

# PERTUSSIS REPORT

## April 2012

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This report includes cases of pertussis reported in EpiSurv up to midnight 13 April 2012. Data were extracted from EpiSurv at 10.00 am 17 April 2012.

### Summary

In the past two surveillance weeks (31 Mar – 13 Apr 2012), 138 new cases of pertussis (58 and 80 cases, respectively) were notified, including 36 confirmed cases, 63 probable cases, six suspect cases, and 33 cases still under investigation. These numbers have decreased compared to the numbers reported over the previous two weeks (166 cases). Seventeen (12.3%) of the notified cases were aged less than 1 year. Nine cases were hospitalised.

There has been a total of 1384 pertussis notifications reported in EpiSurv since the first surveillance week of 2012 (compared to 220 over the same period in 2011), including 576 confirmed cases, 710 probable cases, 36 suspect cases, and 62 cases still under investigation. 103 (7.4%) of the notified cases were in the less than 1 year age group. 63 hospitalisations and no deaths have been reported during this period.

In the last two weeks, the highest number of cases (excluding cases under investigation) was reported in Canterbury (28 cases), Capital and Coast (18 cases), and Nelson Marlborough (14 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (185.1 per 100 000, 259 cases), followed by West Coast (139.6 per 100 000, 46 cases) and Tairāwhiti (122.3 per 100 000, 57 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (271 cases), followed by Nelson Marlborough (259 cases), Capital and Coast (169), Hutt Valley (85) and Counties Manukau (72) DHBs

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.

## Temporal distribution of pertussis cases

Figure 1 shows weekly total pertussis notifications for 2010, 2011 and 2012 (to week ending 13 April). 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 rising more or less consistently. There has been a decreasing trend in weekly notifications since week 8. Note the total number of notifications may change as cases are investigated further and some are found not to meet the case definition. No deaths have 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: Comparative trend of pertussis notifications by week reported during years 2010, 2011 and 2012**

