Author's response to reviews

Title: The Epidemiology of Pertussis in Germany: Past and Present

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Author's response to reviews: see over
Dear Anastasios,

We thank the reviewers for the very constructive comments and suggestions they have made. We have highlighted the changes made and a detailed description of the changes made accordingly (which we have highlighted in the text) follows here:

Reviewer 1: Alberto Tozzi

Major compulsory revisions:

1. The background has been expanded by summing up determinants of the disease in the last sentence of the first paragraph.
2. The objective of the paper has been more explicitly stated as suggested by the reviewer.
3. A. These issues regarding susceptibility of individuals according to their history of natural disease, vaccination and natural boosting raised by the reviewer are discussed in the third last paragraph of the paper
3. B. We feel that we cannot go beyond the extent of our discussion on the duration of protection by type of vaccine in the fourth last paragraph of the paper as this would be highly speculative. Recent available sales data show that the various acellular vaccines on the market were all used everywhere with minimal regional differences, but we do not have comprehensive data for all regions and over time. Thus a discussion of whether some acellular vaccines might be better than others could only be highly speculative.
3. C. Underestimation of disease burden particularly in older, partially immune persons is now discussed in the fourth paragraph of the discussion in the context of the difference observed between incidence as estimated by active sentinel surveillance and routine surveillance data, now also specifically pointed out at the end of the results section.
3. D. Unfortunately, only limited data regarding differences in contact patterns between the two parts of Germany, either current or over time, are available. We have now briefly touched on one important difference, day care attendance, in the discussion, although an analysis of how this might affect pertussis epidemiology is beyond the scope of this paper.

4. A summary table summarizing key differences in vaccination recommendations, schedules, type of vaccine and background incidence in FEG and FWG has been added.

Minor essential revisions.

6. In the introduction, we now point out that disease may be milder in individuals previously immunized or those with previous pertussis in the past.

7. See Table 1 added as suggested in No. 4 above.

8. Laboratory diagnosis is ordered at the discretion of the patients’ physicians. This has been stated in the methods section (4th paragraph).

9. As the case definition does not stipulate a cut-off and as laboratories may use any commercially available test kit, cut-offs will vary according to what test is used. Therefore, we cannot specify the exact cut-off used for each reported case – only that the diagnosing laboratory interpreted the test results to be in keeping with an acute *Bordetella pertussis* infection. Commonly used tests in one FEG state as elicited in an outbreak investigation are now listed in the methods section (4th paragraph).

10. Use of sentinel surveillance is now mentioned in the methods.

Discretionary revisions
11. Immunizations registries are not available in Germany primarily due to data protection concerns. Pharmaceutical sales data from 2006 onwards have recently become available to RKI but do not allow an assessment of age at vaccination. Regional analysis does not reveal marked differences in the types of vaccines used according to region and also that all available vaccine types are used in all states. See also 3 B.

12. Hospitalization data pertained to principle diagnosis and mortality data to underlying cause of death only; this has been specified in the text in the methods section.

Reviewer 2 Pamela Rendi-Wagner

We have tried to improve the structure of the manuscript primarily in the discussion section (as we felt the results section was well-structured) primarily by eliminating redundancies and moving the discussion of limitations forward. However, due to the addition of reviewers’ suggestions the overall length was not reduced.

Minor specific comments:

1. The beginning of the abstract has been modified so as not to exclude FWG, also to incorporate the changes to the introduction of the paper
2. The abbreviation WH in the methods referred to the first author – this is dispensable and has been deleted.
3. Results: A summarizing table has been added, see also 4. above.
4. Discussion: The recommendations by the Global Pertussis Initiative have been mentioned

Other changes:

We have restructured the abstract according to the instructions for authors and added an authors’ contributions section.

As the Federal Statistical Office made mortality and hospital discharge data for 2006 and 2007 available in December 2008, these were incorporated into the analysis, as well as the figures and the text where appropriate. A data check revealed an error in the incidence calculation for 1-4 year old hospitalized children due to use of the wrong population denominator – this has been corrected. Due to this correction, differences between incidence of pertussis hospitalizations in older children in FEG versus FWG as well as between age groups were less pronounced, thus different age groups were chosen. It should be noted that this has also led to none of the figures being identical to those published in the German Epidemiologocal Bulletin in 2007.

On page 6 small errors in the denominator for the calculations regarding adequately vaccinated cases vaccinated < 3 years prior to illness in the section “Vaccination status of pertussis cases reported in former East German States, 2004-2007” have been corrected.

Kind regards

Wiebke Hellenbrand on behalf of all authors