

PERTUSSIS REPORT

This report includes cases of pertussis reported in EpiSurv up to midnight 9 November 2012. Data were extracted from EpiSurv at 10.00 am 13 November 2012.

Summary

In the past two surveillance weeks (27 October – 9 November 2012), 336 new cases of pertussis (178 and 158 cases, respectively) were notified, including 159 confirmed cases, 103 probable cases, 16 suspect cases, and 58 cases still under investigation. The numbers have increased compared to the numbers reported over the previous two weeks (229 cases). Twenty-four (7.1%) of the notified cases were aged less than 1 year. Eighteen cases were hospitalised.

There has been a total of 4979 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 1081 over the same period in 2011), including 2009 confirmed cases, 2565 probable cases, 254 suspect cases, and 151 cases still under investigation. 337 (6.8%) of the notified cases were in the less than 1 year age group. During this period, 251 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 (75 cases), Capital and Coast (29 cases), and Waikato (21 cases) DHBs. The highest cumulative rate to date in 2012 was recorded in Nelson Marlborough (411.0 per 100 000, 575 cases), followed by West Coast (388.3 per 100 000, 128 cases) and Tairāwhiti (251.1 per 100 000, 117 cases) DHBs. During this same period the highest number of notifications was reported from Canterbury DHB (1056 cases), followed by Capital and Coast (602) and Nelson Marlborough (575), Hutt Valley (285) and Counties Manukau (275) 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 9 November). 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 has been a general increase in notifications since the beginning of October 2012. Weekly notifications had the highest spike (during week 44) this year, surpassing week 32 this year and week 49 in 2011. 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