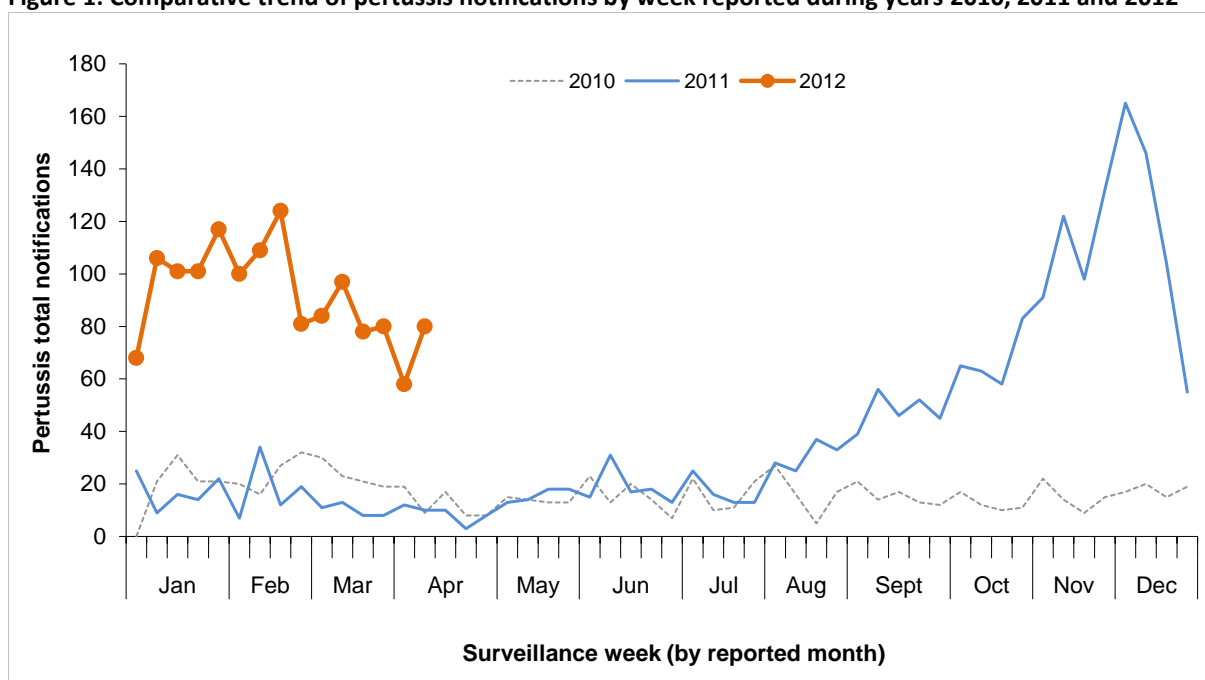
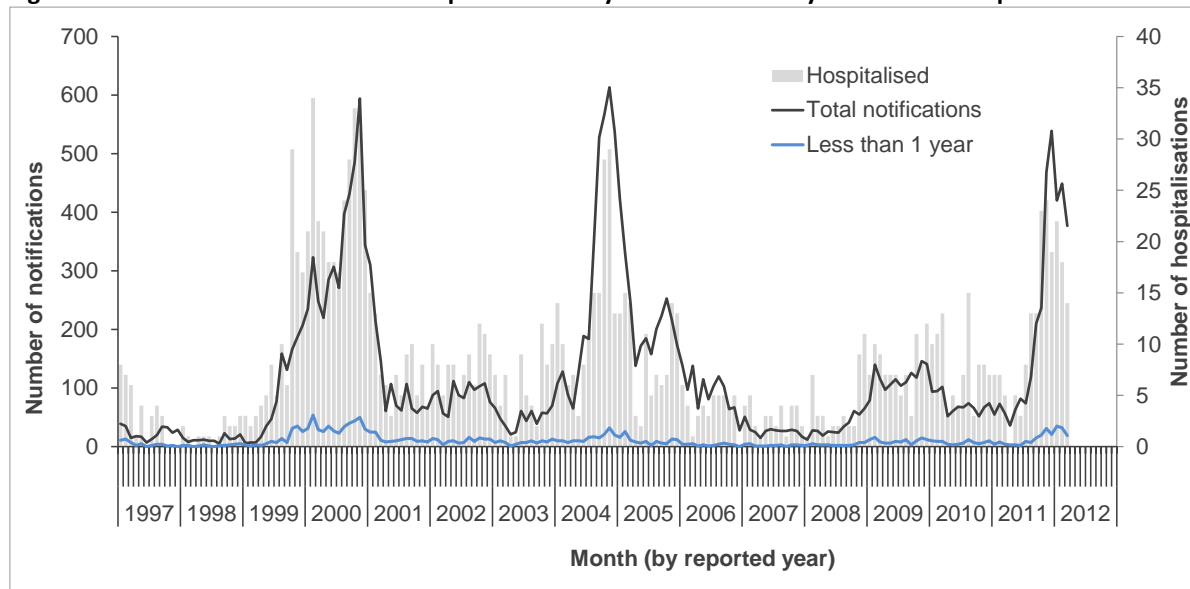


Figure 2 shows pertussis notifications and hospitalisations by calendar month, and notifications in those aged less than 1 year between 1 January 1997 and 31 March 2012. A four to five-year cycle can be seen with large peaks in notifications in years 2000 and 2004 and a much smaller peak in 2009. However, 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 March 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 (160.3 per 100 000 population, 100 cases), followed by the 1 to 4 years (95.7 per 100 000, 241 cases), and 5 to 9 years (53.3 per 100 000, 153 cases) age groups. Of the 1322 cumulative cases with known age, 12 (0.9%) 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<sup>1</sup> by age group in 2012, and new cases in the last two weeks**

| Age group (Years) | Cumulative <sup>2</sup> notifications |                    |           | Last two weeks <sup>3</sup> |          |
|-------------------|---------------------------------------|--------------------|-----------|-----------------------------|----------|
|                   | All cases                             | Rates <sup>1</sup> | Hosp      | New Cases                   | Hosp     |
| <1                | 100                                   | 160.3              | 36        | 15                          | 5        |
| 1 to 4            | 241                                   | 95.7               | 4         | 12                          | 0        |
| 5 to 9            | 153                                   | 53.3               | 3         | 14                          | 1        |
| 10 to 14          | 102                                   | 34.8               | 1         | 8                           | 1        |
| 15 to 19          | 61                                    | 19.2               | 1         | 7                           | 0        |
| 20 to 29          | 109                                   | 17.6               | 1         | 8                           | 0        |
| 30 to 39          | 152                                   | 27.0               | 4         | 8                           | 0        |
| 40 to 49          | 175                                   | 27.7               | 3         | 10                          | 0        |
| 50 to 59          | 104                                   | 18.7               | 5         | 13                          | 0        |
| 60 to 69          | 65                                    | 15.6               | 1         | 8                           | 0        |
| 70+               | 60                                    | 14.7               | 1         | 2                           | 0        |
| Unknown           | 0                                     |                    | 0         | 0                           | 0        |
| <b>Overall</b>    | <b>1322</b>                           | <b>30.0</b>        | <b>60</b> | <b>105</b>                  | <b>7</b> |

