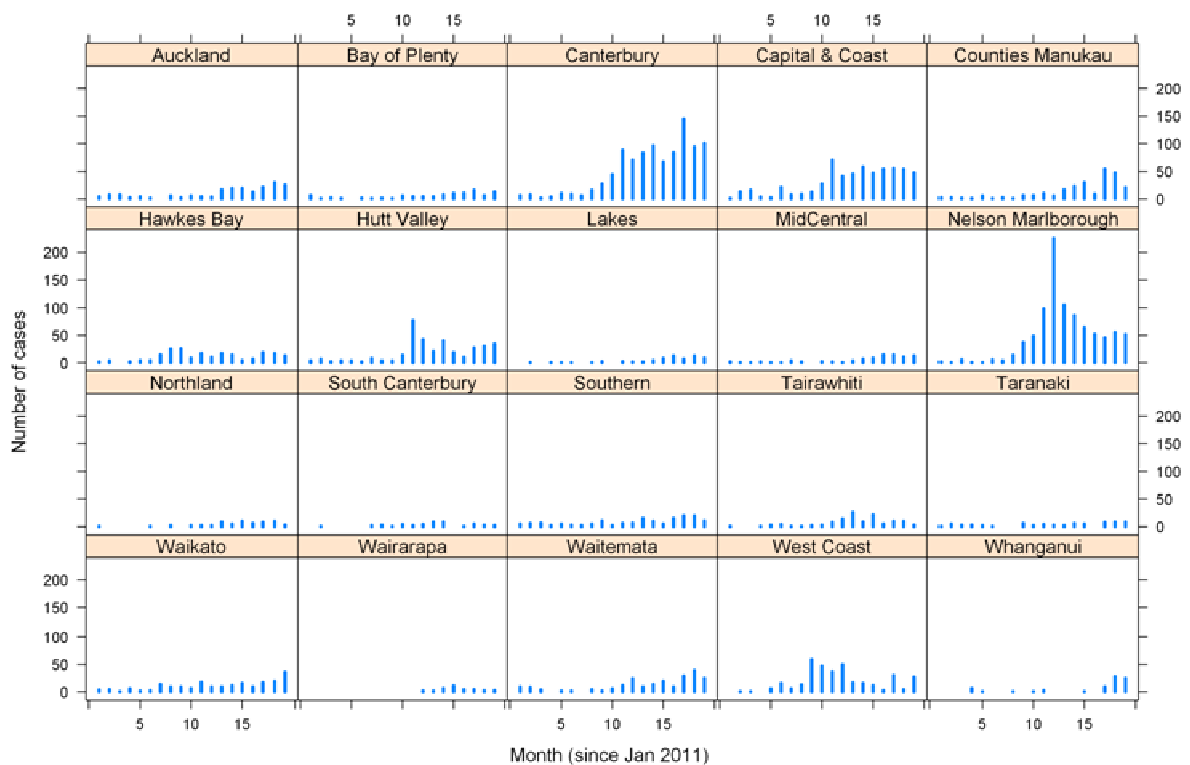


Figure 9: Monthly pertussis cases by DHB, since January 2011



Note: cases include confirmed, probable, and suspect only.

Case classification for pertussis notification in New Zealand to 31 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 will be available at: <http://www.surv.esr.cri.nz/surveillance/PertussisRpt.php>.