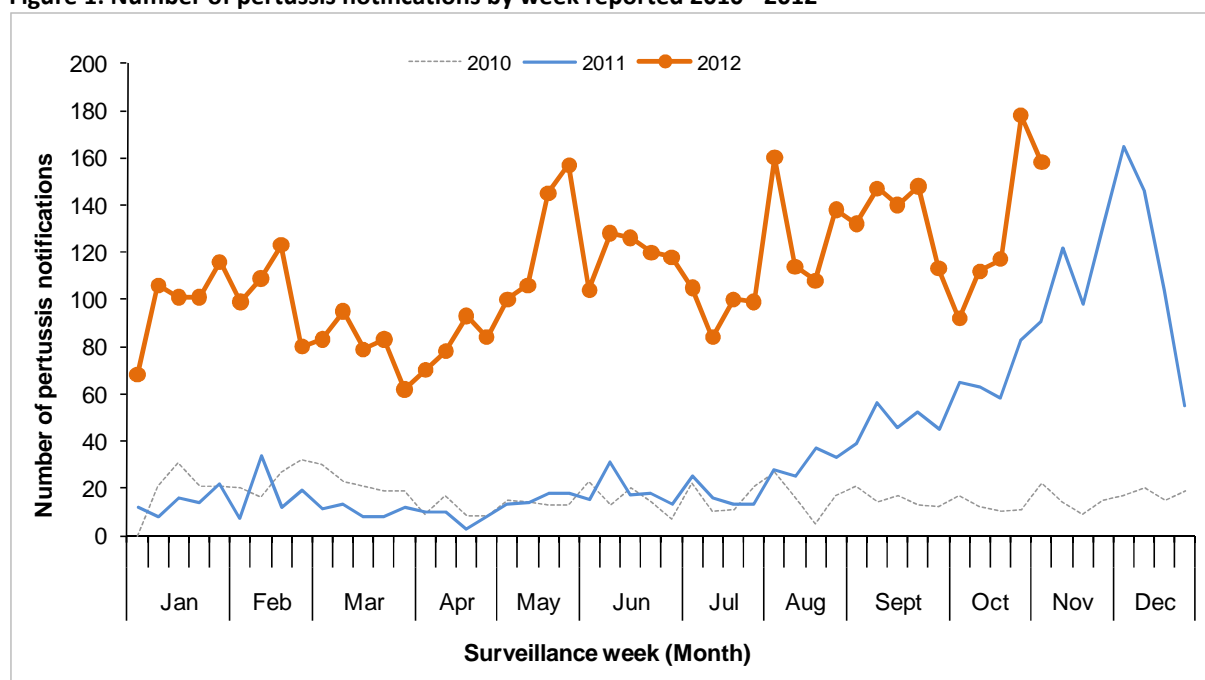
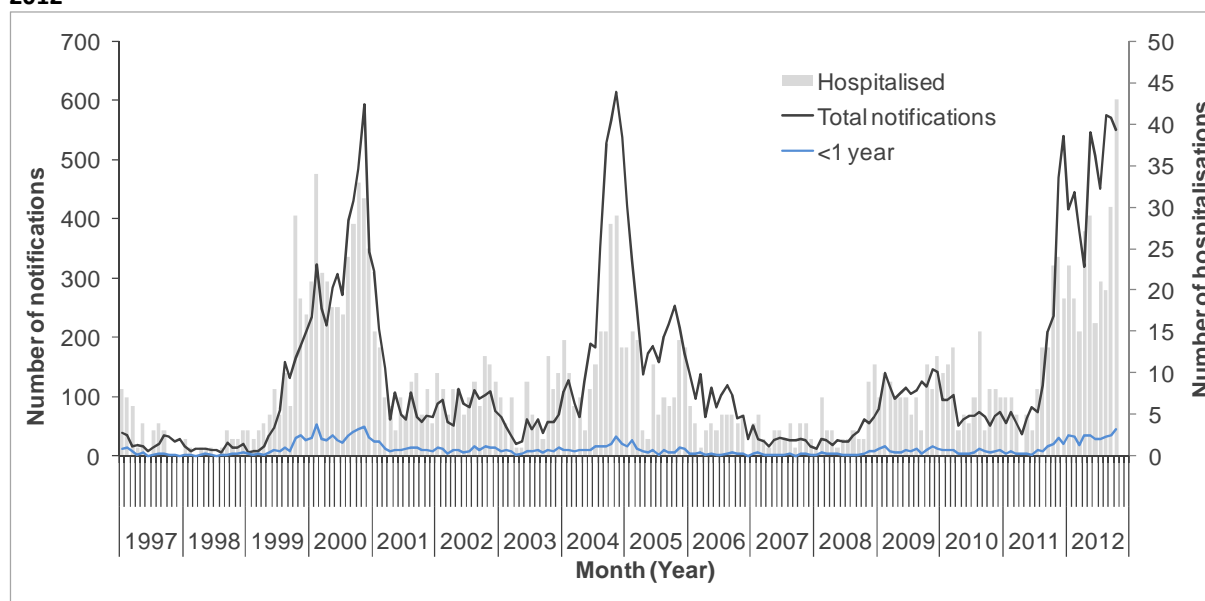


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 October 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, 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 October 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 (521.1 per 100 000 population, 325 cases), followed by the 1 to 4 years (308.5 per 100 000, 777 cases), and 5 to 9 years (216.9 per 100 000, 623 cases) age groups.

Of the 4828 cumulative cases with known age, 38 (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	325	521.1	140	17	4
1 to 4	777	308.5	23	40	2
5 to 9	623	216.9	9	43	0
10 to 14	450	153.6	5	32	2
15 to 19	235	74.1	5	8	0
20 to 29	430	69.5	4	27	0
30 to 39	548	97.4	9	29	1
40 to 49	618	97.8	12	39	1
50 to 59	375	67.5	13	23	1
60 to 69	278	66.6	11	13	0
70+	169	41.5	12	7	1
Unknown	0		0	0	0
Overall	4828	109.6	243	278	12

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 27 October and 9 November 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 (199 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (133.9 per 100 000, 3608 cases), followed by Māori (115.0 per 100 000, 650 cases) and Pacific Peoples (74.7 per 100 000, 169 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. Māori had the highest rates in this age group, followed by Pacific Peoples.