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

<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 31 March and 13 April 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 (62 cases), followed by Māori (19 cases). Of the cases in 2012, the ethnic-specific cumulative rates were highest for the European ethnic group (35.7 per 100 000, 961 cases), followed by Māori (27.2 per 100 000, 154 cases) and Pacific Peoples (17.7 per 100 000, 40 cases). Figure 3 shows European ethnic group had the highest rates across all age groups, followed by Māori. The ethnic distribution of cases in the under 1 year age group is also shown below.

**Table 2: Pertussis cases and rates<sup>1</sup> by ethnicity (prioritised) in 2012, and new cases in the last two weeks**

| Ethnicity       | Cumulative <sup>2</sup> notifications |                    |           |            | Last two weeks <sup>3</sup> |          |           |
|-----------------|---------------------------------------|--------------------|-----------|------------|-----------------------------|----------|-----------|
|                 | All cases                             | Rates <sup>1</sup> | Hosp      | <1 year*   | New Cases                   | Hosp     | <1 year*  |
| Maori           | 154                                   | 27.2               | 18        | 25         | 19                          | 2        | 5         |
| Pacific Peoples | 40                                    | 17.7               | 8         | 9          | 5                           | 2        | 2         |
| Other           | 43                                    | 11.5               | 2         | 4          | 8                           | 1        | 1         |
| European        | 961                                   | 35.7               | 29        | 56         | 62                          | 2        | 7         |
| Unknown         | 124                                   |                    | 3         | 6          | 11                          | 0        | 0         |
| <b>Overall</b>  | <b>1322</b>                           | <b>32.8</b>        | <b>60</b> | <b>100</b> | <b>105</b>                  | <b>7</b> | <b>15</b> |

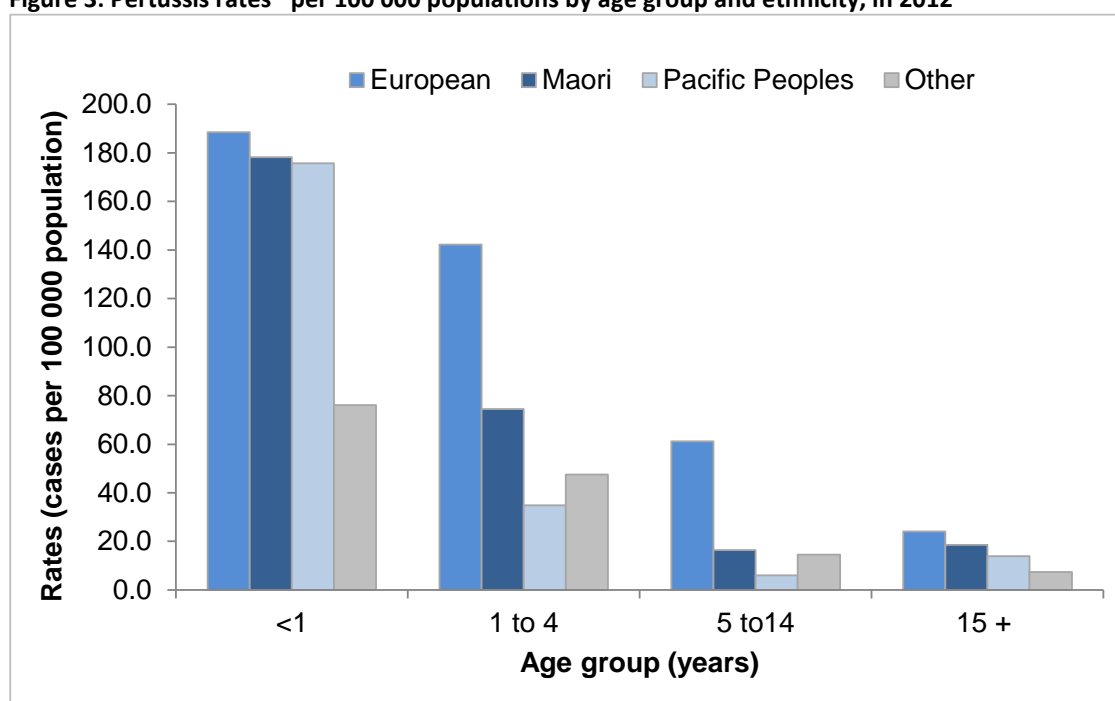
<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using Census 2006 usually resident populations.

