

Incidence of pertussis among patients with prolonged cough visiting general practitioners in Poland, 2009-2010: a prospective enhanced surveillance study

Paweł Stefanoff,¹ Iwona Paradowska-Stankiewicz,¹ Małgorzata Głuchowska,¹ Waldemar Rastawicki,² Aleksandra Zasada,² Hanna Czajka,³ Richard Pebody⁴

1) Department of Epidemiology, National Institute of Public Health -PZH, Warsaw, Poland

2) Department of Bacteriology, National Institute of Public Health -PZH, Warsaw, Poland

3) Consultation Clinic for Vaccination of Risk Groups, Provincial Children's Hospital in Krakow, Krakow, Poland

4) Department of Immunisation, Health Protection Agency, Colindale, United Kingdom



Background and aims

- Pertussis cases are notifiable under the Polish law
- During the past two decades, the number of pertussis cases reported to national surveillance has increased (Fig. 1).
- Since 1997, more cases has been reported among older children and young adults.

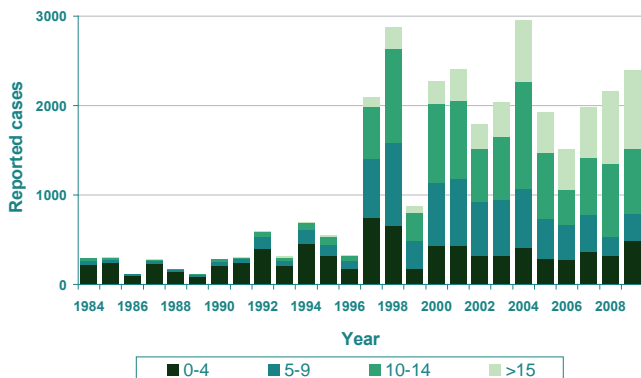


Figure 1. Number of pertussis cases by age group, Poland, 1984-2009

- The sensitivity of the pertussis reporting system has never been evaluated.
- The aim of the present study was to assess the incidence of pertussis among patients with cough lasting >2 weeks presenting to their general practitioner (GP), and to compare it with official pertussis notifications in Poland.

Methods

- **Study period:** from July 2009 until September 2010.
- **Study population:** 158,596 persons registered with 77 randomly selected general practitioners (154,019 person-years observation); The study population represented well the Polish population in terms of age and gender distribution, as well as their residence urbanization level.
- **Inclusion criteria:**
 - » age >3 years,
 - » cough lasting 2-15 weeks,
 - » informed consent.
- **Initial visit:**
 - » interview with each eligible patient,
 - » collection of a blood sample,
 - » a nasopharyngeal swab.
- **Follow-up visit after 30 days:**
 - » interview,
 - » collection of a second blood sample.
- **Pertussis case:** patient meeting the clinical criteria confirmed by laboratory investigation (specific antibody response or PCR).
- **Incidence of pertussis cases** referred to GPs was calculated by dividing the number of confirmed cases by the population served by GPs.
- **Underreporting factor (URF)** was calculated based on data obtained for study period

$$\text{URF} = \frac{\text{number of cases in the Polish community estimated during study}}{\text{number of cases reported to routine surveillance}}$$

Results

- During the study period, 2,724 patients with cough attended participating GPs, of whom 1,283 (47%) met the inclusion criteria and 830 (30%) were successfully recruited into the study.
- A total of 274 (33%) cases were confirmed as pertussis. A higher proportion of patients older than 40 years had confirmed pertussis (38%), compared to younger patients (28%) (Figure 2).

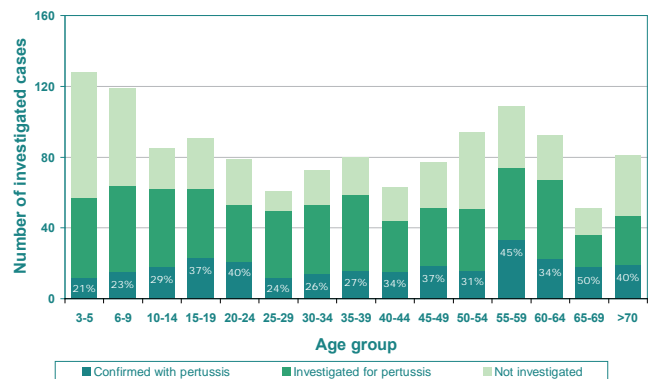


Figure 2. Number of patients meeting inclusion criteria, who were investigated and confirmed with pertussis, by age group, 77 GP practices, July 2009 - September 2010.

- The estimated incidence in the study population was 177.9 per 100,000 person-years, with important variability across age groups (Figure 3).

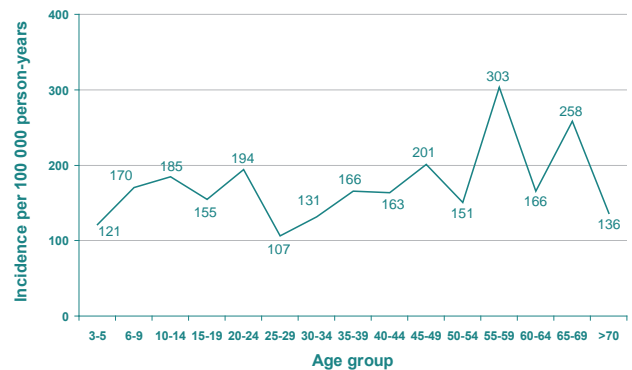


Figure 3. Age-specific incidence estimated in study population, 77 GP practices, July 2009 - September 2010.

- Extrapolating the incidence of pertussis in the study population to the national level, we estimated the annual number of GP-referred pertussis cases at 63,742.
- During the corresponding period, 896 pertussis cases were reported at national level.
- **URF was 71** (from 12 among 3-5 year olds, to 320 among 65-70 year olds) (Figure 4).

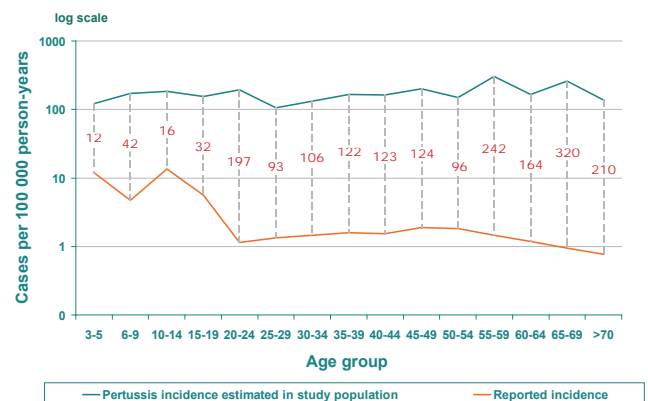


Figure 4. Comparison of age specific pertussis incidence estimated in the study population (green line) with the reported incidence (orange line), with listing of URFs for each age group, Poland, July 2009 - September 2010

Conclusions

- The present study confirms the high underreporting rate of pertussis cases seen by GPs in Poland.
- The preliminary results show that symptomatic pertussis infections are common among adults.
- Further work needs to be done to ascertain what role adult population may be playing in transmission to younger age-groups and maintaining the disease in the society.