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	650 (115.0)	103 (734.1)	80 (12.3)	45	6	5		
Pacific Peoples	169 (74.7)	34 (663.9)	37 (21.9)	3	0	0		
Other	171 (45.6)	13 (247.5)	11 (6.4)	6	0	1		
European	3608 (133.9)	165 (555.5)	112 (3.1)	199	10	6		
Unknown	230	10	3	25	1	0		
Overall	4828 (119.9)	325 (573.9)	243 (5.0)	278	17	12		

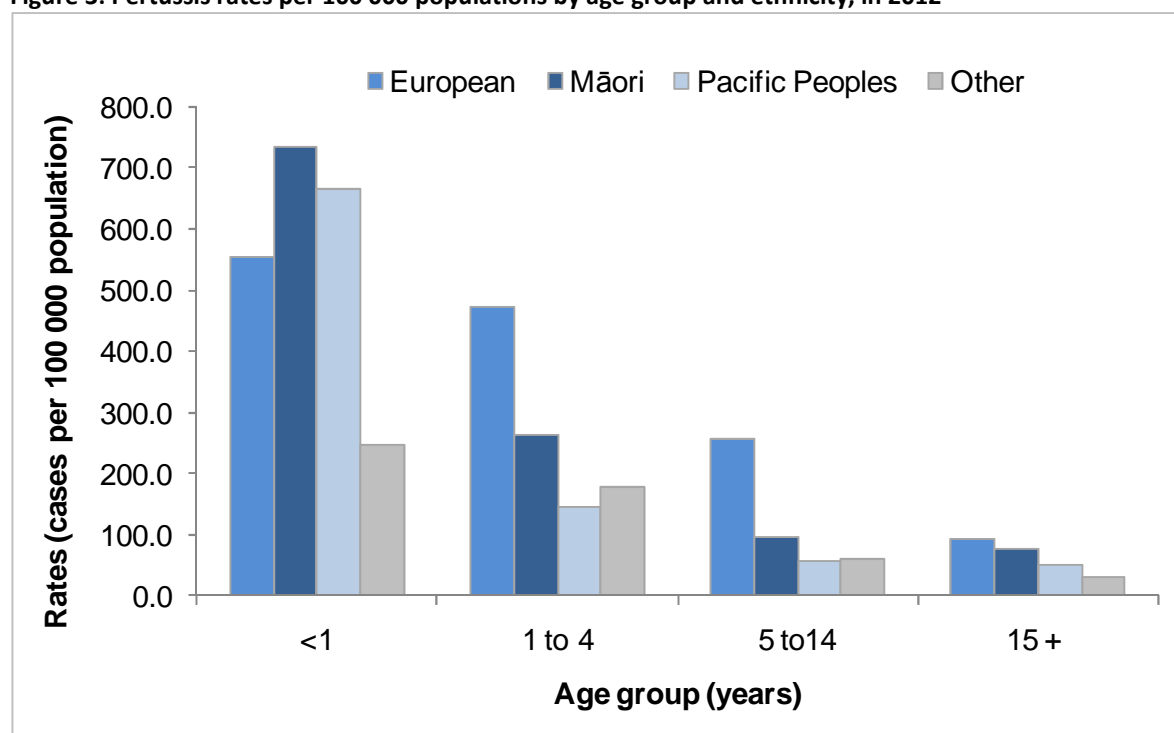
¹Value in brackets denotes rate of pertussis cases per 100 000 population calculated using usually resident populations (Census 2006).

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

³Notifications between 27 October and 9 November 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.