<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 31 March and 13 April 2012 inclusive

\*Cases in the less than 1 year age group

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



Rate of pertussis cases per 100 000 population calculated using Census 2006 usually resident populations  
Rates calculated on fewer than five cases are unstable and should be interpreted with caution.

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. These rates have been highest among Pacific Peoples in the less than 1-year age group, while in other age groups rates have been highest in the European ethnic group. Note that these rates are for all notifications.

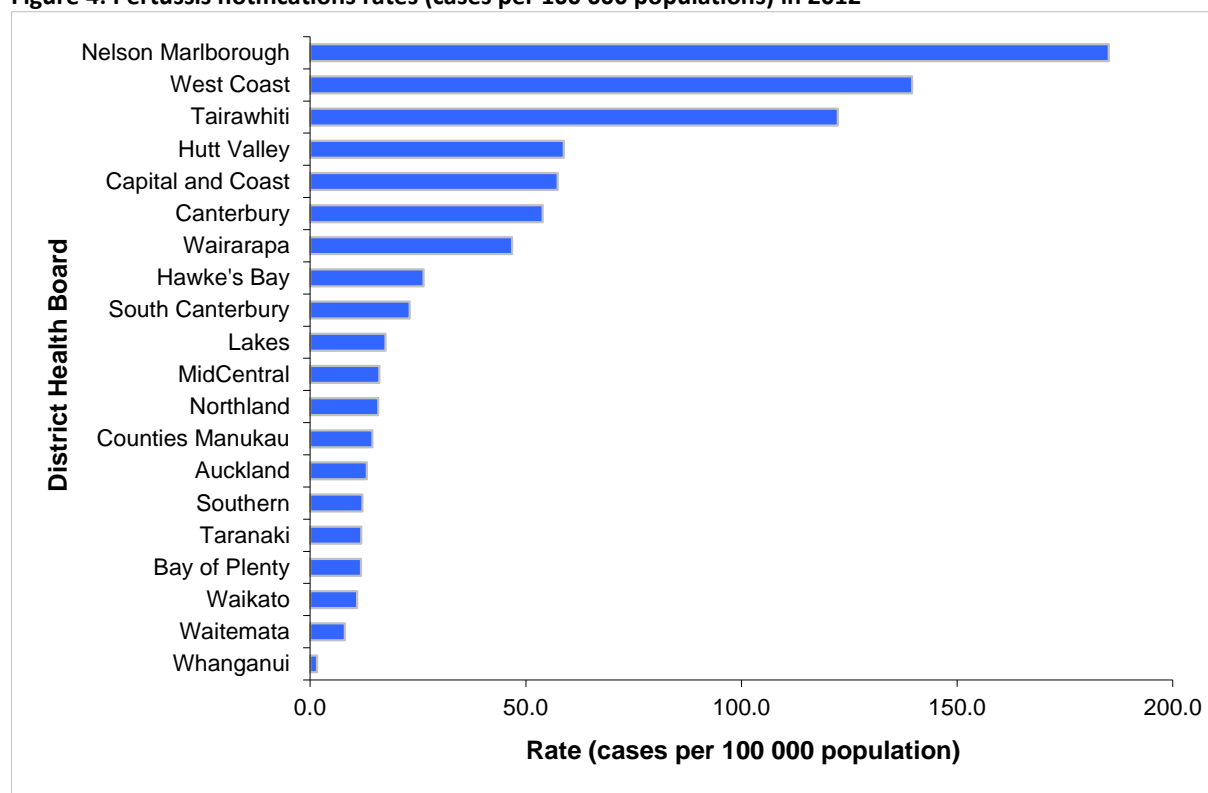
## Hospitalisations

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, seven hospitalisations were recorded. There have been 60 hospitalisations reported in EpiSurv in 2012. 36 (60.0%) of these were infants aged less than one year including 11 cases aged less than six weeks. Of the 1105 cases with known ethnicity and hospitalisation status, the ethnic-specific proportions of hospitalisations were as follows: Pacific Peoples (21.1%, 8/38), Māori (12.7%, 18/138), Other (5.4%, 2/37), and European (1.2%, 29/892).

