Author’s response to reviews

Title: Increasing incidence of pertussis in Brazil: a retrospective study using surveillance data

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Dear Editor,

We present below the specific answers to each of the requests of the reviewers.

1. There is no description of statistical analysis in the Method part. Please add accordingly to specify how the statistics are done in this paper.

Answer: We have added information on how the statistics were performed in the study, in Methods. "Descriptive statistics are presented, with the distribution of cases by month, year and state, as well as the frequencies of distinct diagnostic criteria used to confirm the cases. The mean incidence rates of pertussis incidence rates were calculated and presented. The frequencies of clinical complications in the cured group and in the group that evolved to death were compared with chi-square test. The confirmation rates in vaccinated and unvaccinated groups in distinct age strata were also compared using the chi-square test. Statistical significance was established at p < 0.05."

2. Throughout the manuscript, the authors used different terms for analysis, such as confirmation rate, case fatality rate, incidence rate, vaccine coverage rate (figure 8) and so on. Please clarify how these different terms are defined and calculated, and how many samples are used for each calculation.

We have added the following information: i) “Datasus calculates the immunization coverage rates as the number of children with complete basic scheme in the target age for a particular type of vaccine / number of children in the target age X 100”, ii) “Case fatality rates in different regions, years, and age groups were calculated as the number of deaths/number of confirmed cases X 100”, iii) “Confirmation rates were calculated as the number of confirmed cases (by any criteria) / number of notified (suspected) cases”, iv) “Population data from the Brazilian Institute of Geography and Statistics, available at www.ibge.gov.br, were used for calculation of
incidence rates as the number of pertussis confirmed (by any criteria) cases / population in a defined county-state-whole country in a specific year X 100,000 inhabitants.”

3. For Table 1, please clarify what the dividend and divisor are. Also please describe how the p value is calculated.

We added the information: “Table 1. Frequency of different complications in fatal and non-fatal pertussis cases in different age groups in Brazil, 2007-2014. The rates displayed are the number of children with the specific complication / total number of children in each category (cured or fatal cases). Comparison of proportions was performed with the chi-square test.”

4. In the abstract, the author mentioned "a significant increase in incidence since 2012". Supposedly, this means the "incidence rate". But this important dataset is not shown in the main text, page7, line41. Meanwhile, is Figure 3 based on incidence rate? If so, could it be supportive for that significant increase?

Yes, Figure 3 is based on incidence rate. We have included in the text that information about the increased incidence in 2012 is shown in Figure 3: “The annual evolution of pertussis incidence rates from 2007 to 2014 in the different Brazilian municipalities is shown in the maps in Figure 3. An increased incidence in many municipalities can be observed in 2012.”

5. In the last paragraph on page7, there are so many numbers that could hardly be tracked on any figure. Could the authors clarify how these numbers are generated? Are they based on Figure3?

They are actually the absolute number of cases in each state of Brazil, not being related to Figure 3. We've added this in the text.

6. The authors tried to compare different proportions of cases in different age groups in page8, paragraph2. Is it possible to add incidence rate for such comparison?

We agree with the need for this comparison. But unfortunately, we could not compare the incidence rates in different age groups because we do not have the exact size of the population stratified by months.

7. In general, the figure legend is too brief. Could the authors add some explanation on how the figure is generated in figure legend? Specifically, please explain what the x-axis is in Figure8.

We have improved the description of all the figures in their respective legends.
8. On page 5, line 54, please correct the unit for blood count. We replaced mm3 by µL.