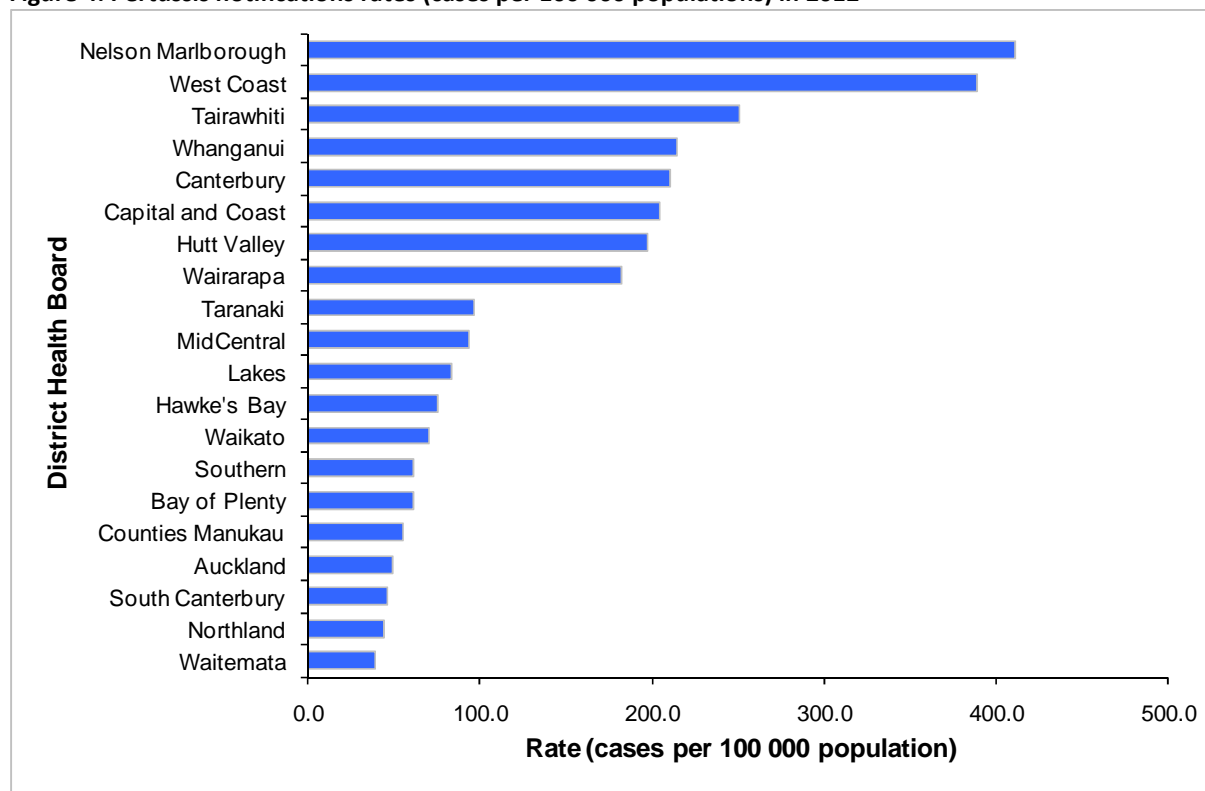
Hospitalisations

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, 12 hospitalisations were recorded. There have been 243 hospitalisations reported in EpiSurv in 2012. One hundred and forty (57.6%) of these were infants aged less than one year including 34 cases aged less than six weeks. Of the 4222 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (23.7%, 37/156), Māori (13.5%, 80/592), Other (7.1%, 11/155), and European (3.4%, 112/3319).

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 (75 cases), Capital and Coast (29 cases) and Waikato (21 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (411.0 per 100 000, 575 cases), followed by West Coast (388.3 per 100 000, 128 cases) and Tairāwhiti (251.1 per 100 000, 117 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (1056 cases), followed by Capital and Coast (602), Nelson Marlborough (575), Hutt Valley (285) and Counties Manukau (275) 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 159 confirmed cases reported in the last two weeks, 98 (61.6%) had a known vaccination status. Of these 98 cases, 41 were not vaccinated. One case had received one dose of vaccine, five cases had received three doses, two cases had received four doses, and four cases reported having completed pertussis vaccination. A further 45 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 9 November)

Age Group	Total cases	One dose	Two doses	Three doses	Four doses	Five doses	Vaccinated		
							(no dose info)	Not vaccinated	Unknown
<6wks	1	0	0	0	0	0	0	1	0
6wks - 2mths	4	0	0	0	0	0	3	1	0
3-4 mths	3	0	0	0	0	0	1	2	0
5mths - 3yrs	28	0	0	1	0	0	15	9	3
4 - 10yrs	40	0	0	4	2	1	15	10	8
11+ yrs	83	1	0	0	0	3	11	18	50
Unknown	0	0	0	0	0	0	0	0	0
Total	159	1	0	5	2	4	45	41	61