## 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 (28 cases), Capital and Coast (18 cases), and Nelson Marlborough (14 cases) DHBs. The highest cumulative rate in 2012 was recorded in Nelson Marlborough (185.1 per 100 000, 259 cases), followed by West Coast (139.6 per 100 000, 46 cases) and Tairāwhiti (122.3 per 100 000, 57 cases) DHBs. The highest number of notifications was reported from Canterbury DHB (271 cases), followed by Nelson Marlborough (259 cases), Capital and Coast (169), Hutt Valley (85) and Counties Manukau (72) DHBs. Cases in the under 1 year age group by DHB are shown in Table 5 (appendix).

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



Rates were calculated using 2011 mid-year population estimates. Rates calculated on fewer than five cases are unstable and should be interpreted with caution (see Appendix for table).

## 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 36 confirmed cases reported in the last two weeks, 14 (38.9%) had a known vaccination status. Of these 14 cases, four were not vaccinated. Two cases had received one dose of vaccine, one case had received two doses, four cases had received three doses, and three had received four doses.

**Table 3: Immunisation status<sup>1</sup> of pertussis cases (confirmed) notified in the last two weeks (ending 13 April)**

| Age Group    | Total cases | One dose | Two doses | Three doses | Four doses | Five doses | Vaccinated     |                | Unknown |
|--------------|-------------|----------|-----------|-------------|------------|------------|----------------|----------------|---------|
|              |             |          |           |             |            |            | (no dose info) | Not vaccinated |         |
| <6wks        | 0           | 0        | 0         | 0           | 0          | 0          | 0              | 0              | 0       |
| 6wks - 2mths | 1           | 0        | 0         | 0           | 0          | 0          | 0              | 0              | 1       |
| 3-4 mths     | 1           | 1        | 0         | 0           | 0          | 0          | 0              | 0              | 0       |
| 5mths - 3yrs | 5           | 0        | 0         | 4           | 0          | 0          | 0              | 1              | 0       |
| 4 - 10yrs    | 7           | 0        | 0         | 0           | 3          | 0          | 0              | 2              | 2       |
| 11+ yrs      | 22          | 1        | 1         | 0           | 0          | 0          | 0              | 1              | 19      |
| Total        | 36          | 2        | 1         | 4           | 3          | 0          | 0              | 4              | 22      |

<sup>1</sup>Immunisation status has been extracted from Episurv notifications and is based on parental recall or Well Child book records only.

Of the 576 confirmed cases with known age reported during 2012, 388 (67.4%) had a known vaccination status (Table 4). Of these 388 cases, 134 were not vaccinated, including two cases aged less than 6 weeks and thus not eligible for vaccination. Thirty-six cases had received one dose of vaccine, seven cases had received two doses, 58 cases had received three doses, 50 cases had received four doses, and 31 cases reported having completed pertussis vaccination. A further 72 cases reported being vaccinated but no dose information was available.

**Table 4: Immunisation status<sup>1</sup> 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     |                | Unknown |
|--------------|-------------|----------|-----------|-------------|------------|------------|----------------|----------------|---------|
|              |             |          |           |             |            |            | (no dose info) | Not vaccinated |         |
| <6wks        | 4           | 0        | 0         | 0           | 0          | 0          | 0              | 2              | 2       |
| 6wks - 2mths | 12          | 7        | 0         | 0           | 0          | 0          | 0              | 4              | 1       |
| 3-4 mths     | 10          | 2        | 2         | 0           | 0          | 0          | 0              | 6              | 0       |
| 5mths - 3yrs | 121         | 1        | 4         | 46          | 15         | 0          | 11             | 31             | 13      |
| 4 - 10yrs    | 120         | 5        | 0         | 9           | 27         | 20         | 7              | 41             | 11      |
| 11+ yrs      | 309         | 21       | 1         | 3           | 8          | 11         | 54             | 50             | 161     |
| Total        | 576         | 36       | 7         | 58          | 50         | 31         | 72             | 134            | 188     |

<sup>1</sup>Immunisation status has been extracted from Episurv notifications and is based on parental recall or Well Child book records only.

## Appendix

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

| DHB                | Cumulative <sup>2</sup> notifications |                    |           |            | Last two weeks <sup>3</sup> |          |           |
|--------------------|---------------------------------------|--------------------|-----------|------------|-----------------------------|----------|-----------|
|                    | All cases                             | Rates <sup>1</sup> | Hosp      | <1 year*   | New Cases                   | Hosp     | <1 year*  |
| Northland          | 25                                    | 15.8               | 1         | 3          | 2                           | 1        | 1         |
| Waitemata          | 44                                    | 8.1                | 6         | 2          | 1                           | 0        | 0         |
| Auckland           | 60                                    | 13.1               | 6         | 7          | 3                           | 0        | 1         |
| Counties Manukau   | 72                                    | 14.4               | 13        | 16         | 2                           | 2        | 1         |
| Waikato            | 40                                    | 10.9               | 3         | 2          | 4                           | 0        | 0         |
| Lakes              | 18                                    | 17.5               | 0         | 1          | 3                           | 0        | 1         |
| Bay of Plenty      | 25                                    | 11.8               | 1         | 2          | 2                           | 0        | 0         |
| Tairāwhiti         | 57                                    | 122.3              | 1         | 5          | 0                           | 0        | 0         |
| Taranaki           | 13                                    | 11.8               | 0         | 0          | 0                           | 0        | 0         |
| Hawke's Bay        | 41                                    | 26.3               | 2         | 1          | 3                           | 0        | 0         |
| Whanganui          | 1                                     | 1.6                | 0         | 0          | 0                           | 0        | 0         |
| MidCentral         | 27                                    | 16.0               | 1         | 4          | 7                           | 0        | 0         |
| Hutt Valley        | 85                                    | 58.8               | 3         | 6          | 5                           | 0        | 0         |
| Capital and Coast  | 169                                   | 57.4               | 4         | 11         | 18                          | 1        | 3         |
| Wairarapa          | 19                                    | 46.8               | 3         | 3          | 5                           | 1        | 2         |
| Nelson Marlborough | 259                                   | 185.1              | 2         | 15         | 14                          | 0        | 1         |
| West Coast         | 46                                    | 139.6              | 1         | 2          | 1                           | 0        | 0         |
| Canterbury         | 271                                   | 53.9               | 6         | 11         | 28                          | 1        | 2         |
| South Canterbury   | 13                                    | 23.1               | 1         | 0          | 0                           | 0        | 0         |
| Southern           | 37                                    | 12.1               | 6         | 9          | 7                           | 1        | 3         |
| <b>Total</b>       | <b>1322</b>                           | <b>30.0</b>        | <b>60</b> | <b>100</b> | <b>105</b>                  | <b>7</b> | <b>15</b> |

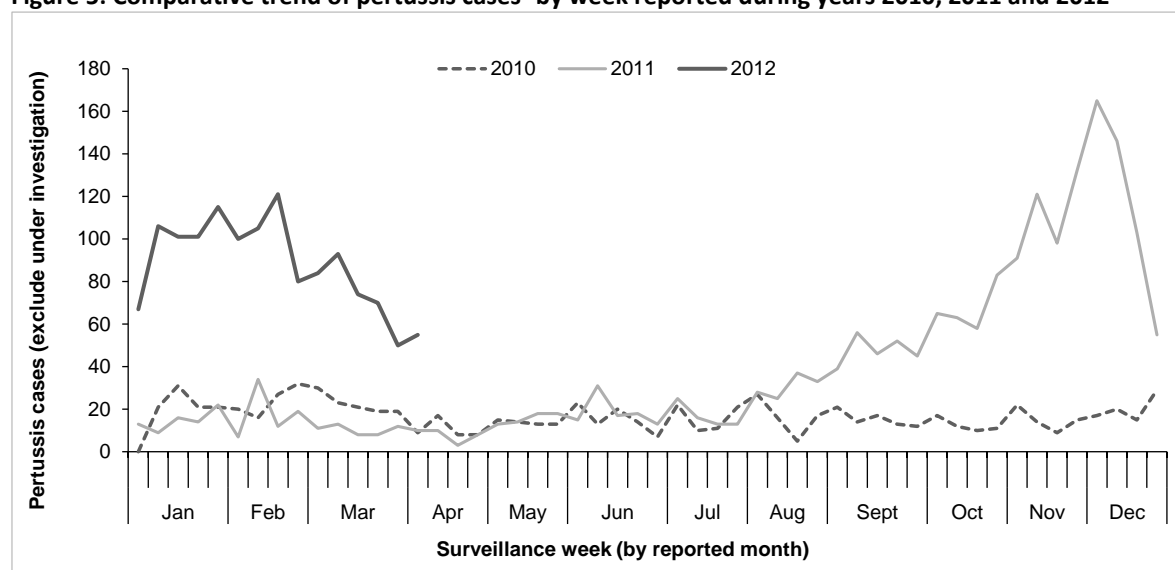
<sup>1</sup>Rate of pertussis cases per 100 000 population calculated using 2011 mid-year population estimates.