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 2009 confirmed cases with known age reported during 2012, 1326 (66.0%) had a known vaccination status (Table 4). Of these 1326 cases, 477 were not vaccinated, including 18 cases aged less than 6 weeks and thus not eligible for vaccination. One hundred and eight cases had received one dose of vaccine, 32 cases had received two doses, 182 cases had received three doses, 172 cases had received four doses, and 103 cases reported having completed pertussis vaccination. A further 252 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	21	0	0	0	0	0	0	18	3
6wks - 2mths	68	38	1	0	0	0	2	22	5
3-4 mths	34	6	13	0	0	0	0	14	1
5mths - 3yrs	334	5	10	137	30	1	19	100	32
4 - 10yrs	503	9	4	32	121	66	71	148	52
11+ yrs	1049	50	4	13	21	36	160	175	590
Unknown	0	0	0	0	0	0	0	0	0
Total	2009	108	32	182	172	103	252	477	683

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	69	43.6	6	4	0	0	0
Waitemata	214	39.2	18	18	12	0	1
Auckland	226	49.5	19	24	5	1	0
Counties Manukau	275	55.0	38	45	11	1	3
Waikato	259	70.4	17	14	21	2	0
Lakes	86	83.5	13	11	4	0	1
Bay of Plenty	130	61.4	7	3	11	1	0
Tairāwhiti	117	251.1	14	4	7	1	0
Taranaki	106	96.5	5	7	19	0	1
Hawke's Bay	118	75.7	11	6	5	1	0
Whanganui	135	214.0	16	12	7	1	0
MidCentral	158	93.9	12	8	13	2	1
Hutt Valley	285	197.2	13	5	16	3	1
Capital and Coast	602	204.3	29	9	29	0	0
Wairarapa	74	182.4	5	10	11	0	0
Nelson Marlborough	575	411.0	32	8	10	0	0
West Coast	128	388.3	3	2	2	0	0
Canterbury	1056	210.1	45	32	75	4	3
South Canterbury	26	46.1	0	2	0	0	0
Southern	189	61.7	22	19	20	0	1
Total	4828	109.6	325	243	278	17	12