<sup>2</sup>Cumulative notifications (excluding cases under investigation) since 31 December 2011

<sup>3</sup>Notifications between 31 March and 13 April 2012 inclusive

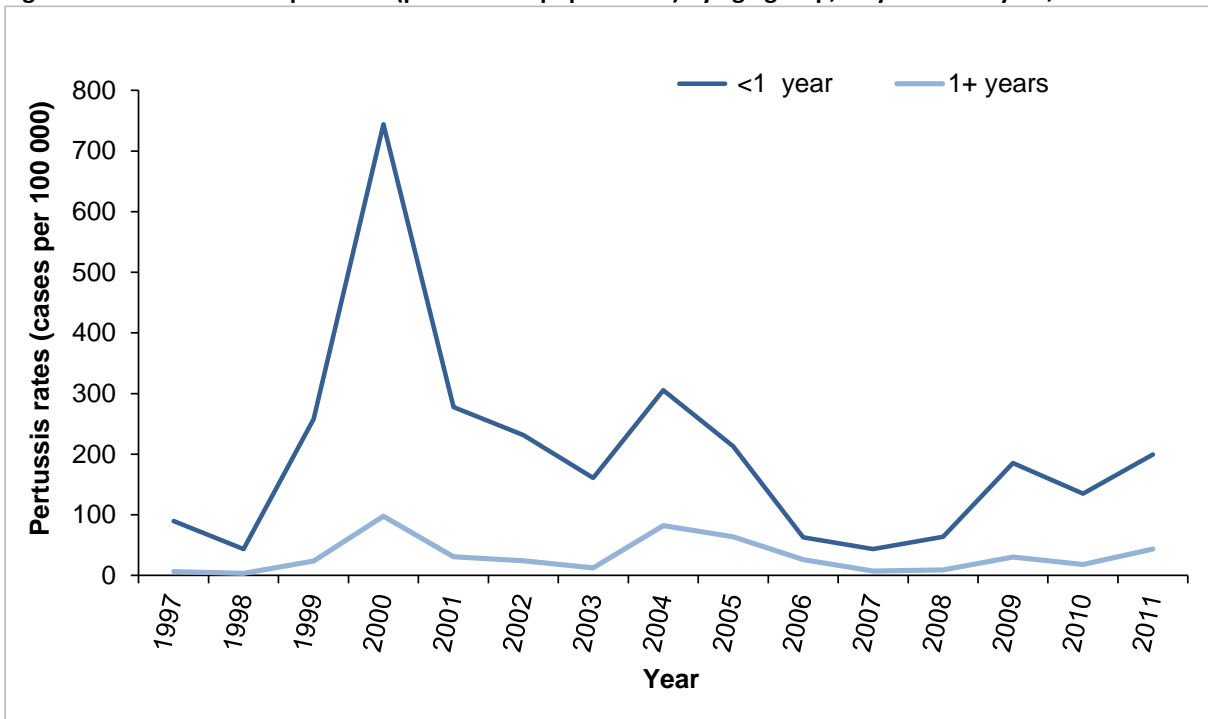
\*Cases in the less than 1 year age group

**Figure 5: Comparative trend of pertussis cases<sup>1</sup> by week reported during years 2010, 2011 and 2012**



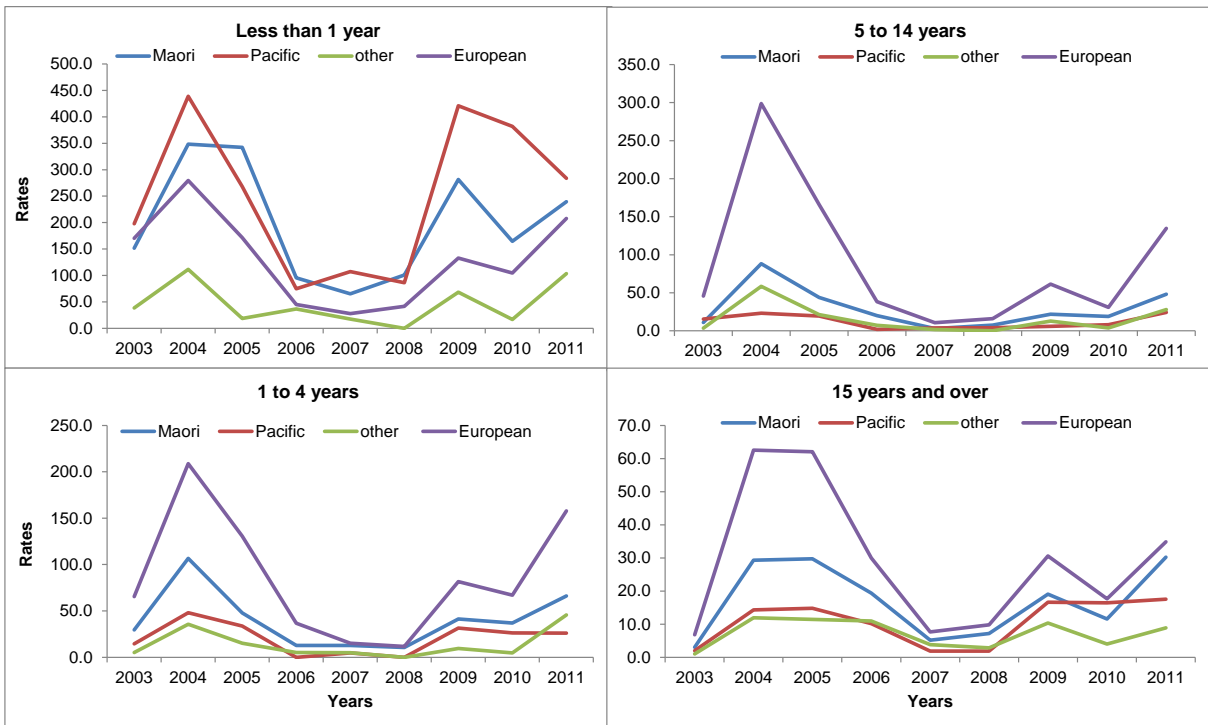
<sup>1</sup>Includes confirmed, probable and suspect cases only.

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



<sup>1</sup>Rate of pertussis notified cases per 100 000 population calculated using mid-year population estimates.

Figure 7: Trends in cumulative pertussis rates<sup>1</sup> (per 100 000 population) by age group and ethnicity, 2003 to 2011



<sup>1</sup>Rate of pertussis notified cases per 100 000 population (includes cases under investigation) calculated using mid-year population estimates



**Case classification for pertussis notification in New Zealand**

|                      |  |
|----------------------|--|
| <b>Confirmed</b>     | 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.  |
| <b>Probable</b>      | Cough lasting longer than two weeks and one or more of the following: <ul style="list-style-type: none"> <li>• Paroxysmal cough</li> <li>• Cough ending in vomiting or apnoea</li> <li>• Inspiratory whoop for which there is no other known cause.</li> </ul> |
| <b>Suspect</b>       | In children under five years of age any paroxysmal cough with whoop, vomiting or apnoea for which there is no other known cause.   |
| <b>Other</b>         | Status recorded as <i>under investigation</i> or suspect case.   |
| <b>Notifications</b> | Include confirmed cases, probable, and other as specified above.   |

This report will be available at: <http://www.surv.esr.cri.nz/surveillance/PertussisRpt.php>.