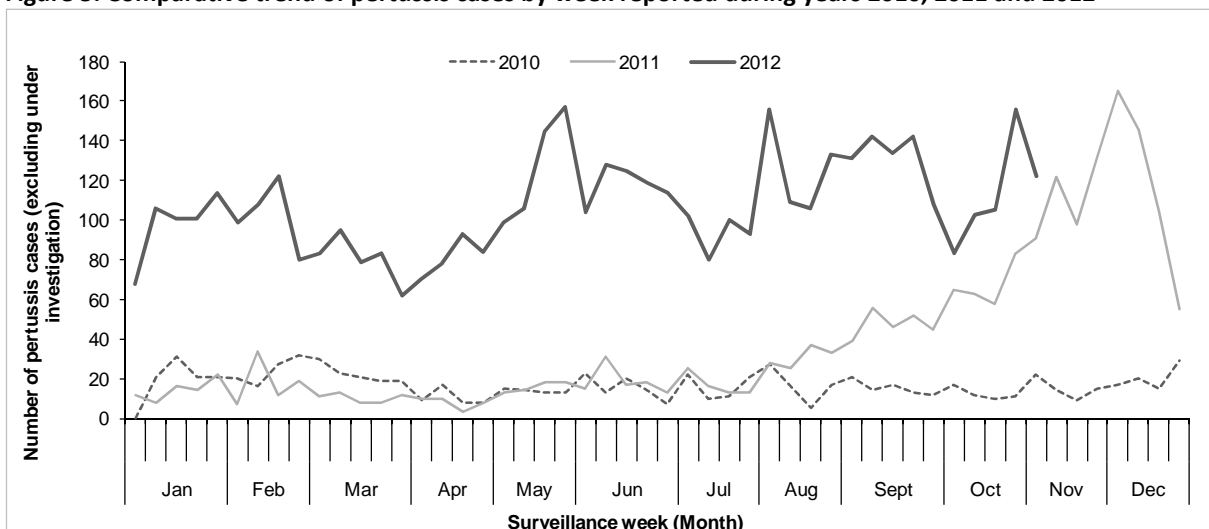
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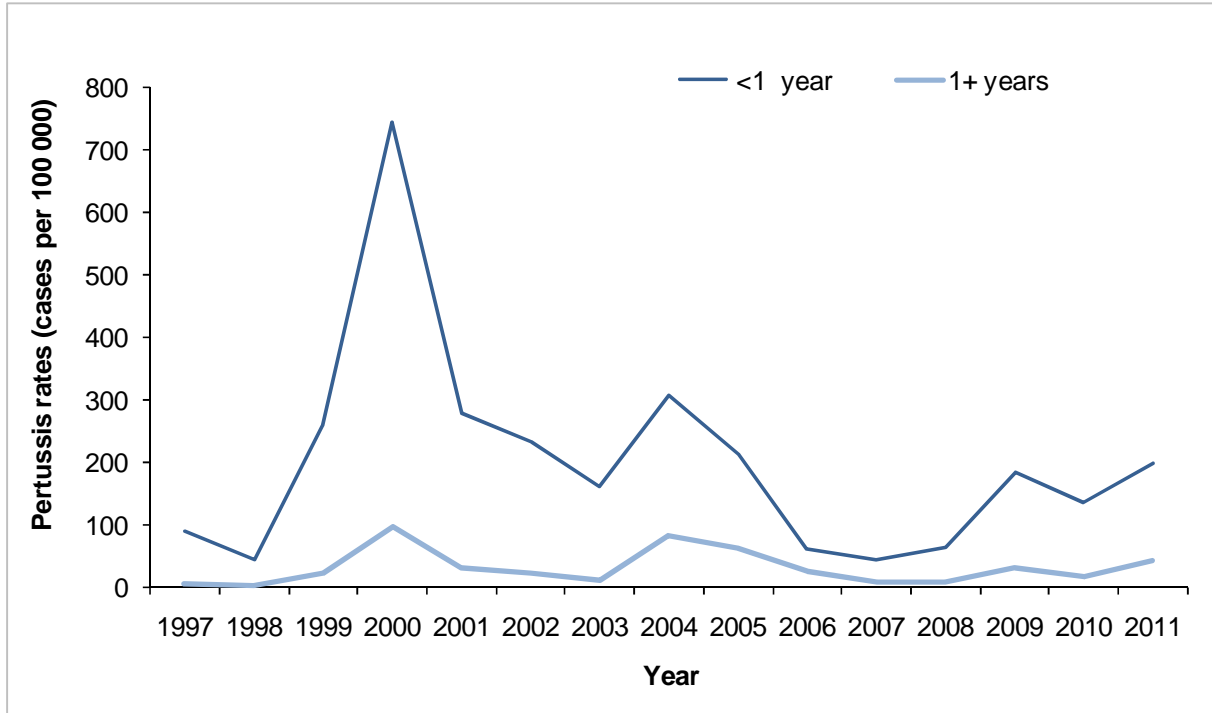
*Cases in the less than 1 year age group

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



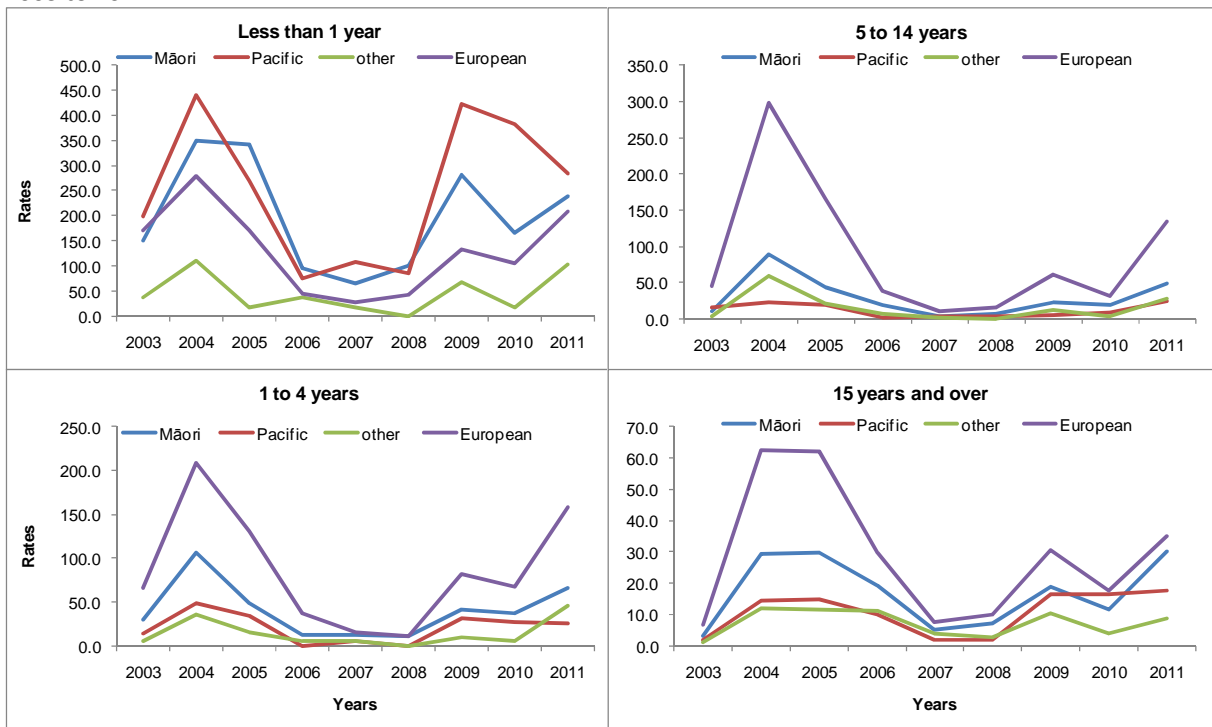
Note: Includes confirmed, probable and suspect cases only.

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

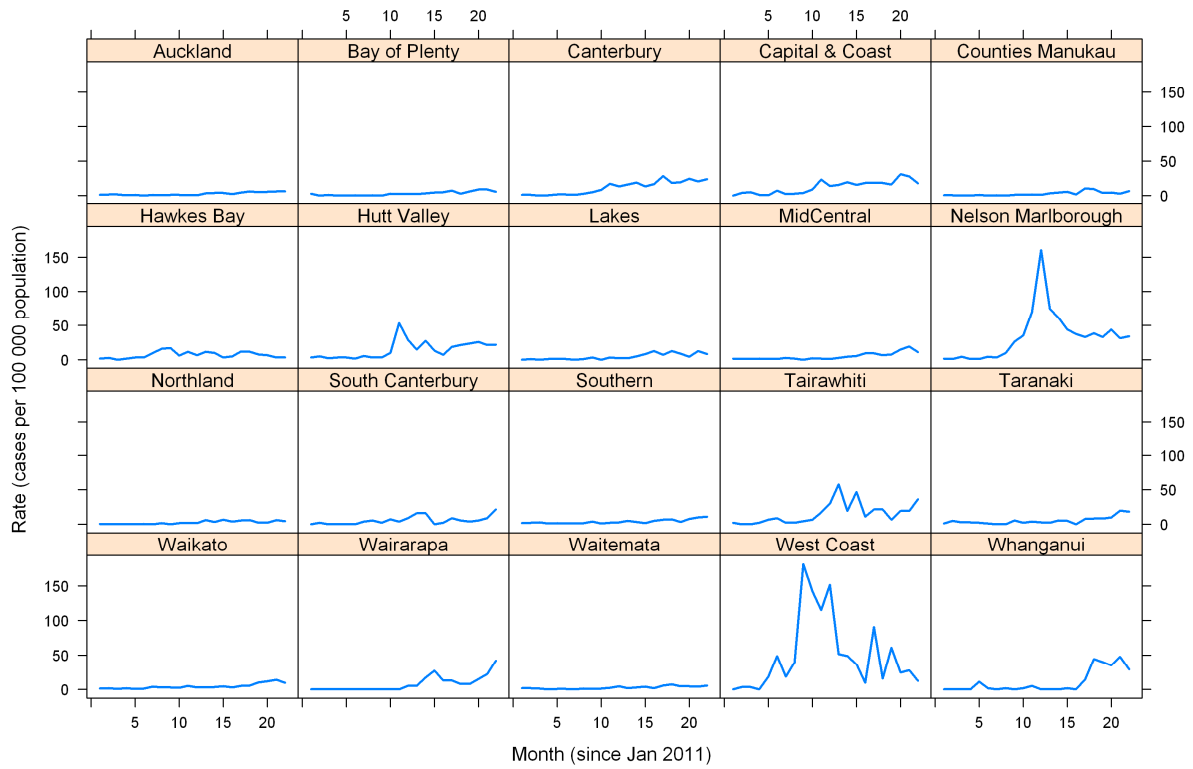
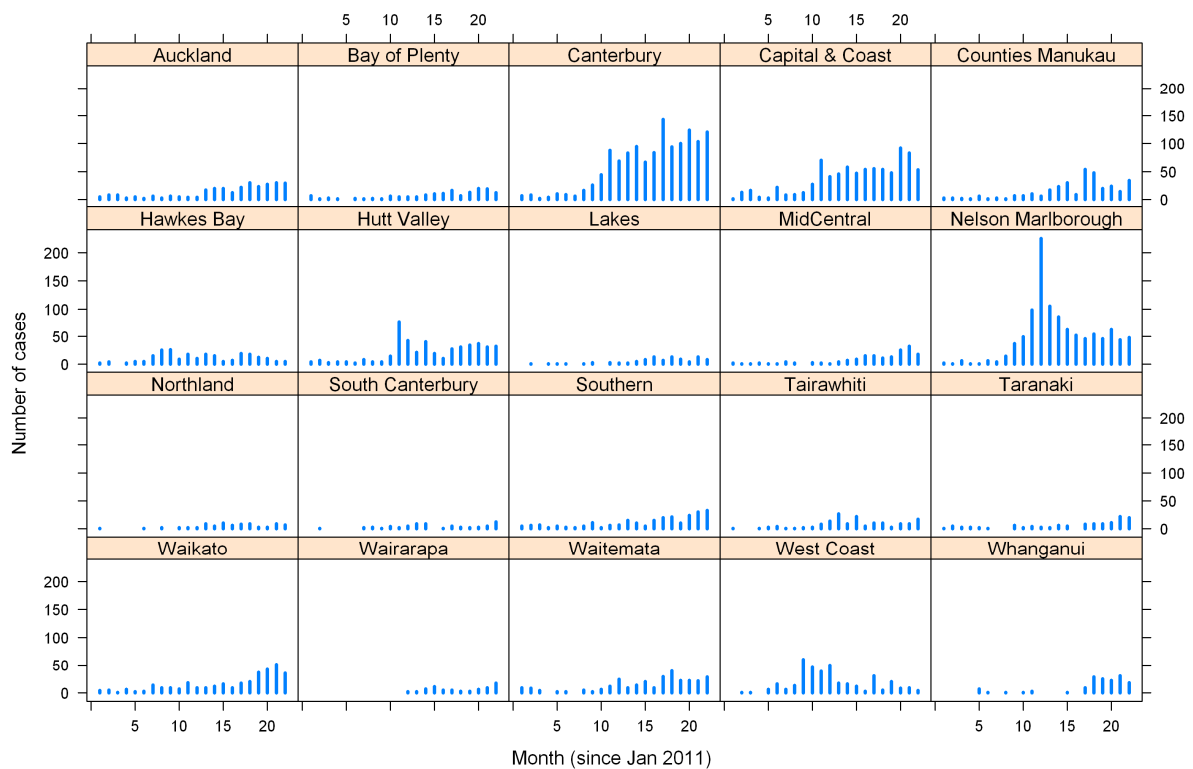


Figure 9: Monthly pertussis cases by DHB, since January 2011



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>.